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A NEW SPECIES OF *HAUPTMANNIA* (ACARI: ERYTHRAEIDAE) FROM MONTENEGRO

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ABSTRACT — *Hauptmannia striata* Saboori, Šundić & Pešić, **n. sp.** is described and illustrated from larvae ectoparasitic on unidentified Collembola from Montenegro. It is the first report of the genus *Hauptmannia* and the fourth species of Erythraeidae found to be ectoparasitic on Collembola.

KEYWORDS — *Hauptmannia striata* Saboori, Šundić & Pešić, **n. sp.**; Collembola; ectoparasite; larva; new host; Montenegro

INTRODUCTION

The larvae of the Erythraeidae are parasites of various arthropods, including insects and spiders whereas postlarval erythraeids are predators. Some erythraeids (e.g. *Balaustium* sp.) are important predators of different pests (e.g. *Zeiraphera diniana* Guénée, *Panonychus ulmi* (Koch)) (Gerson *et al*., 2003).

Fauna of terrestrial Parasitengona of Montenegro is poorly known. Only four species of the family Erythraeidae have been reported from Montenegro: *Erythraeus (Zaracarus) budapestensis* Fain and Ripka, 1998, *Erythraeus (Erythraeus) ankaraicus* Saboori, Çobanoğlu and Bayram, 2004, *Erythraeus (Zaracarus)* cf. *ueckermanni* Saboori, Nowzari and Bagheri-Zenouz, 2004, and *Hauptmannia kotorensis* Haitlinger, 2007 (Haitlinger 2007a; Saboori *et al.* 2008). Mites have been less commonly recorded with the order Collembola (Greenslade and Southcott 1980). Only three species of erythraeids have been reported as ectoparasite of Collembola: *Leptus (Leptus) southcotti* Beron, 1975, *Leptus (Leptus) trimaculatus* (Rossi, 1794), both on unidentified Collembola from Bulgaria and *Erythrites* sp. near *womersleyi* (Southcott, 1946) on *Corynephoria quadrimaculata* Womersley, 1942 and *Corynephoria* sp. from Australia (Southcott, 1946; Beron 1975, 2008; Greenslade and Southcott 1980). In this paper we describe the larva of *Hauptmannia striata* Saboori, Šundić & Pešić, **n. sp.** ectoparasitic on an unidentified Collembola from Podgorica, Montenegro.

MATERIALS AND METHODS

Collembola specimens were collected by a sweep net and preserved in 75% ethanol.

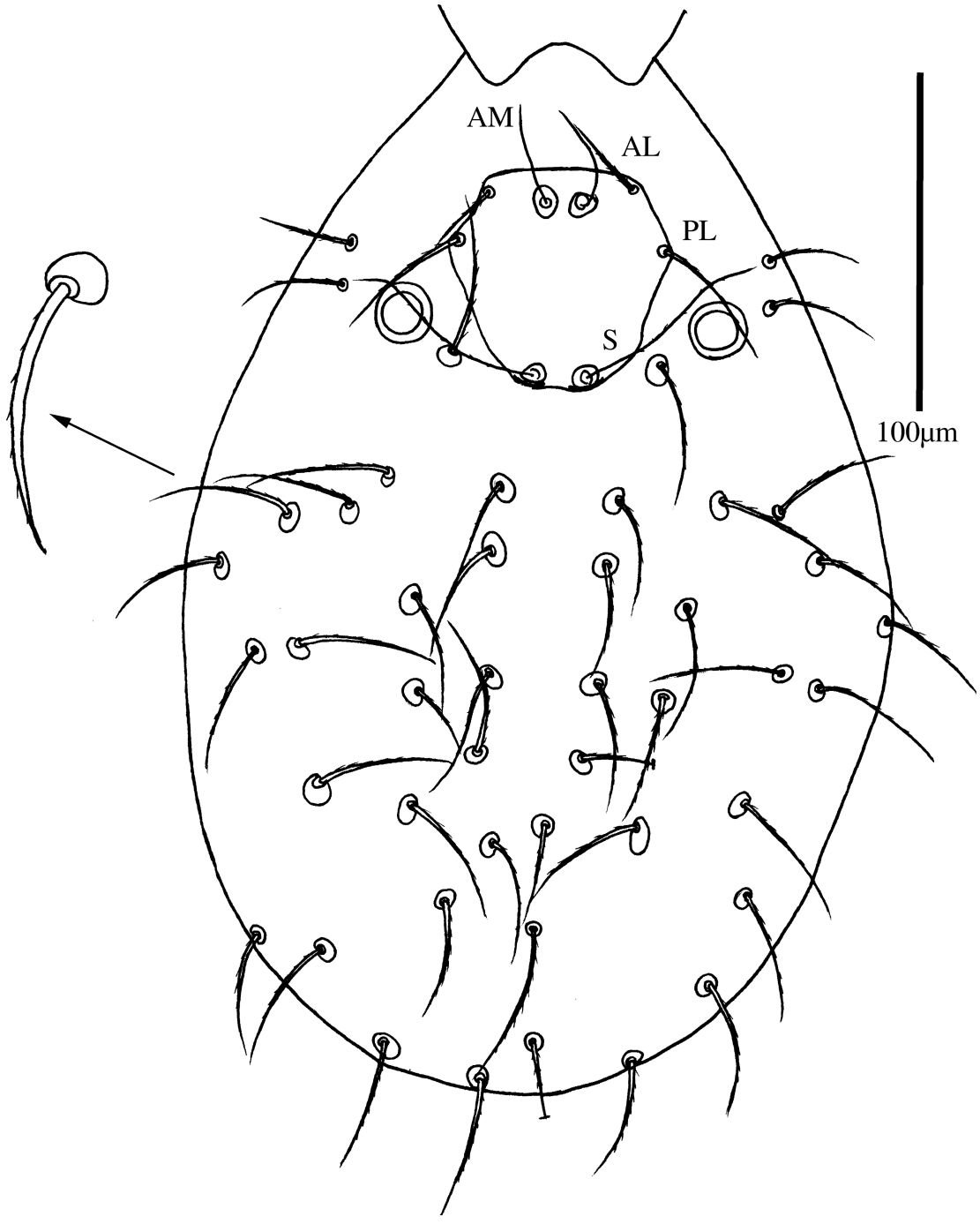

FIGURE 1: *Hauptmannia striata* Saboori, Šundić & Pešić, **n. sp.** (larva). Dorsal view of idiosoma.

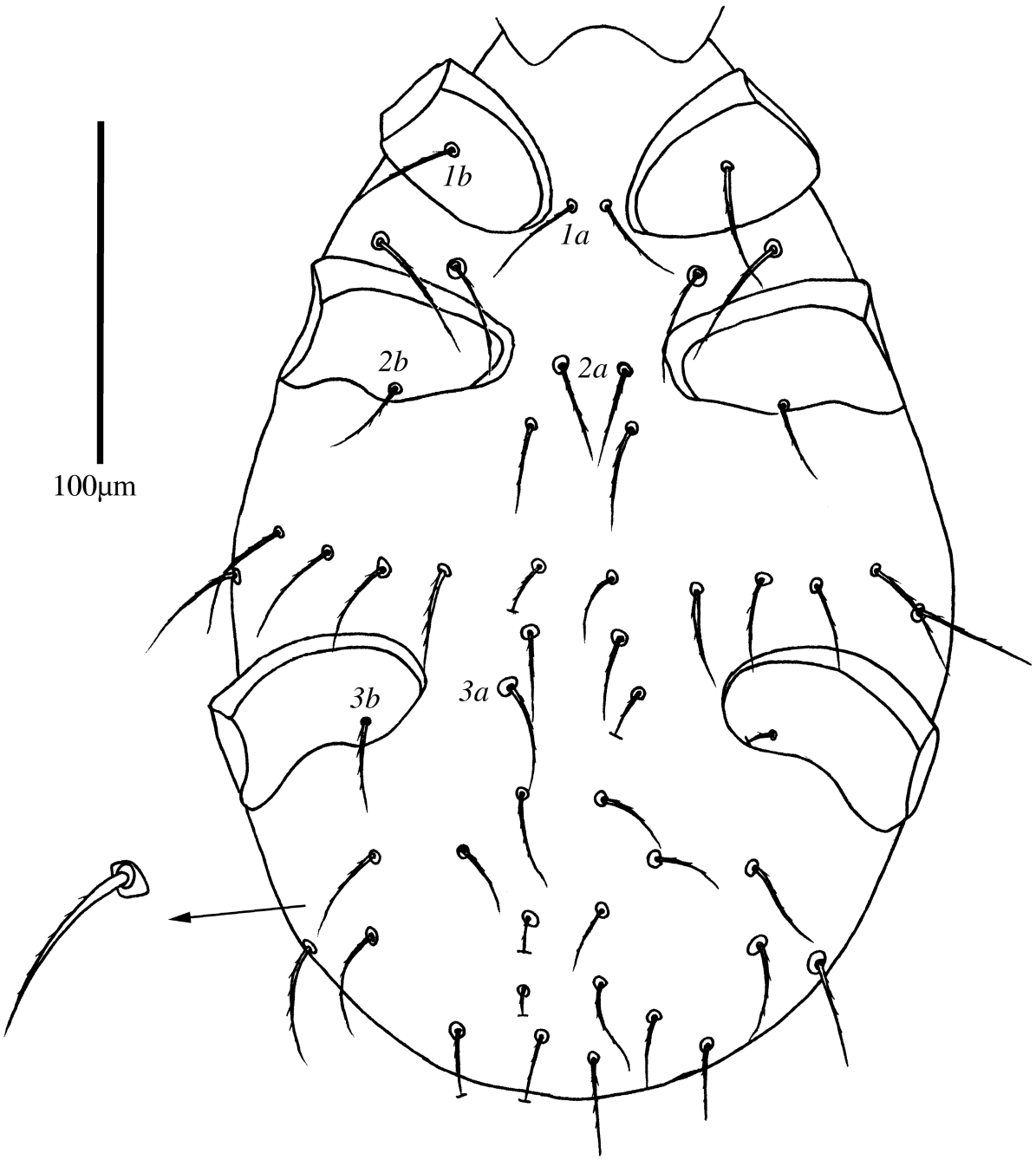

FIGURE 2: *Hauptmannia striata* Saboori, Šundić & Pešić, **n. sp.** (larva). Ventral view of idiosoma.

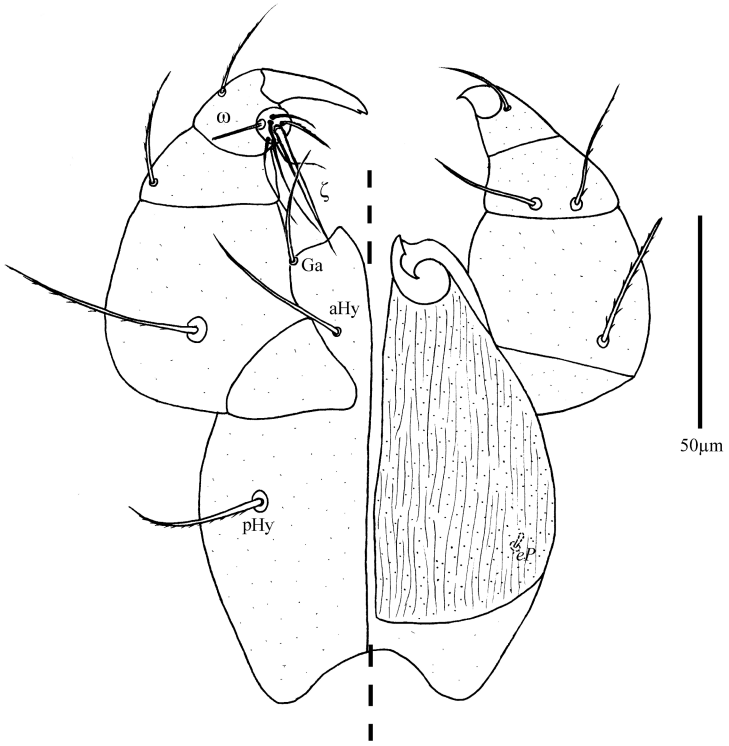

FIGURE 3: *Hauptmannia striata* Saboori, Šundić & Pešić, **n. sp.** (larva). Dorsal view (right) and ventral view (left) of gnathosoma.

Mite specimens were detached by an insect pin, cleared in Nessbitt's solution and mounted in Faure medium (Walter and Krantz 2009). Figures were drawn and measurements were calculated using a BX51 Olympus microscope equipped with a drawing tube and zoom lens.

The terminology and abbreviations follow Saboori *et al*. (2009) and all measurements are given in micrometers (µm).

FAMILY ERYTHRAEIDAE

Hauptmannia striata Saboori, Šundić & Pešić, n. sp. (Figs. 1 – 4)

Diagnosis

Palpal tibial claw bifid, palpal accessory claw entire, cheliceral bases striated and punctate, fn Ti 12-13-13.

Larva (Holotype) — Idiosoma oval, dorsal surface with 46 setae with fine barbs and on platelets (Fig. 1). Scutum length and width equal, scutum punctate with 2 pairs of scutalae; PL longer than AL; both with fine barbs. Anterior pair of sensilla (AM) very short and smooth; posterior pair of sensilla (S) with fine barbs throughout the length (Fig. 1). Each side of scutum with one eye, circular, not on platelets; eyes 15, ocular ring 20 across.

Ventral surface of idiosoma bearing 6 sternalae, 4 setae between coxae I and II, 16 barbed setae between coxae II and III and 19 setae behind coxae III. All ventral setae with fine barbs. Sternalae more or less equal in length. Coxae I–III each with one seta; coxala *1b* longer than other coxalae; coxala *2b* about as long as coxala *3b*; all coxalae barbed (Fig. 2). NDV = 46 + 39 = 85.

Gnathosoma with smooth galealae (Ga) and anterior hypostomalae (aHy) and barbed posterior hypostomalae (pHy) (Fig. 3). Palpal femur with 2 barbed and genu with 1 nude and 2 barbed setae (Fig. 3). Tibia with 1 barbed and 1 nude seta and an entire accessory claw.

TABLE 1: Metric data of *Hauptmannia striata* **n. sp.** larvae (a, holotype; b-d, paratypes).

Character	a	b	c	d	Character	a	b	c	d
IL	332	430	421	445	pHy	37	33	-	37
IW	111	208	215	238	Ga	35	31	30	27
SD	74	73	74	75	Ta I (L)	66	64	62	65
W	74	73	74	75	Ta I (H)	28	36	27	27
AW	46	52	48	50	Ti I	64	69	69	70
PW	64	66	64	65	Ge I	67	65	62	67
MA	17	17	18	17	TFe I	33	33	32	35
AA	12	10	12	15	BFe I	50	50	35	42
SB	17	19	17	18	Tr I	47	50	37	37
ISD	54	57	52	62	Cx I	60	59	52	57
AP	21	14	14	22	Leg I	387	390	349	373
AL	28	26	-	30	Ta II (L)	60	54	54	57
PL	46	45	42	47	Ta II (H)	25	25	27	26
AM	38	33	42	37	Ti II	64	62	62	67
S	63	50	59	61	Ge II	64	57	62	64
DS	41–48	31–46	30–47	30–47	TFe II	30	30	27	32
PDS	37–47	44–54	40–47	35–50	BFe II	41	42	32	37
1a	32	28	32	27	Tr II	42	45	47	50
1b	51	63	50	50	Cx II	77	67	62	69
2a	32	26	32	27	Leg II	378	357	346	376
2b	28	25	27	35	Ta III (L)	61	57	55	57
3a	30	26	27	30	Ta III (H)	22	25	25	22
3b	28	25	27	30	Ti III	90	89	89	97
GL	114	120	121	121	Ge III	75	74	74	79
PaScFed	33	32	39	-	TFe III	38	37	37	42
PaScFev	50	48	51	50	BFe III	45	28	45	42
$PaScGed_1$	32	30	37	35	Tr III	50	42	50	45
$PaScGed_2$	35	32	42	35	Cx III	71	69	62	67
PaScGev	25	27	27	27	Leg III	430	396	412	429
aHy	42	31	30	52	IP	1195	1143	1107	1178

Tarsus with 7 setae including one barbed and four nude normal setae, a solenidion and an eupathidium (Fig. 3). fPp = 0-BB-BBN-BNN2-BNNNN$\omega\zeta$. Palps and ventral gnathosoma with fine punctation. Cheliceral bases striated and punctate. Supracoxal seta of palp (*eP*) 5 long.

Leg segmentation formula: 7-7-7. Leg setal formula: Leg I: Ta- 1ω, 1ε, 2ζ, 1Cp, 24n; Ti- 2φ, 1κ, 12n; Ge- 1σ, 1κ, 11n; TFe- 8n; BFe- 4n; Tr- 2n; Cx- 1n (+ 1 *eP*) (Fig. 4A). Leg II: Ta- 1ω, 2ζ, 1Cp, 21n; Ti- 2φ, 13n; Ge- 1σ, 1κ, 9n; TFe- 5n; BFe- 4n; Tr- 2n; Cx- 1n (Fig. 4B). Leg III: Ta- 1ζ, 18n; Ti- 1φ, 13n; Ge- 1σ, 9n; TFe- 5n; BFe- 4n; Tr- 2n; Cx- 1n (Fig. 4C). All tarsi with two falciform claws and a claw-like empodium.

Measurements are given in Table 1.

Etymology

Name referring to the striations on cheliceral bases.

Type material

The holotype (ARS-20041115-1a) and paratype (ARS-20041115-1b, 1c, 1d) larvae were collected by A. Saboori, M. Šundić & Pešić, ectoparasitic on

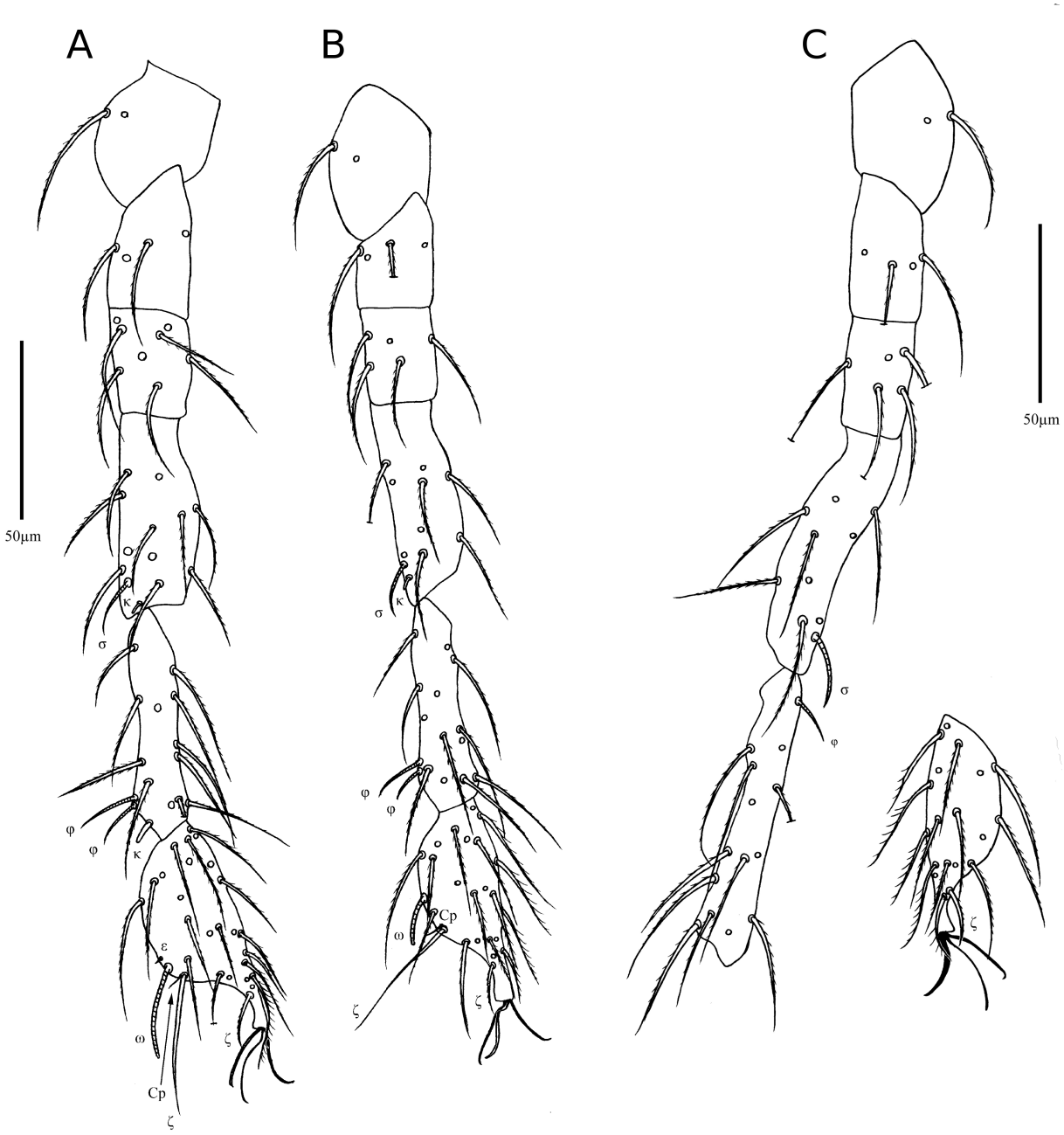

FIGURE 4: *Hauptmannia striata* Saboori, Šundić & Pešić, **n. sp.** (larva). A – Leg I, trochanter-tarsus; B – Leg II, trochanter – tarsus; C – Leg III, trochanter – tarsus.

unidentified Collembola, 8 August 2008, in Vranjske Njive (42° 28′ 06.96″ N 19° 15′ 28.10″ E), bank of Zeta River, Podgorica, Montenegro. The holotype and one paratype (ARS-20030611-1b) are deposited in the Acarological Collections, Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, Karaj, Iran and two paratypes are deposited in the Museum of the Natural History of Podgorica (Montenegro).

Remarks

It is the fourth species of Erythraeidae as ectoparasite of Collembola. *Hauptmannia striata* Saboori, Šundić & Pešić, **n. sp.** belongs to the species group of *Hauptmannia* with bifid palpal tibial claw (Haitlinger 2008a). There are seven species in this group as follows: *Hauptmannia stanislavae* Haitlinger, 1986, *H. silesiacus* Haitlinger, 1986, *H. viburnicola* Fain and Çobanoğlu, 1998, *H. yanlingica* Zheng, 2002, *H. sardiniensis* Haitlinger, 2007, *H. kotorensis* Haitlinger, 2007 and *H. podorasensis* Haitlinger 2007. It differs from all these species by striated and punctate cheliceral bases. Also, it differs from *H. stanislavae* by longer AW (46 – 52 vs. 34 – 40), PW (64 – 66 vs. 52 – 56), PL (42 – 47 vs. 24 – 30), AM (33 – 42 vs. 26 – 30), S (50 – 63 vs. 42 – 46), SD (72 – 75 vs. 62 – 66), W (73 – 75 vs. 58 – 62), Ti III (89 – 97 vs. 68 – 76) and palpal tibial accessory claw entire (vs. bifid in *H. stanislavae*), number of normal setae on Ti I (12 vs. 13), number of normal setae on TFe I (8 vs. 7), absence of microseta on Ti II (vs. present in *H. stanislavae*), fn Ta (24-21-18 vs. 23-19-19), from *H. silesiacus* by longer AM (33 – 42 vs. 20 – 34), number of dorsal idiosomal setae (fD) (46 vs. 53), number of ventral idiosomal setae (fV) (39 vs. 57) and NDV (85 vs. 110), presence of Cp on Ta I and II (vs. absent in *H. silesiacus*), presence of microseta on Ge I and II (vs. absent in *H. silesiacus*), presence of microseta on Ti I and II (vs. absent in *H. silesiacus*), number of normal setae on Ge II and III (9 vs. 8), number of normal setae on Ti II (13 vs. 11); from *H. viburnicola* in the number of normal setae on Ta III (17 vs. 20), longer W (73 – 75 vs. 54), PW (64 – 66 vs. 51), SB (17 – 19 vs. 12), Ta I (62 – 66 vs. 48), shorter AL (26 – 30 vs. 52), AP (14 – 22 vs. 27), Ti I (64 – 70 vs. 90), Ti II (64 – 67 vs. 80) and Ge I (62 – 67 vs. 80); from *H. yanlingica* in the number of normal setae on Ti I (12 vs. 15), Ti III (13 vs. 12), fD (46 vs. 126), fV (45 vs. 158), shorter SD (72 – 75 vs. 95), W (73 – 75 vs. 122), AW (46 – 52 vs. 83), PW (64 – 66 vs. 110), AL (26 – 30 vs. 73), PL (42 – 47 vs. 117), AM (33 – 42 vs. 61), *1b* (50 – 63 vs. 95), *3b* (25 – 30 vs. 55), leg I (373 – 390 vs. 606), leg II (346 – 378 vs. 582) and leg III (396 – 430 vs. 679); from *H. sardiniensis* by presence of Cp on Ta I and II (vs. absent in *H. sardiniensis*), presence of microseta on Ge I and II (vs. absent in *H. sardiniensis*), absence of microseta on Ti II (vs. present in *H. sardiniensis*), presence of eupathidium on Ta III (vs. absent in *H. sardiniensis*), presence of famulus on Ta II (vs. absent in *H. sardiniensis*), presence of solenidion on Ge III (vs. absent in *H. sardiniensis*), palpal tibial accessory claw entire (vs. bifid in *H. sardiniensis*), number of normal setae on Ge I (11 vs. 8), TFe I (8 vs. 7), Ge II (9 vs. 8), Ti III (13 vs. 12), Ge III (9 vs. 8), number of eupathidium on Ta II (2 vs. 1), longer AW (46 – 52 vs. 32), PW (64 – 66 vs. 42), AL (26 – 30 vs. 18), PL (42 – 47 vs. 30), AM (33 – 42 vs. 18), S (50 – 63 vs. 44), leg I (349 – 390 vs. 300), leg II (346 – 378 vs. 280), leg III (396 – 430 vs. 330) and IP (1107 – 1195 vs. 910) and from *H. kotorensis* by presence of Cp on Ta I and II (vs. absent in *H. kotorensis*), number of normal setae on BFe I-III (4 vs. 3), Ge II (9 vs. 10), Ge III (9 vs. 12), Ti II-III (13 vs. 12), presence of solenidion on Ge II (vs. absent in *H. kotorensis*), number of solenidion on Ti II (2 vs. 1), longer AW (46 – 52 vs. 36 – 38), PW (64 – 66 vs. 50 – 54), W (73 – 75 vs. 56 – 60), PL (42 – 47 vs. 32 – 34), AM (33 – 42 vs. 24 – 26), *1b* (50 – 63 vs. 36 – 40), Ti III (89 – 97 vs. 70 – 78), leg II (346 – 378 vs. 312 – 342), leg III (396 – 430) vs. 360 – 380), IP (1107 – 1195 vs. 1026 – 1086) and shorter AP (14 – 22 vs. 30 – 34) and from *H. podorasensis* by presence of Cp on Ta I and II (vs. absent in *H. podorasensis*), presence of famulus on Ta I (vs. absent in *H. podorasensis*), presence of microseta on Ge I and II (vs. absent in *H. podorasensis*), number of normal setae on Ti II and III (13 vs. 11), Ge II and III (9 vs. 8), BFe II & III (4 vs. 3), Ta III (18 vs. 15), longer ISD (52 – 62 vs. 32 – 46), SD (73 – 75 vs. 44 – 56), W (73 – 75 vs. 52 – 56), leg I (349 – 390 vs. 260 – 274), leg II (346 – 378 vs. 242 – 264), leg III (396 – 430 vs. 268 – 288) and IP (1107 – 1195 vs. 778 – 812).

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