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New records of mites (Acari: Parasitengona: Erythraeidae, Microtrombidiidae, Trombidiidae) from Albania, Montenegro and Serbia, with notes on *Erythraeus (Zaracarus) budapestensis* FAIN & RIPKA, 1998

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Abstract: *Erythraeus (Zaracarus) preciosus* GOLDARAZENA & ZHANG, 1998 syn. nov. and *E. (Z.) ueckermanni* SABOORI, NOWZARI & BAGHERI-ZENOUEZ, 2004 syn. nov. are considered synonyms of *E. (Z.) budapestensis* FAIN & RIPKA, 1998. This species indicates considerable variability of morphological characters between different populations originating from Europe and Asia. *Erythraeus (Z.) budapestensis* is new to the fauna of Albania, *Abrolophus wratislaviensis*, *Leptus (L.) eslamizadehi*, *L. (L.) molochinus*, *Atractothrombium sylvaticum*, *Camerotrombidium pexatum*, *Enemotrombium bifoliosum*, *Microtrombium pusillum*, *Platythrombium fasciatum*, *Allothrombium meridionale* and *Iranitrombium miandoabicum* are new for the fauna of Montenegro, *Abrolophus petanovicae* is new to the fauna of Serbia.

Key words: Erythraeidae, Microtrombidiidae, Trombidiidae, systematics, new synonyms, new records.

Introduction

In Montenegro mites belonging to terrestrial Parasitengona are inadequately known. However, 25 species were found: *Abrolophus kazimierae* HAITLINGER, 1986, *A. kotorensis* HAITLINGER, 2007, *A. norvegicus* (THOR, 1900) (= *Hauptmannia striata* SABOORI, ŠUNDIĆ & PEŠIĆ, 2011), *A. montenegrinus* SABOORI, ŠUNDIĆ & PEŠIĆ, 2012, *A. petanovicae* SABOORI, ŠUNDIĆ & PEŠIĆ, 2012, *A. quisquiliarius* (HERMANN, 1804), *Balaistium florale* GRANDJEAN, 1947, *B. medardi* HAITLINGER, 2000, *Charletonia bucephalia* BERON, 1974, *Erythraeus (Zaracarus) aydinicus* SABOORI, ÇAKMAK & NOURI-GONBALANI, 2004, *E. (Z.) budapestensis* FAIN & RIPKA, 1998, *E. (Erythraeus) ankaraicus* SABOORI, ÇOBANOĞLU & BAYRAM, 2004, *E. (E.) smolyanensis* HAITLINGER, 2009, *E. (E.) southcotti* GOLDARAZENA & ZHANG, 1998, *Moldoustium haitlingeri* NOEI, SABOORI & ŠUNDIĆ, 2013, *Marantelophus kamalii* SABOORI & ATAMEHR, 2000, *M. rudaensis* (HAITLINGER, 1986), *Leptus (L.) josifovi* BERON, 1975, *Arknotrombium arknesianum* HAITLINGER, 2007, *Parawenhoekia saedi* SABOORI & PEŠIĆ, 2008, *Allothrombium clavatum* SABOORI, PEŠIĆ & HAKIMITABAR, 2010, *A. pulvinum* EWING, 1917, *Montenegrotrombium milicae* SABOORI & PEŠIĆ, 2006, *Trombidium botovicum* HAITLINGER, 2004 and *Eutrombidium djordjevici* SABOORI & PEŠIĆ, 2006 (HAITLINGER

2007, 2012, SABOORI & PEŠIĆ 2006a, b, SABOORI et al. 2008, 2010, 2011, 2012, NOEI et al. 2013, ŠUNDIĆ & PAJOVIĆ 2012, 2013, ŠUNDIĆ 2014, HAITLINGER & ŠUNDIĆ (2014).

The fauna of mites of terrestrial Parasitengona in Serbia is very poorly known. Hitherto were found only 6 species: *Abrolophus quisquiliarus*, *A. stanislavae* HAITLINGER, 1986, *Allothrombium fuliginosum* (HERMANN, 1804), *Balaustium nikae* HAITLINGER, 1996, *Charletonia cardinalis* (C. L. KOCH, 1837) and *Erythraeus (Z.) budapestensis* (HAITLINGER 2007, 2012, ŠUNDIĆ 2014).

In Albania hitherto were known only four species: *Calyptostoma velutinum* (MÜLLER, 1776), *Erythraeus (E.) regalis* (C. L. KOCH, 1837), *E. (Z.) albanicus* HAITLINGER, 2012, *Leptus (Leptus) josifovi* BERON, 1975 and *Abrolophus kotorensis* HAITLINGER, 2007 (BERON 2008, HAITLINGER 2012).

In this paper *E. (Z.) budapestensis* is for the first time recorded in Albania, *Abrolophus wratislaviensis*, *Leptus (L.) eslamizadehi* SABOORI, 2002, *L. (L.) molochinus* (C. L. KOCH, 1837), *Atractothrombium sylvaticum* (C. L. KOCH, 1835), *Camerotrombidium pexatum* C. L. KOCH, 1937, *Enemotrombium bifoliosum* (CANESTRINI, 1884), *Microtrombium pusillum* (HERMANN, 1804), *Platyrombium fasciatum* (C. L. KOCH, 1836), *Allothrombium meridionale* BERLESE, 1910 and *Iranitrombium miandoabicum* SABOORI & HAJIQANBAR, 2003, are for the first time found in Montenegro, *Abrolophus petanovicae* is for the first time found in Serbia and *Erythraeus (Zaracarus) budapestensis* is for the first time found in Albania. Status of *E. (Z.) budapestensis*, *E. (Z.) preciosus* GOLDARAZENA & ZHANG and *E. (Z.) ueckermanni* SABOORI, NOWZARI & BAGHERI-ZENOUIZ is discussed.

Material and Methods

The specimens were collected by M. Šundić in May, June, July, August 2011, May, June 2012 and June 2013 in Montenegro, in Serbia and in Albania. Totally 139 larvae were obtained in Montenegro, 2 larvae in Albania and 3 larvae in Serbia, all from herbaceous plants. The specimens were collected by a sweep net and preserved in 70% ethanol. Mite specimens were cleared in Nesbitt's solution and mounted in Faure medium. All measurements are given in micrometers (µm) and calculated using a Carl Zeiss Axio Scope A1 microscope and Carl Zeiss Axio Imager A2 with differential interference contrast and phase contrast. The terminology of structures and setal notation follows SOUTHCOFF (1992) and HAITLINGER (1999).

Results

Family E r y t h r a e i d a e ROBINEAU-DESVOIDY, 1828

Abrolophus petanovicae SABOORI, ŠUNDIĆ & PEŠIĆ, 2012

M a t e r i a l e x a m i n e d : Serbia: Nova Varoš, 15 May 2013, 3 larvae.

This species was known only from Montenegro. First record from Serbia.

***A. wratislaviensis* HAITLINGER, 1986**

M a t e r i a l e x a m i n e d : Montenegro: Beri, 6 I, May 2012, Rijeka Crnojevici, 3I, May 2012, all from herbaceous plants.

This species is widely distributed in Europe. First record from Montenegro.

D i s t r i b u t i o n : Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Great Britain, Holland, Italy, Latvia, Lithuania, Luxembourg, Moldova, Norway, Poland, Romania, Russia, Slovenia, Sweden, Switzerland, Ukraine.

***Leptus (Leptus) eslamizadehi* SABOORI, 2002**

M a t e r i a l e x a m i n e d : Montenegro: Žabljak, Korita Kučka, 16-22 June 2011, 34 larvae.

Hitherto, this species was known the only from Iran (Saboori 2002). First record from Montenegro.

***Leptus (L.) molochinus* (C. L. KOCH, 1937)**

(= *L. (L.) ignotus* OUDEMANS, 1903)

M a t e r i a l e x a m i n e d : Montenegro: Korita Kučka, 22 July 2011, 2 larvae, Mokro, Žabljak, 25 June 2012, 38 larvae.

D i s t r i b u t i o n : Europe, Greenland. First record from Montenegro.

***Erythraeus (Z.) budapestensis* FAIN & RIPKA, 1998**

E. (Z.) hamedanicus KHANJANI, MIROMAYEDI NAHAD & FAYAZ, 2010 – synonymization doubtful

E. (Z.) preciosus GOLDARAZENA & ZHANG, 1998; **syn. nov.**

E. (Z.) ueckermanni SABOORI, NOWZARI & BAGHERI-ZENOUIZ, 2004; **syn. nov.**

M a t e r i a l e x a m i n e d : Montenegro: Plavnica, 25 May, 2011, 25 larvae, Bosnia: Gračanica, 25 June 2011, 1 larva; Albania 2 larvae, Skodra, 10 June 2013. First record from Albania.

When compared *E. (Z.) budapestensis* to other species known as larvae *E. (Z.) preciosus* and *E. (Z.) ueckermanni* have constituted the group of most similar taxa (Table 1). *E. (Z.) preciosus* was described based on differences with *E. (Z.) budapestensis* basing oneself on number of normal setae on tibia I-III (15-15-16) in *E. (Z.) budapestensis* and (14-15-14) in *E. (Z.) preciosus* (GOLDARAZENAA & ZHANG 1998). In key by SABOORI et al. (2004) and KHANJANI et al. (2010) is similarly (Ti I 15 vs. Ti I 14). Recently, differences in number of normal setae on tibiae II and III were used in key for *Erythraeus (Erythraeus)* by MAHMOUDI et al. (2014). Moreover, in two papers were given metric differences. However, metric data in both species not differs (Table 2). *E. (Z.) budapestensis* was described based on a single specimen (FAIN & RIPKA 1998). So, range of variability of fn Ti I-III was unknown. Based on specimens from Albania, Bulgaria, Croatia, Greece, Montenegro, Serbia and Turkey (n =47) we found distinct variability in leg tibial formula. Most often were found specimens with fn Ti I-III 14-14-15, 14-14-14 and 15-14-14. Moreover, also we found specimens with fn Ti I-III 15-15-15, 14-15-15, 14-15-14 and 15-15-14. fn Ti I-III for *E. (Z.) budapestensis* is 15-15-16, for *E. (Z.) preciosus* 14-15-14 and *E. (Z.) ueckermanni* 14-15-15. We have four specimens from Mallorca (Balearic Islands) and one specimen from continental Spain (*E. (Z.) preciosus*). In all these specimens fn Ti I-III is 14-14-15. This being so leg tibial formula, for

mentioned species have not diagnostic value. As a consequence *E. (Z.) preciosus* and *E. (Z.) ueckermanni* should be regarded as a synonyms of *E. (Z.) budapestensis*. Other species *E. (Z.) hamedamicus* was synonymized with *E. (E.) ueckermanni* by MAHMOUDI et al. (2011). They stated that all meristic characters and morphometric data as length of all segments of legs and length and width of scutum show no significant differences and shape of scutum is completely similar in both materials. However, in original description scutum of *E. (Z.) hamedamicus* and *E. (Z.) ueckermanni* differ in anterior and posterior border (in *E. (Z.) hamedamicus* both margins are distinctly concave vs. in *E. (Z.) ueckermanni* anterior margin is straight and posterior margin is slightly concave. Moreover, in *E. (Z.) hamedamicus* fV = 16 vs. fV = 8-12. In our materials shape of scutum is variable. Most often there were scutum elliptical, oval with straight anterior margin, slightly rounded anterior margin, part of then with slightly concave posterior margin and only three specimens with distinctly concave both margins (as in *E. (Z.) hamedamicus*). Number of setae behind coxae III oscillated between 8-12 (as in *E. (Z.) budapestensis*, *E. (Z.) preciosus* and *E. (Z.) ueckermanni*). It is the only feature differing *E. (Z.) hamedamicus* with the remaining species (three specimens in our collection bearing shape of scutum as in *E. (Z.) hamedamicus* have fV = 12). At present we not calling in question decision by MAHMOUDI et al. (2011) on the synonymization *E. (Z.) hamedamicus* with *E. (Z.) ueckermanni* (in result with *E. (Z.) budapestensis*) to assignation number of fV for more number of specimens from Iran.

Family Microtrombididae THOR, 1935

***Atractothrombium sylvaticum* (C. L. KOCH, 1835)**

Material examined: Montenegro: Plavnica, 25 May 2011, 1 larva.

Distribution: Europe. First record from Montenegro.

***Camerotrombidium pexatum* C. L. KOCH, 1837**

Material examined: Montenegro: Biogradska gora, 13 August 2011, 1 larva.

Distribution: Germany, Italy, Montenegro, Norway, Poland. First record from Montenegro.

***Enemotrombium bifoliosum* (CANESTRINI, 1884)**

Material examined: Montenegro: Grbavci, 15 June 2011, 1 larva.

Distribution: Czech Republic, Germany, Hungary, Italy, Montenegro, Norway, Poland, Romania, Spain. First record from Montenegro.

***Microtrombidium pusillum* (HERMANN, 1804)**

Material examined: Montenegro: Plavnica, 29 May 2012, 10 larvae.

Distribution: Europe. First record from Montenegro.

***Platyrombidium fasciatum* (C. L. KOCH, 1836)**

Material examined: Montenegro: Grbavci, 15 June 2011, 1 larva.

Distribution: France, Germany, Italy, Montenegro, Poland, Romania, Spain.
First record from Montenegro.

Family Trombidiidae LEACH, 1815

***Allothrombium meridionale* BERLESE, 1910**

Material examined: Montenegro: Bjelopavlići, 19-28 May 2011, 25 larvae.

Distribution: Europe, Kazakhstan. First record from Montenegro.

***Iranitrombium miandoabicum* SABOORI & HAJIQANBAR, 2003**

Material examined: Montenegro: Bjelopavlići, 15 June 2013, 11 larvae.

This species was known only from Iran (SABOORI et al. 2003). First record from Montenegro.

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Table 1. Metric data for *Erythraeus (Zaracarus) budapestensis* FAIN & RIPKA 1998 and synonymized species. H – holotype, 1 – *E. (Z.) hamedamicus*, (n = 2) 2 – *E. (Z.) preciosus* (n = 9), 3 – *E. (Z.) budapestensis* (Mallorca and continental Spain) (n = 5), 4 – *E. (Z.) ueckermanni* (n = 1), 5 – *E. (Z.) budapestensis* (Albania, Bulgaria, Croatia, Greece, Montenegro, Serbia, Turkey, Ukraine) (n = 47). Metric data for *E. (Z.) preciosus*, *E. (Z.) ueckermanni* and *E. (Z.) hamedamicus* were given by GOLDARAZENA & ZHANG (1998), SABOORI et al. (2004) and KHANJANI et al. (2010).

Character	H	1	2	3	4	5*	Range
IL		537-575		327-469	582	312-761	312-761
IW		350-354		223-383	400	225-664	223-664
L	96	85-88	81-94	89-101	87	85-116	81-116
W	150	138-140	115-150	127-143	133	125-162	115-162
AW	57	52-55	51-60	51-62	51	46-67	46-67
PW	116	106-108	96-116	100-115	102	101-127	96-127
AL	150	145-168	130-171	134-158	148	126-169	126-171
PL	60	63-68	45-66	55-66	53	53-74	45-74
ISD	45	47-48	27-48	45-48	43	38-56	27-56
AP	52		36-54	42-51	43	38-55	36-55
ASE	33	31-33	27-31	23-29	25	20-35	20-35
PSE	69	76-78	72-84	63-90	85	63-108	63-108
GL				132-161	131	132-169	131-169
DS	50-70	53-75		41-69	46-63	44-80	41-80
AA	30	20-28	24-36	30-36	29	22-40	20-40
SB	19	18-28	14-21	14-19	12	13-24	12-28
PsFd		38-40		39-50	46	30-58	30-58
PsGd				57-70	63	41-70	41-70
1a	70	63-65		60-80	>41	55-95	55-95
3a	33	43-45		30-40		29-45	29-45

Character	H	1	2	3	4	5*	Range
<i>Ib</i>	80	80-88		81-94	87	71-102	71-102
<i>2b</i>		30		27-33	32	23-46	23-46
<i>3b</i>		40-50		33-38	43	28-51	28-51
cs				24-33	32	25-37	24-37
as				30-44	50	41-52	30-52
OD				28-38		31-39	28-39
PaFe (L)				50-60		45-74	45-74
PaFe (W)				43-52		33-58	33-58
PaGe (L)				21-25		19-31	19-31
PaGe (W)				25-33		24-36	24-36
Ta I	100	110	81-102	85-106	97	85-114	81-114
Ti I	155	128-130	102-128	110-123	119	112-154	102-155
Ge I	116	100-105	75-94	80-96	90	86-114	75-116
Tf I		75	51-67	54-66	68	53-78	51-78
Bf I		75-78	45-75	64-75	80	68-91	45-91
Tr I		38-50	36-47	37-50	48	38-56	36-58
Cx I		65	51-69	50-62	56	50-72	50-72
Ta II	93	100	75-90	77-91	92	78-103	75-103
Ti II	160	130-133	99-135	110-123	121	105-158	99-160
Ge II	108	93-95	68-90	81-92	87	86-110	68-110
Tf II		73	53-66	49-64	65	55-84	49-84
Bf II		73-75	48-66	61-72	70	64-88	48-88
Tr II		40-50	44-51	42-51	48	40-62	40-62
Cx II		75	66-81	57-85	70	64-94	57-94
Ta III	105	120-123	90-114	101-116	114	90-137	90-137
Ti III	240	193-198	162-210	177-209	199	179-230	162-240
Ge III	128	108-113	72-111	98-110	107	97-134	72-134
Tf III		85	69-84	76-89	82	77-104	69-104
Bf III		90-96	60-81	81-92	97	81-111	60-111
Tr III		55-60	45-58	47-50	48	42-67	42-67
Cx III		83-88	72-84	70-82	73	65-91	65-91

* part from HAITLINGER (2004)