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Article

A new species of *Lassenia* (Acari: Tanaupodidae) from Turkey

Javad Noei[1*], Emre Inak[2], Sultan Çobanoğlu[2] and Alireza Saboori[3]

1. *Department of Plant Protection, Faculty of Agriculture, University of Birjand, Birjand, Iran; E-mail: noei.javad@birjand.ac.ir*
2. *Ankara University Department of Plant Protection, Faculty of Agriculture, Dışkapı, Ankara, Turkey; E-mails: einak @ankara.edu.tr, Scobanoglu@ankara.edu.tr & coban.sultan@gmail.com*
3. *Jalal Afshar Zoological Museum, Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran; E-mail: saboori@ut.ac.ir*

[*] Corresponding author

ABSTRACT
Lassenia hemsinensis Noei, Saboori & Çobanoğlu **sp. nov.** (Acari: Trombidiformes: Tanaupodidae) collected from Hemşin, Rize, Turkey, on *Rumex* sp. (Polygonaceae) (off host) is described. A key to the species of *Lassenia* (larva) of the world is also provided.

KEY WORDS: Hemşin; *Lassenia*; larva; Prostigmata; Trombidiformes.

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INTRODUCTION

The family Tanaupodidae Thor consists of eight genera including *Atanaupodus* Judson & Mąkol, *Eothrombium* Berlese, *Lassenia* Newell, *Neotanaupodus* Garman, *Polydiscia* Methlagl, *Rhinothrombium* Berlese, *Tanaupodus* Haller and *Tignyia* Oudemans. *Atanaupodus*, *Eothrombium*, *Neotanaupodus*, *Rhinothrombium*, *Tanaupodus* and *Tignyia* [the *Tignyia* has been based on postlarval forms and it has been erroneously listed in Mąkol and Wohltmann (2012)] are based on post-larval forms only, *Lassenia* is based on both larval and post-larval forms and *Polydiscia* is based on larva only (Mąkol and Wohltmann 2012). The genus *Lassenia* consists of seven species six of which being based on larvae, or adults and larvae, viz., *L. lasseni* Newell, 1957 from small species of Diptera resembling Drosophilidae living in subaquatic environment, USA; *L. scutellata* Newell, 1957, from material beaten from shrubs, USA; *L. furcasetosa* Zhang, 1988 from rearing of eggs collected from soil near a water pond, China; *L. xymenae* Haitlinger, 1995 from plants, Poland; *L. castronuoviensis* Haitlinger, 2012 from herbaceous plants, Italy; and *L. novoseljensis* Haitlinger and Šundić, 2015 from herbaceous plants, Montenegro (Newell 1957; Zhang 1988; Haitlinger 1995; Haitlinger 2012; Haitlinger and Šundić 2015).

In this paper, we describe a new species of larval *Lassenia* from Turkey.

MATERIAL AND METHODS

The specimen was collected on *Rumex* sp. (Polygonaceae) [off host] by Emre Inak, 14.05.2016, Rize-

Hemşin, cleared in Nesbitt's fluid and mounted on glass microscope slides using Hoyer's medium (Walter and Krantz 2009). Figures were drawn and measurements (given in micrometers, µm) were made using a BX51 phase contrast Olympus microscope equipped with a drawing tube.

The terminology and abbreviations follow Mąkol (2007) and Saboori *et al.* (2009) except for the following characters: IL — idiosoma length, IW — idiosoma width, W — scutum width and *cs* — adoral seta.

RESULTS

Lassenia Newell, 1957

Type species: *Lassenia lasseni* Newell, 1957

Lassenia hemsinensis Noei, Saboori & Çobanoğlu **sp. nov.** (Figs. 1–11)

Diagnosis

fn Cx 2-1-2; fn Fe 6-6-6; coxalae *2b* and *3a* bifurcate; PSens 137; Ta I 155, Ta II 137, Ta III 150; fD = 4-4-4-6-4 =22.

Description (Larva)

Dorsum (Figs. 1–2) – Dorsum of idiosoma with 22 dorsal barbed setae (with minute barbs and not strongly plumose), each arises from a smooth sclerite, arranged in 5 rows, fD = 4-4-4-6-4 = 22: c_{1-2}, d_{1-2}, e_{1-2}, f_{1-3} and h_{1-2} (Figs. 1, 3). Scutum divided into two portions, the anterior portion small, almost trapezoidal (45 × 25), fitted in concavity of anterior border of posterior portion of scutum and bearing the anterior sensilla (ASens). The posterior portion quadrate-shaped, bearing normal setae (AL and PL) and posterior sensilla (PSens). ASens and scutalae with minute barbs and not strongly plumose. Posterior sensilla filiform and longer than the anterior sensilla. Posterolaterally on each side of scutum two eyes situated on common ocular plate (55 × 35), posterior eye (diameter 30) larger than anterior one (diameter 16).

Venter (Fig. 3) – Idiosoma ventrally with four pairs (+ an unpaired seta) of ventral setae (fV) behind coxae III, a lateral *Lassenia*-organ anterior to coxa III and a well-defined anus. The sternal setae *3a* bifurcate, smooth and inserted on a smooth sclerite attached to the coxa III. Each ventral seta arises from a smooth sclerite, all setae with some minute barbs. Anal plate 61 long, with one pair of barbed setae on each side of symmetry axis. Coxa I with two barbed setae, *1a* and *1b*; coxa II with seta *2b* with one barb; coxa III with nude seta *3b* and bifurcate seta *3a* (fn Cx 2-1-2). Claparède's organs between coxae I and II, circular. NDV = 22 + 8(+1) = 31.

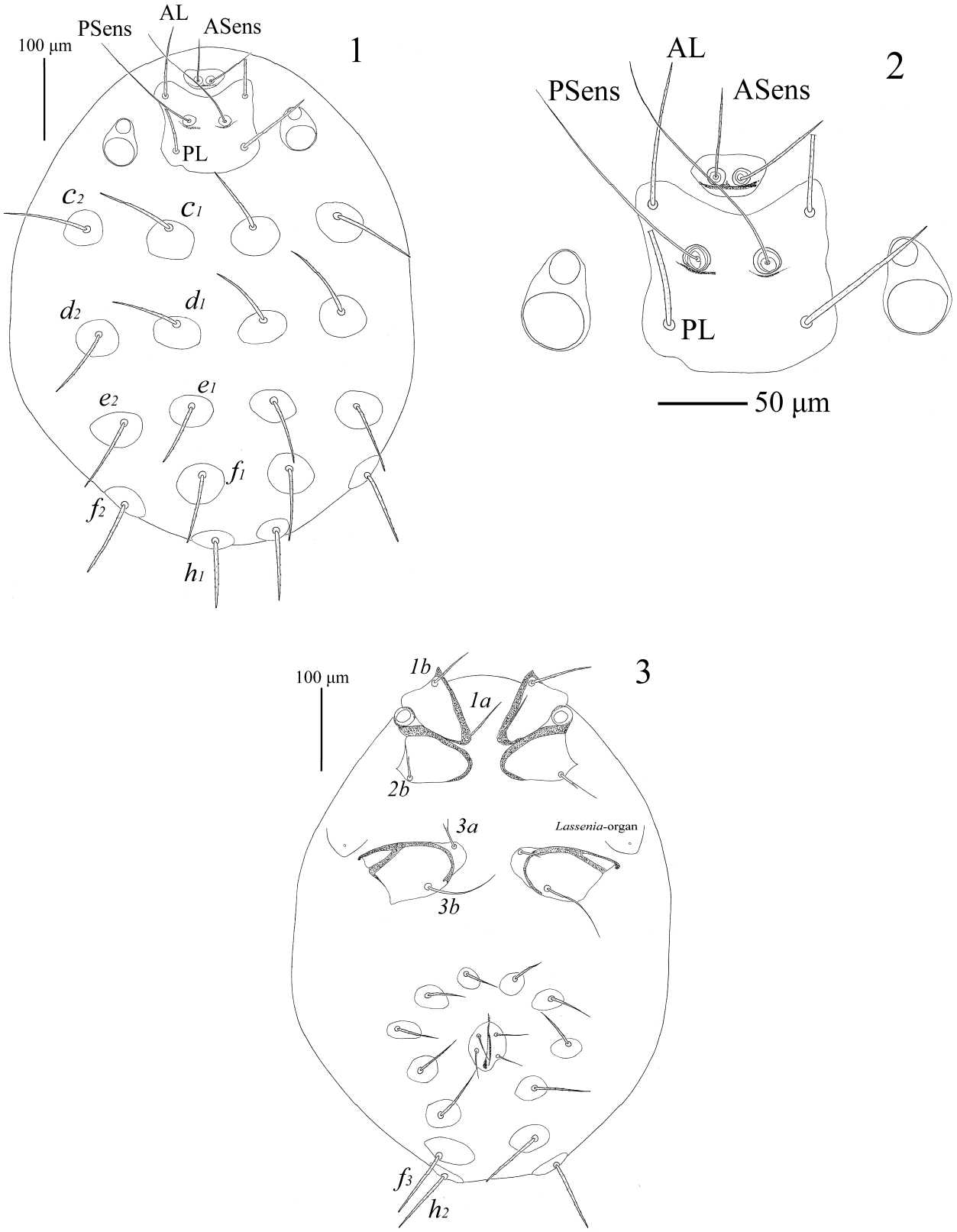
Gnathosoma (Figs. 4, 5) – Cheliceral bases (80 long) smooth on dorsal surface; cheliceral blade slightly curved, 19 long, with two subterminal teeth. Adoral seta *cs* smooth, 15 long; one pair of spine-like subcapitular setae (*bs*), 3 long; palpfemur 60 long, with two barbed dorsal setae and palpgenu 15 long, with one barbed dorsal seta. Palptibia 40 long, with three barbed setae; palpal tibial claw 27; palptarsus 37 with 7 barbed setae, one solenidion and two eupathidia; fPp = 0-BB-B-BBB-7Bωζζ. Palpal supracoxal setae (*eP*) peg-like, 8 long.

Legs (Figs. 6–11) – Leg segmentation formula 6-6-6. Each leg tarsus with lateral falciform claws and a claw-like empodium. Leg setal formula. Leg I: Ta – 1ω, 1ε, 2ζ, 2Cp, 33/36n; Ti – 4φ, 1Cp, 1κ, 8n; Ge – 2σ, 1κ, 4n; Fe – 6n; Tr – 1n (Figs. 6–7). Leg II: Ta – 1ω, 1ε, 2ζ, 1Cp, 28/30n; Ti – 2φ, 9n; Ge – 1σ, 1κ, 4n; Fe – 6n; Tr – 1n (Figs. 8–9). Leg III: Ta – 1ζ, 26/25n; Ti – 1φ, 9n; Ge – 1σ, 4n; Fe – 6n; Tr – 1n (Figs. 10–11).

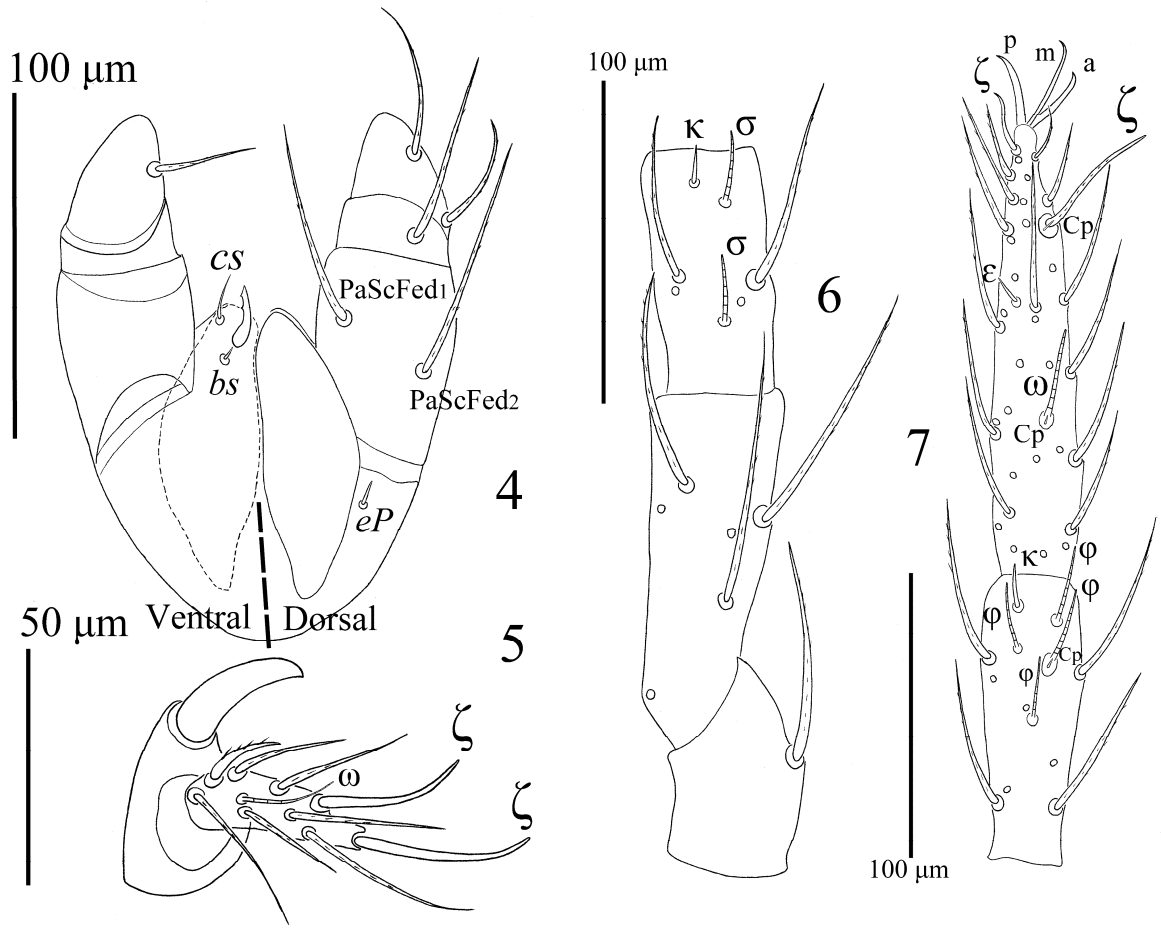
Metric data are given in Table 1.

Etymology

The specific epithet is derived from the type locality, Hemşin, Rize (41° 02' 51.7" N, 40° 53' 46.4" E), Turkey.



Figures 1–3. *Lassenia hemsinensis* Noei, Saboori & Çobanoğlu **sp. nov.** (larva) – 1. Dorsal view of idiosoma; 2. Scutum; 3. Ventral view of idiosoma.

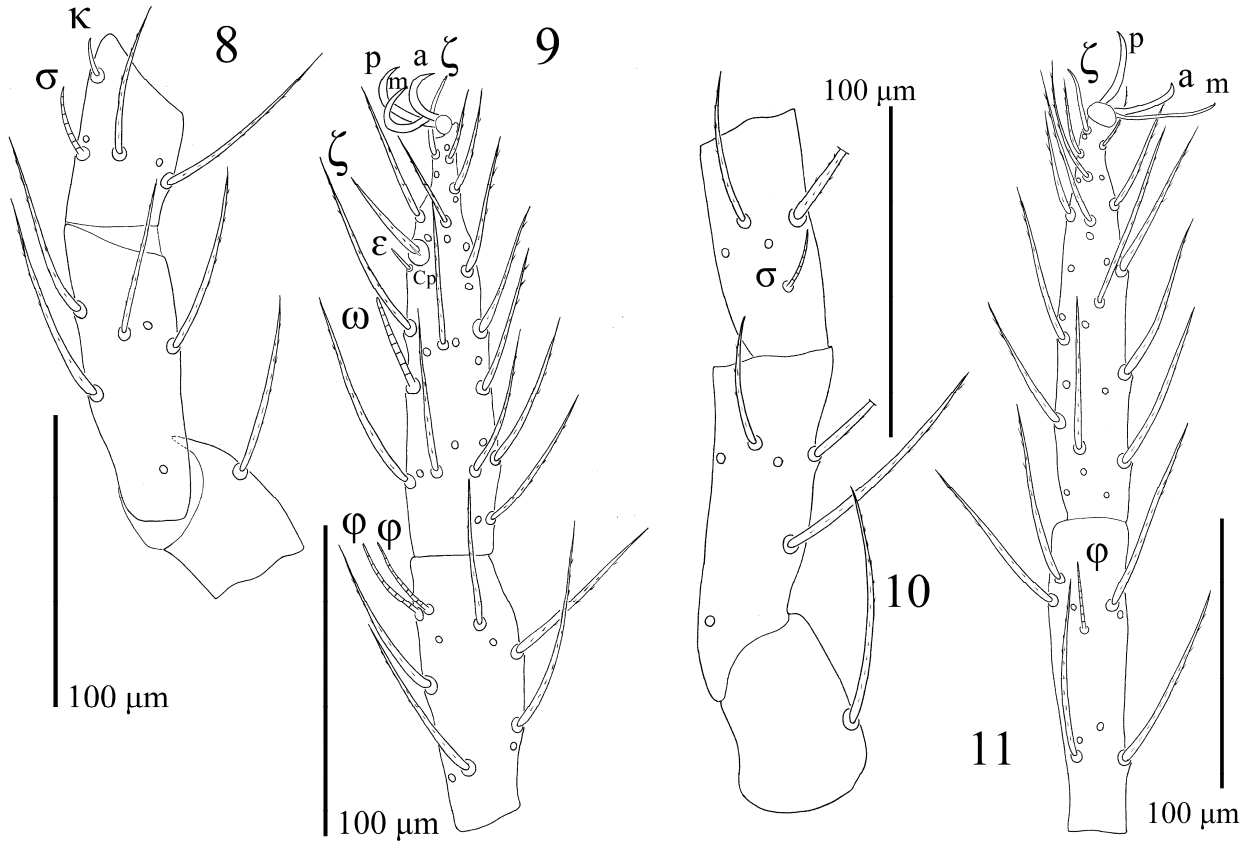


Figures 4–7. *Lassenia hemsinensis* Noei, Saboori & Çobanoğlu **sp. nov.** (larva) – 4. Dorsal (right) and ventral (left) view of gnathosoma; 5. Ventral view of palptibia and palptarsus; 6. Ti I–Ta I; 7. Tr I–Ge I.

Table 1. Measurements of *Lassenia hemsinensis* Noei, Saboori & Çobanoğlu **sp. nov.** (larva).

Character	Holotype	Character	Holotype	Character	Holotype
IL	580	PDS	80	Leg I	590
IW	430	$PaScFed_1$	67/62	Cx II	95
SD	122*	$PaScFed_2$	75	Tr II	67
W	107	PaScGed	57	Fe II	105
AW	85	*1a*	57	Ge II	65
PW	75	*1b*	75	Ti II	87
AA	13	*2b*	40/47	Ta II (L)	137
SB	37	*3a*	35	Ta II (H)	30
ASB	60*	*3b*	82	Leg II	556
PSB	62	*cs*	15	Cx III	105
MA	37/40	*bs*	3	Tr III	67
AP	65/62	Cx I	90	Fe III	107
AL	80	Tr I	65	Ge III	60
PL	85	Fe I	110	Ti III	112
ASens	52/57	Ge I	75	Ta III (L)	150
PSens	137	Ti I	95	Ta III (H)	25
DS Min.	70	Ta I (L)	155	Leg III	601
DS Max.	90	Ta I (H)	30	IP	1747

* including anterior portion of scutum



Figures 8–11. *Lassenia hemsinensis* Noei, Saboori & Çobanoğlu **sp. nov.** (larva) – 8. Ti II–Ta II; 9. Tr II–Ge II; 10. Ti III–Ta III; 11. Tr III–Ge III.

Type material

The holotype larva (ARS-20180606-1a) is deposited in the Acarological Collection, Ankara University, Department of Plant Protection, Faculty of Agriculture, Dışkapı, Ankara, Turkey.

Remarks

The new species belongs to the genus *Lassenia* based on the following characters: scutum with a pair of long posterior, and a pair of shorter anterior sensilla, plus two pairs of scutalae; anterior sensilla set off on a minute sclerite separate from the rest of the scutum; *Lassenia*-organ anterior to coxa III; anal sclerites with two pairs of setae (see diagnostic characters of *Lassenia* presented by Newell, 1957, page 448). *Lassenia hemsinensis* Noei, Saboori & Çobanoğlu **sp. nov.** differs from *L. lasseni* in the number of setae on palpfemur (2 vs. 5 in *L. lasseni*), NDV (31 vs. 71–80 [fD = 48–53, fV = 23–27]), number of setae on Cx II (1 vs. 2), Cx III (1 vs. 3), Tr II (1 vs. 3), Tr III (1 vs. 3 or 4)), Fe I (6 vs. 10) Fe II (6 vs. 10-12), Fe III (6 vs. 9 or 10), shape of coxala *2b* and sternal seta *3a* (bifurcate vs. simple), scutum (divided vs. undivided), fn Ta (33/36-28/30-26/25 vs. 50-43-40), number of solenidia on Ti I (4 vs. 13), Ti II (2 vs. 4 or 5) Ti III (1 vs. 3); from *L. scutellata* in the number of setae on Cx III (1 vs. 2), Fe III (6 vs. 5), shape of coxala *2b* and sternal seta *3a* (bifurcate vs. simple), number of solenidia on Ti I (4 vs. 5), number of normal setae on Ge I (4 vs. 5); from *L. furcasetosa* in the number of setae on Fe III (6 vs. 5), the longer PW (75 vs. 57–67), ASB (60 vs. 39–45), SD (122 vs. 105–115), ASens (52/57 vs. 34–40), AL (80 vs. 62–72), PSens (137 vs. 85–90) and IP (1747 vs. 1420–1465); from *L. xymenae* in the number of setae on Cx II (1 vs. 2), Fe III (6 vs. 5), shape of coxala *2b* and sternal seta *3a* (bifurcate vs. simple), the longer SD (122 vs. 112–116), AP

(65/62 vs. 50), AL (80 vs. 56–60), PSens (137 vs. 110) Ta I (155 vs. 108–112), Ti I (95 vs. 68–72), Ge I (75 vs. 60–62), Fe I (110 vs. 80–92), Ta II (137 vs. 94–100), Ti II (87 vs. 62–68), Ge II (65 vs. 50–56), Fe II (105 vs. 50–56), Ta III (150 vs. 106), Ti III (112 vs. 88–90) Fe III (107 vs. 84–86), IP (1747 vs. 1340) and shorter W (107 vs. 122); from *L. castronuoviensis* in the number of solenidia on Ta I (1 vs. 2), shape of coxala *2b* and sternal seta *3a* (bifurcate vs. simple), the longer ASB (60 vs. 45*), PSB (62 vs. 80*), AP (65/62 vs. 46), ASens (52/57 vs. 38), PSens (137 vs. 88), AL (80 vs. 60), Ta I (155 vs. 136), Ge I (75 vs. 62), Fe I (110 vs. 89), Ta II (137 vs. 112), Ti II (87 vs. 65), Fe II (105 vs. 88), Ta III (150 vs. 118), Fe III (107 vs. 87), IP (1747 vs. 1474) and the shorter PSB (62 vs. 80) and from *L. novoseljensis* in the number of setae on Fe III (6 vs. 5), the longer SD (122 vs. 80–102), ASens (52/57 vs. 36–39), PSens (137 vs. 76–80), AL (80 vs. 46–56), PL (85 vs. 57–65), Ta I (155 vs. 99–108), Ti (95 vs. 59–67), Ge I (75 vs. 47–52), Fe I (110 vs. 72–82), Ta II (137 vs. 86–93), Ti II (87 vs. 55–60), Ge II (65 vs. 42–47), Fe II (105 vs. 64–71), Ta III (150 vs. 95–99), Ti III (112 vs. 79–88), Fe III (107 vs. 70–77) and IP (1747 vs. 1164–1247).

* Haitlinger (2012) reported ASB = 80 and PSB = 45 in Table 2 (page 48) which are typographical errors.

Key to species of *Lassenia* of the world (larva)

1. Scutum undivided, palpfemur with five setae, Fe I with 10 setae, Ti I with 13 solenidia .... *L. lasseni* Newell, 1957
– Scutum divided, palpfemur with two setae, Fe I with 6 setae, Ti I with four or five solenidia 2
2. Ti I with five solenidia, Ge I with five normal setae..... *L scutellata* Newell, 1957
– Ti I with four solenidia, Ge I with four normal setae..... 3
3. Coxa II with two setae ..... *L. xymenae* Haitlinger, 1995
– Coxa II with one seta..... 4
4. fn Fe 6-6-5, coxala *2b* and sternal seta *3a* bifurcate 5
– fn Fe 6-6-6, coxala *2b* and sternal seta *3a* simple or bifurcate..... 6
5. AW 87–96, SD 105–115, AL 62–72, PL 76–85, IP 1420–1465..... *L. furcasetosa* Zhang, 1988
– AW 71–79, SD 80–102, AL 46–56, PL 57–65, IP 1164–1247..... ..... *L. novoseljensis* Haitlinger and Šundić, 2015
6. Coxala *2b* and sternal seta *3a* bifurcate, Ta I with one solenidion, Fe I 110, Ta III 150 .... *L. hemsinensis* Noei, Saboori & Çobanoğlu **sp. nov.**
– Coxala *2b* and sternal seta *3a* simple, Ta I with two solenidia, Fe I 89, Ta III 118..... .....*L. castronuoviensis* Haitlinger, 2012

DISCUSSION

We only observed an inconsistence in normal setae of leg tarsi in the new species, further specimens collected will allow to find a range of normal setae for these segments. But the new species has distinct difference with other species which allows us to describe it based on single specimen.

In the key to species (larva) presented by Haitlinger and Šundić (2015), the character "fn Cx" has been used. This character is not suitable for separating the *Lassenia* species and can result in misidentification, because coxala *1a* is not distinctly off or on coxa I, e.g. Haitlinger and Šundić (2015) reported coxala *1a* off coxa I, and Zhang (1988) described sternal seta *3a* on coxa III. Therefore, this paper presents an identification key using shape of scutum, number of setae on palpfemur, number of setae on leg femura, number of setae on Cx II, number of solenidia on Ti I, shape of coxala *2b* and sternal seta *3a* and other characters.

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گونهٔ جدیدی از *Lassenia* (Acari: Tanaupodidae) از ترکیه

جواد نوعی[1*]، امره اینک[2]، سلطان چوبانوغلو[2] و علیرضا صبوری[3]

۱. گروه گیاهپزشکی، دانشکدهٔ کشاورزی، دانشگاه بیرجند، بیرجند، ایران؛ رایانامه: noei.javad@birjand.ac.ir

۲. گروه گیاهپزشکی دانشگاه آنکارا، دانشکدهٔ کشاورزی دیشکاپی، آنکارا، ترکیه؛ رایانامه‌ها: einak@ankara.edu.tr ، Scobanoglu@ankara.edu.tr و coban.sultan@gmail.com

۳. موزهٔ جانورشناسی استاد جلال افشار، گروه گیاهپزشکی، پردیس کشاورزی ومنابع طبیعی، دانشگاه تهران، کرج، ایران؛ رایانامه: saboori@ut.ac.ir

* نویسندهٔ مسئول

چکیده

گونهٔ جدید *Lassenia hemsinensis* Noei, Saboori & Çobanoğlu **sp. nov.** (Acari: Trombidiformes: Tanaupodidae) جمع‌آوری شده از همشین، رایزه، ترکیه از روی *Rumex* sp. (Polygonaceae) توصیف می‌شود. همچنین کلیدی برای گونه‌های *Lassenia* (لارو) جهان ارایه می‌شود.

واژگان کلیدی: همشین؛ *Lassenia* ؛ لارو؛ پیش‌استیگمایان؛ Trombidiformes.

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