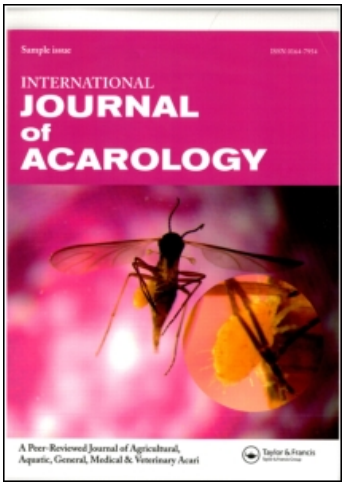

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Eriophyoid mites (Acari: Eriophyoidea) from Iran, with descriptions of three new species, one new record and a checklist

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ERIOPHYOID MITES (ACARI: ERIOPHYOIDEA) FROM IRAN, WITH DESCRIPTIONS OF THREE NEW SPECIES, ONE NEW RECORD AND A CHECKLIST

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ABSTRACT – Three new species and one new record of the eriophyoid mites from Iran are described and illustrated. They are *Aceria chenopodia* **n. sp.** on *Chenopodium album* L. (Chenopodiaceae), *Aceria mashhadiensis* **n. sp.** on *Polygonum arviculare* L. (Polygonaceae), *Tetra ferdowsiensis* **n. sp.** on *Ulmus minor* Mill. (Ulmaceae), and *Aceria fraxinivora* (Nalepa, 1909) on *Fraxinus excelsior* (Oleaceae). All the new species described herein are vagrants on the host plant. A checklist of eriophyoid mites from Iran was provided.
Key words – Acari, Diptilomiopidae, Eriophyoidea, Phytopidae, taxonomy, Iran, new species, checklist.

INTRODUCTION

Up to now, 84 eriophyoid mite species in the Eriophyoidea have been reported in Iran (Emelyanova *et al*., 1932; Sepasgozarian, 1958, 1973, 1975; Caresche and Wapshere, 1974; Gerling *et al*., 1976; Fatemi, 1986; Naeem and Akhyani, 1988; Mehrnegad and Daneshvar, 1991; Arbabi *et al*., 1999; Kamali *et al*., 2001; Hajizadeh *et al*., 2002; Flechtmann *et al*., 2003; Malik *et al*., 2003; Soroosh, 2003; Hajizadeh and Hosseini, 2004; Baradaran and Arbabi, 2005; Hong *et al*., 2005; Kamali and Amrine, 2005; Kamali and Soleimani, 2006; Khanjani and Haddad, 2006; Ramazani *et al*., 2006; Baradaran *et al*., 2008). These species belong to three families, seven subfamilies, 11 tribes and 28 genera (Table 1). Almost half of the reported species are in the genus *Aceria* (38/84). In 2008, field surveys were conducted by Dr. Hussein Sadeghi from Iran and the specimens were sent to Dr. Xiao-Yue Hong of China for identification. Three new species and one new record were found. All the new species described herein are vagrants on host plants.

MATERIALS AND METHODS

Specimens of eriophyoid mites were collected by Dr. Hussein Sadeghi from Iran. The morphological terminology used here follows Lindquist (1996) and the generic classification is made according to Amrine *et al.* (2003). Specimens were examined with a Leica DMR (Wetzlar, Germany) research microscope with phase contrast and semi-schematic drawings were made, photos were taken with Zeiss A2 (Germany) research microscope with phase contrast. For each species, the holotype female measurement precedes the corresponding range for paratypes (given in parentheses). For males only the ranges are given. All measurements are in micrometers (μm), and are lengths when not otherwise specified. Holotype and parts of the paratypes are deposited as slide mounted specimens in the Arthropod/Mite Collection of the Department of Entomology, Nanjing Agricultural University, Jiangsu Province, China. Parts of the paratypes are deposited in the Department of Plant Protection, Ferdowsi University of Mashhad, Iran.

RESULTS

Aceria chenopodia n. sp. (Figs. 1 and 2)

Description – FEMALE – (n = 8) Body vermiform, 255 (255–262), 53 (52–56) wide, 62 (60–64) thick; light yellow. *Gnathosoma* 20 (20–23), projecting obliquely down, pedipalp coxal seta (*ep*) 3 (2–3), dorsal pedipalp genual seta (*d*) 6 (6–8), cheliceral stylets

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Table 1. List of eriophyoid mites from Iran.

Family	Subfamily	Tribe	Species	Host plant
Phytoptidae	Nalepellinae	Trisetacini	*Trisetacus juniperinus* (Nalepa, 1911); Baradaran and Arbabi, 2005	*Juniperus communis*, *Cupressus sempervirens* (Cupressaceae)
	Phytoptinae		*Oziella yuccae* (Keifer, 1954); Baradaran *et al.*, 2008	*Yucca glauca*, *Y. gloriosa* (Agavaceae)
			Phytoptus avellanae Nalepa, 1889; Hajizadeh *et al.*, 2002	*Corylus avellana*, *C. maxima* (Corylaceae)
	Sierraphytoptinae	Mackiellini	*Mackiella phoenicis* Keifer, 1939a; Kamali *et al.*, 2001	*Phoenix dactylifera* (Palmae)
Eriophyidae	Cecidophyine	Cecidophyini	*Cecidophyopsis hendersoni* (Keifer, 1954); Ramazani *et al.*, 2006	*Yucca glauca*, *Y. gloriosa* (Agavaceae)
		Colomerini	*Colomerus vitis* (Pagenstecher, 1857); Hajizadeh *et al.*, 2002	*Vitis vinifera* (Vitaceae)
	Eriophyinae	Eriophyini	*Eriophyes armeniacus* Bagdasarian, 1970; Fatemi, 1986	*Pruns divaricata*, *P. persica*, *P. Armeniaca*, *P. Dulcis*, *P. sogdiana* (Rosaceae); *Juglans regia*, *J. fallax* (Juglandaceae)
			Eriophyes laevis (Nalepa, 1891a); Khanjani and Haddad, 2006	*Alnus glutinosa*, *A. incana*, *A. oregona*, *A. rhombifolia*, *A. rubra*, *A. rugosa*, *A. tenuifolia* (Betulaceae)
			Eriophyes mali Nalepa, 1926; Sepasgozarian, 1973	*Malus x-domestica*, *M. kirghisorum* (Rosaceae)
			Eriophyes orientalis (Fockeu, 1892); Khanjani and Haddad, 2006	*Cydonia oblonga*, *C. vulgaris* (Rosaceae)
			Eriophyes padi (Nalepa, 1890); Kamali *et al.*, 2001	*Pruns padus*, *P. domestica*, *P. mahaleb*, *P. prostrata*, *P. serotina*, *P. spinosa* (Rosaceae)
			Eriophyes pseudoinsidiosus Wilson, 1965; Fatemi, 1986	*Pyrus communis* (Rosaceae)

(*Continued*)

Table 1. (*Continued*)

Family	Subfamily	Tribe	Species	Host plant
			Eriophyes pyri (Pagenstecher, 1857); Khanjani and Haddad, 2006	*Pyrus communis*, *P. sitchensis*, *P. ussuriensis*, *Amelanchier ovalis*, *A. vulgaris*, *Cotoneaster fontanes*i, *C. nummularia*, *C. vulgaris*, *Sorbus aria*, *S. aucuparia*, *S.chamaemespilu*, *S. terminalia* (Rosaceae)
			Eriophyes rotundae Mohanasundaram, 1983; Ramazani *et al*., 2006	*Cyperus rotundus* (Cyperaceae)
			Eriophyes similis (Nalepa, 1890); Kamali *et al*., 2001	*Prunus domestica*, *P. armeniaca*, *P. spinosa* (Rosaceae)
			Eriophyes strobilobius Dçbski, 1918; Gerling *et al*., 1976	*Tamarix nilotica*, *T. ericoides*, *T. hispida* (Tamaricaceae)
			Eriophyes synchytrioides Dçbski, 1918; Gerling *et al*., 1976	*Tamarix tetragyna*, *T. ericoides*, *T. hispida* (Tamaricaceae)
			Stenacis calisalicis (Keifer, 1944); Khanjani and Haddad, 2006	*Salix* sp. (Salicaceae)
		Aceriini	*Acaralox farsi* Kamali and Soleimani, 2006	*Cynodon dactylon* (Poaceae)
			Acalitus alnusae Hong, Xue and Hajizadeh, 2005	*Alnus glutinosae*, *A. subcordata* (Betulaceae)
			Aceria ambix (Keifer, 1979b); Hajizadeh and Hosseini, 2004	*Quercus wislizenii* (Fagaceae); *Salix* sp. (Salicaceae)
			Aceria brachytarsa (Keifer, 1939b); Khanjani and Haddad, 2006	*Juglans hindsii*, *J. Californica* (Juglandaceae)
			Aceria brevipunctata (Nalepa, 1889); Kamali *et al.*, 2001	*Ulmus effusa*, *U. minor* (Ulmaceae)
			Aceria castaneifoliae Hong, Xue and Hajizadeh, 2005	*Quercus castaneifolia* (Fagaceae)
			Aceria chenopodia **n. sp.**	*Chenopodium album* (Chenopodiaceae)
			Aceria chinensis (Trotter, 1900); Kamali *et al.*, 2001	*Prunus armeniaca* (Rosaceae)

(*Continued*)

Table 1. (*Continued*)

Family	Subfamily	Tribe	Species	Host plant
			Aceria castaneifoliae Hong, Xue and Hajizadeh, 2005	*Quercus castaneifolia* (Fagaceae)
			Aceria chenopodia **n. sp.**	*Chenopodium album* (Chenopodiaceae)
			Aceria chinensis (Trotter, 1900); Kamali *et al.*, 2001	*Prunus armeniaca* (Rosaceae)
			Aceria chondrillae (Canestrini, 1891a); Emelyanova *et al.*, 1932, Caresche and Wapshere, 1974	*Chondrilla juncea*, *C. brevirostris*, *C. leiosperma* (Compositae)
			Aceria cousiniae Kamali and Amrine, 2005	*Cousinia eryngioides* (Asteraceae)
			Aceria dioicae (Keifer, 1979a); Kamali and Amrine, 2005	*Tamarix dioica* (Tamaricaceae)
			Aceria elaeagnicola Farkas, 1963; Hajizadeh *et al.*, 2002	*Equisetum arvense* (Equisetaceae); *Elaeagnus angustifolia* (Elaeagnaceae)
			Aceria erinea (Nalepa, 1891b); Hajizadeh *et al.*, 2002	*Julans regia* (Juglandaceae)
			Aceria eucricotes (Nalepa, 1892b); Ramazani *et al.*, 2006	*Lycium europaeum*, *L. arabicum*, *L. intricatum*, *L. halimifolium*, *L. mediterraneum*, *Solanum nigrum* (Solanaceae)
			Aceria fica (Cotte, 1920); Naeem and Akhyani, 1988	*Ficus carica* (Moraceae)
			Aceria fraxinivora (Nalepa, 1909) **n. rec.**	*Fraxinus excelsior* (Oleaceae)
			Aceria geranii (Canestrini, 1891c); Hong *et al*., 2005	*Geranium sanguineum*, *Geranium* sp. (Geraniaceae)
			Aceria granati (Canestrini and Massalongo, 1894); Hajizadeh *et al*., 2002	*Punica granatum* (Punicaceae)
			Aceria hippophaena (Nalepa, 1898b); Khanjani and Haddad, 2006	*Hippophae rhamnoides* (Elaeagnaceae); *Juglans* sp. (Juglandaceae)
			Aceria ilicis (Canestrini, 1891a); Khanjani and Haddad, 2006	*Quercus ilex*, *Q. Aegilops*, *Q. coccifera*, *Q. ithaburensis*, *Q. pedunculata* (Fagaceae)

(*Continued*)

Table 1. (*Continued*)

Family	Subfamily	Tribe	Species	Host plant
			Aceria macrochea (Nalepa, 1891a); Kamali and Amrine, 2005	*Acer pseudoplatanus*, *A. campestre*, *A. chinerascens* (Aceraceae)
			Aceria macrorhyncha (Nalepa, 1889); Khanjani and Haddad, 2006	*Acer pseudoplatanus* (Aceraceae)
			Aceria mangiferae Sayed, 1946; Arbabi *et al*., 1999	*Mangifera indica* (Anacardiaceae)
			Aceria mashhadiensis **n. sp.**	*Polygonum arviculare* (Polygonaceae)
			Aceria melongena (Zaher and Abou-Awad, 1978); Ramazani *et al*., 2006	*Solanum melongena* (Solanaceae)
			Aceria mississippiensis Chandrapatya and Baker, 1986; Hajizadeh *et al*., 2002	*Geranium carolinianum*, *G.* sp. (Geraniaceae)
			Aceria oleae (Nalepa, 1900); Sepasgozarian, 1973	*Okea europaea* (Oleaceae)
			Aceria olivi (Zaher and Abou-Awad, 1979); Soroosh, 2003	*Olea europaea* (Oleaceae)
			Aceria parapopuli (Keifer, 1940a); Sepasgozarian, 1973	*Populus alba*, *P. fremontii*, *P. nigra* (Salicaceae)
			Aceria pistaciae (Nalepa, 1899); Mehrnegad and Daneshvar, 1991	*Pistacia mutica*, *P. vera*, *P. terebinthus* (Anacardiaceae)
			Aceria pterocaryae Kuang and Gong 1996; Hong *et al*., 2005	*Malus* sp. (Rosaceae); *Pterocarya stenoptera* (Juglandaceae)
			Aceria quercina (Canestrini, 1891b); Khanjani and Haddad, 2006	*Quercus robur* (Fagaceae)
			Aceria sacchari Wang, 1964; Kamali *et al*., 2001	*Saccharum officinarum* (Poaceae)
			Aceria scariolae Kamali and Amrine, 2005	*Lactuca orientalis* (Asteraceae)

(*Continued*)

Table 1. (*Continued*)

Family	Subfamily	Tribe	Species	Host plant
			Aceria sheldoni (Ewing, 1937); Sepasgozarian, 1973	*Citrus* sp., *C. limon* (Rutaceae)
			Aceria stefanii (Nalepa, 1898a); Mehnejad and Ueckermann, 2001	*Pistacia vera*, *P. mutica*, *P. lentiscus* (Anacardiaceae)
			Aceria tosichella Keifer, 1969; Malik *et al*., 2003	*Triticum aestivum* (Poaceae)
			Aceria tristriata (Nalepa, 1890); Arbabi *et al*., 1999	*Juglans regia* (Juglandaceae)
			Aceira tulipae (Keifer, 1938a); Khanjani and Haddad, 2006	*Tulipa cultivar (* Liliaceae)
			Aceria zanjani Flechtmann, Tarasi and Saboori, 2003	*Populus nigra* (Salicaceae)
	Phyllocoptinae	Acaricalini	*Acaphylla theae* (Watt and Mann, 1903); Khanjani and Haddad, 2006	*Camellia sinensis* (Theaceae)
			Acaphyllisa distasa (Keifer, 1961); Hajizadeh and Hosseini, 2004	*Betula populifolia* (Betulaceae); *Salix* sp. (Salicaceae)
		Calacarini	*Calacarus citrifolii* Keifer, 1955; Khanjani and Haddad, 2006	*Citrus* sp. (Rutaceae); *Carica papaya* (Caricaceae); *Dianthus* sp.(Caryophyllaceae); *Passiflora quadrangularis* (Passifloraceae); *Prunus persica* (Rosaceae); *Rhamnus* sp.(Rhamanaceae); *Rhus* sp.(Anacardiaceae); *Zantedeschia aethiopica* (Araceae)
		Tegonotini	*Oxycenus maxwelli* (Keifer, 1939a); Soroosh, 2003	*Olea europaea* (Oleaceae)
			Shevtchenkella ulmi (Farkas, 1960); Hajizadeh and Hosseini, 2004	*Ulmus procera*, *U. minor* (Ulmaceae)
			Tegonotus simus (Keifer, 1940b); Hajizadeh andHosseini, 2004	*Alnus rugosa*, *A. subcordata* (Betulaceae)

(*Continued*)

Table 1. (*Continued*)

Family	Subfamily	Tribe	Species	Host plant
		Phyllocoptini	*Calepitrimerus baileyi* Keifer, 1938b; Hajizadeh and Hosseini, 2004	*Malus x-domestica*, *M. kirghisorum* (Rosaceae)
			Calepitrimerus vitis (Nalepa, 1905); Khanjani and Haddad, 2006	*Vitis vinifera* (Vitaceae)
			Epitrimerus marginemtorquens (Nalepa, 1917); Fatemi, 1986	*Pyrus communis* (Rosaceae)
			Epitrimerus pyri (Nalepa, 1894); Kamali *et al*., 2001	*Pyrus communis*, *P. serotina* var. *culta* (Rosaceae)
			Phyllocoptes graniti Keifer, 1959a; Sepasgozarian, 1975	*Prunus dulcis* (Rosaceae)
			Phyllocoptes pruni Soliman and Abou-Awad, 1978; Hajizadeh and Hosseini, 2004	*Prunus domestica* (Rosaceae)
			Phyllocoptruta oleivora (Ashmead, 1879); Sepasgozarian, 1958	*Citrus limon*, *C. sinensis* (Rutaceae)
			Vasates quadripedes Shimer, 1869; Kamali *et al*., 2001	*Acer saccharinum* (Aceraceae)
		Anthocoptini	*Aculops lycopersici* (Tryon, 1917); Sepasgozarian, 1973	*Lycopersicon lycopersicum*, *L. esculentum*, *Capsicum annuum*, *C. frutescens*, *Datura* sp., *Nicotiana tabacum*, *Petunia sp*, *Physalis sp*; *Solanum douglasi*, *S. tuberosum* (Solanaceae)
			Aculops pelekassi (Keifer, 1959b); Hajizadeh and Hosseini, 2004	*Citrus reticulate*, *C.* sp. (Rutaceae)
			Aculops rhodensis (Keifer, 1957); Hajizadeh andHosseini, 2004	*Salix* sp. (Salicaceae)
			Aculus ligustri (Keifer, 1938b); Hajizadeh andHosseini, 2004	*Ligustrum ovalifolium*, *L. vulgare*, *L*. sp. (Oleaceae)

(*Continued*)

Table 1. (*Continued*)

Family	Subfamily	Tribe	Species	Host plant
			Aculus schlechtendali (Nalepa, 1890); Khanjani and Haddad, 2006	*Malus x-domestica*, *M. sylvestris* (Rosaceae)
			Aculus semenovi (Shevtchenko, Marikovski and Shamsutdinova, 1973); Baradaran *et al.*, 2008	*Sophora alopecuroidea* (Leguminosae)
			Aculus solani Boczek and Davis, 1984; Ramazani *et al.*, 2006	*Solanum nigrum*, *Lycium* sp.(Solanaceae)
			Aculus tetranothrix (Nalepa, 1889); Khanjani and Haddad, 2006	*Salix* sp. (Salicaceae)
			Notallus nerii Keifer, 1975; Ramazani *et al.*, 2006	*Nerium oleander*, *N. olender* (Apocynaceae)
			Tegolophus hassani (Keifer, 1959b); Khanjani and Haddad, 2006	*Olea europaea* (Oleaceae)
			Tetra ferdowsiensis **n. sp.**	*Ulmus minor* (Ulmaceae)
Diptilomiopidae	Diptilomiopinae		*Diptacus gigantorhynchus* (Nalepa, 1892a); Hajizadeh and Hosseini, 2004	*Prunus domestica*, *P. abium*, *P. cerasus*, *P. insititia*, *P. spinosa*, *Cydonia vulgaris* (Rosaceae); *Ribes rubrum* (Saxifragaceae)

17 (16–17). *Prodorsal shield* 28 (28–30), 42 (40–43) wide; anterior shield lobe absent; median lines broken at basal one-third, admedian and submedian lines completely and parallel. Scapular tubercles on rear shield margin, 22 (22–23) apart, scapular setae (*sc*) 58 (56–63), projecting posterior. *Coxal plates* smooth, anterolateral setae on coxisternum *I* (*1b*) 12 (12–13), 12 (12–13) apart, proximal setae on coxisternum *I* (*1a*) 31 (31–35), 10 (9–10) apart, proximal setae on coxisternum *II* (*2a*) 45 (43–48), 23 (23–24) apart. Prosternal apodeme 6 (6–7). *Legs* with usual series of setae. Leg *I* 40 (38–41), femur 11 (11–12), basiventral femoral seta (*bv*) 13 (12–13); genu 5 (5–6), antaxial genual seta (*l″*) 30 (26–33); tibia 9 (8–9), paraxial tibial seta (*l′*) 9 (7–9), located at one-third from dorsal base; tarsus 7 (7–8), seta *ft′* 18 (18–20), seta *ft″* 33 (30–35), seta *u′* 7 (7–8); tarsal empodium (*em*) 7 (7–8), simple, six-rayed, tarsal solenidion (*ω*) 8 (7–8), rod-like. Leg *II* 36 (35–38), femur 9 (8–9), basiventral femoral seta (*bv*) 11 (11–12); genu 5 (5–6), antaxial genual seta (*l″*) 13 (11–13); tibia 7 (6–7); tarsus 8 (7–8), seta *ft′* 7 (6–7), seta *ft″* 31 (30–33), seta *u′* 7 (6–7); tarsal empodium (*em*) 7 (7–8), simple, six-rayed, tarsal solenidion (*ω*) 8 (7–8), rod-like. *Opisthosoma*: opisthosoma dorsally with 65 (60–66) annuli, with elliptical microtubercles, ventrally with 62 (58–64) annuli, with smaller elliptical microtubercles. Setae *c2* 50 (50–53) on ventral annulus 10 (10–11), 55 (55–56) apart; setae *d* 53 (46–53) on ventral annulus 22 (21–22), 45 (44–45) apart; setae *e* 52 (52–56) on ventral annulus 39 (38–39), 25 (25–26) apart, setae *f* 33 (31–33) on sixth ventral annulus from rear, 27 (26–27) apart. Setae *h1* 7 (7–8), *h2* 83 (80–89). *Female genitalia* 14 (13–15), 24 (21–25) wide, coverflap with eight longitudinal ridges and a transverse line at base, setae *3a* 33 (33–34), 15 (15–16) apart.

MALE – Unknown.

Type material – **HOLOTYPE**, female (slide number Iran 53, marked Holotype), from *Chenopodium*

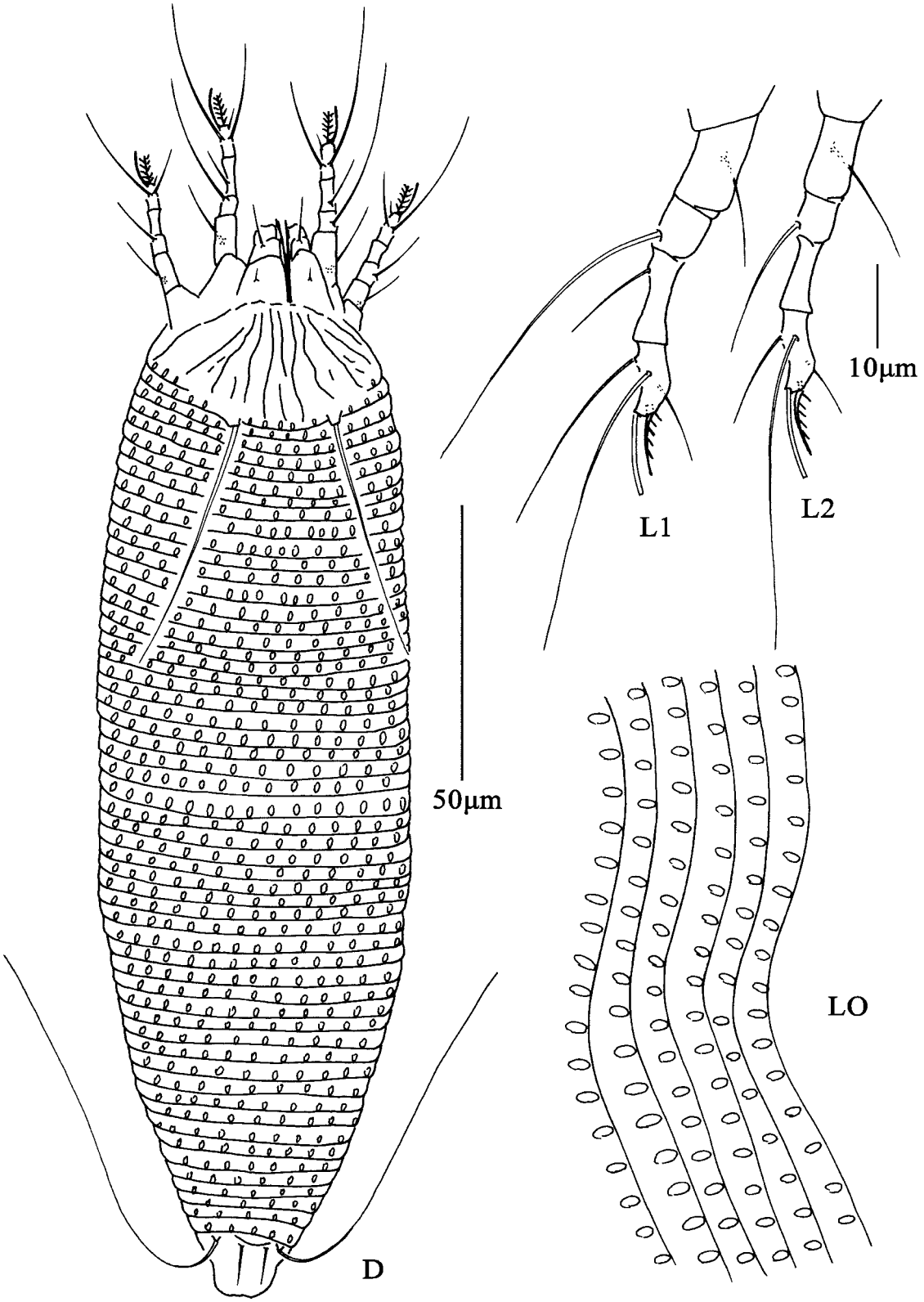

Fig. 1. *Aceria chenopodia* **n. sp.** D. dorsal view of female, LO. lateral microtubercles, L1. leg I, L2. leg II.

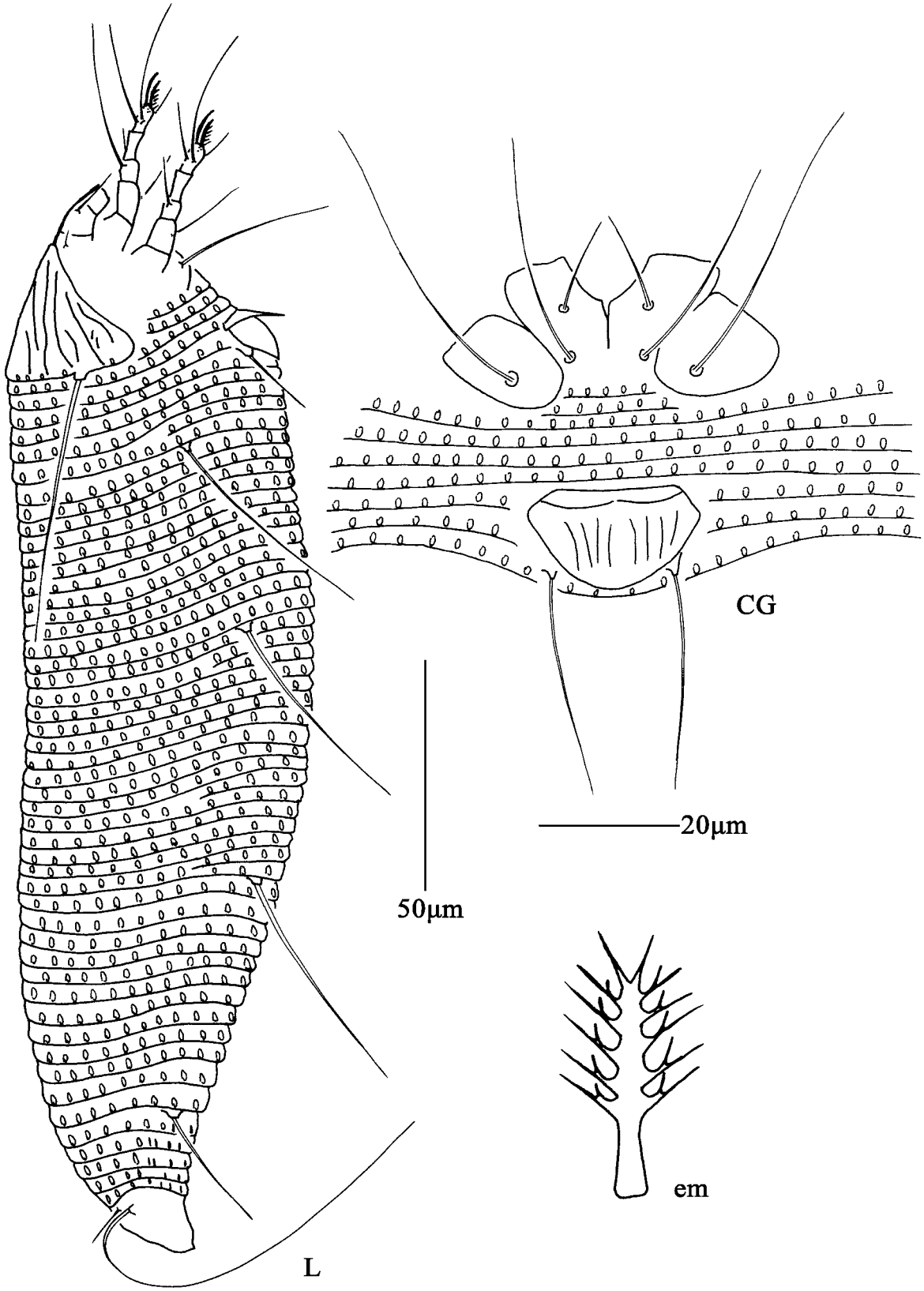

Fig. 2. *Aceria chenopodia* **n. sp.** L. lateral view of female, CG. coxae and female genitalia, em. empodium.

album L. (Chenopodiaceae), Ferdowsi University Campus (Mashhad), Razavi Khorasan Province, Iran, 2-IX-2008, coll. Hussein Sadeghi, deposited as slide mounted specimens in the Arthropod/Mite Collection of the Department of Entomology, Nanjing Agricultural University, Jiangsu Province, China. **PARATYPES**, seven females (slide number Iran 53), with the same data as holotype; 11 specimens, from *Chenopodium album* L. (Chenopodiaceae), Ferdowsi University Campus (Mashhad), Razavi Khorasan Province, Iran, 2-IX-2008, coll. Hussein Sadeghi, deposited in the Department of Plant Protection, Ferdowsi University of Mashhad, Iran.

Relation to host – Vagrant on flowering parts. No damage symptom to the host was observed.

Etymology – The specific designation *chenopodia* is from the generic name of host plant, *Chenopodium*.

Differential diagnosis – This species is similar to *A. zanjani* Flechtmann, Tarasi and Saboori, 2003 (from Iran), but can be differentiated from the latter by prodorsal shield with median, admedian and submedian lines (prodorsal shield with many granules in *A. zanjani*), female genital coverflap with eight longitudinal ridges (female genital coverflap smooth in *A. zanjani*).

Aceria mashhadiensis n. sp. (Figs. 3 and 4)

Description – FEMALE – (n = 8) Body vermiform, 245 (240–245), 61 (60–61) wide, 53 (50–54) thick; light yellow. *Gnathosoma* 25 (24–25), projecting obliquely down, pedipalp coxal seta (*ep*) 3 (2–3), dorsal pedipalp genual seta (*d*) 10 (9–10), cheliceral stylets 21 (20–21). *Prodorsal shield* 33 (33–34), 48 (46–48) wide; anterior shield lobe absent; shield smooth. Scapular tubercles on rear shield margin, 26 (25–26) apart, scapular setae (*sc*) 35 (34–36), projecting posterior. *Coxal plates* with granules, anterolateral setae on coxisternum *I* (*1b*) 15 (15–16), 13 (13–14) apart, proximal setae on coxisternum *I* (*1a*) 23 (22–25), 10 (10–11) apart, proximal setae on coxisternum *II* (*2a*) 29 (27–32), 20 (20–23) apart. Prosternal apodeme 7 (6–7). *Legs* with usual series of setae. Leg *I* 37 (36–39), femur 11 (11–12), basiventral femoral seta (*bv*) 10 (10–11); genu 5 (5–6), antaxial genual seta (*l″*) 25 (24–26); tibia 7 (7–8), paraxial tibial seta (*l′*) 5 (4–5), located at one-third from dorsal base; tarsus 7 (7–8), seta *ft′* 18 (18–20), seta *ft″* 28 (28–30), seta *u′* 5 (5–6); tarsal empodium (*em*) 7 (7–8), simple, seven-rayed, tarsal solenidion (ω) 8 (7–8), rod-like. Leg *II* 36 (36–38), femur 11 (10–11), basiventral femoral seta (*bv*) 7 (7–8); genu 5 (4–5), antaxial genual seta (*l″*) 11 (11–12); tibia 7 (6–7); tarsus 7 (7–8), seta *ft′* 6 (6–7), seta *ft″* 27 (27–30), seta *u′* 5 (4–5); tarsal empodium (*em*) 7 (7–8), simple, seven-rayed, tarsal solenidion (ω) 8 (7–8), rod-like. *Opisthosoma*: opisthosoma dorsally with 68 (65–69) annuli, with narrow elliptical microtubercles, last 11 (11–12) annuli smooth, ventrally with 68 (66–70) annuli, with round microtubercles. Setae *c2* 36 (35–37) on ventral annulus 15 (13–15), 55 (55–56) apart; setae *d* 70 (66–70) on ventral annulus 25 (24–25), 40 (40–41) apart; setae *e* 13 (12–16) on ventral annulus 40 (38–40), 21 (21–22) apart, setae *f* 35 (33–36) on eighth ventral annulus from rear, 25 (25–26) apart. Setae *h1* 6 (6–7), *h2* 63 (60–69). *Female genitalia* 14 (14–16), 21 (21–23) wide, coverflap with two transverse lines at base and 10 longitudinal ridges, setae *3a* 28 (28–29), 14 (14–16) apart.

MALE – (n = 2) Body vermiform, 201–210, 55 wide, 45 thick; light yellow. *Gnathosoma* 22–23, projecting obliquely down, pedipalp coxal seta (*ep*) 2–3, dorsal pedipalp genual seta (*d*) 7–8, cheliceral stylets 19–20. *Prodorsal shield* 28–29, 40 wide; anterior shield lobe absent; shield smooth. Scapular tubercles on rear shield margin, 27 apart, scapular setae (*sc*) 28–30, projecting posterior. *Coxal plates* with granules, anterolateral setae on coxisternum *I* (*1b*) 10–12, 14–15 apart, proximal setae on coxisternum *I* (*1a*) 17–19, 10–11 apart, proximal setae on coxisternum *II* (*2a*) 27–30, 22–23 apart. Prosternal apodeme 5–6. *Legs* with usual series of setae. Leg *I* 33–35, femur 10–11, basiventral femoral seta (*bv*) 10–11; genu 5–6, antaxial genual seta (*l″*) 21–22; tibia 5–6, paraxial tibial seta (*l′*) 4–5, located at one-third from dorsal base; tarsus 6–7, seta *ft′* 12–13, seta *ft″* 23–25, seta *u′* 5–6; tarsal empodium (*em*) 7–8, simple, seven-rayed, tarsal solenidion (ω) 7–8, rod-like. Leg *II* 30–32, femur 8–9, basiventral femoral seta (*bv*) 7–8; genu 4–5, antaxial genual seta (*l″*) 8–9; tibia 6–7; tarsus 6–7, seta *ft′* 5–6, seta *ft″* 20–22, seta *u′* 4–5; tarsal empodium (*em*) 6–7, simple, seven-rayed, tarsal solenidion (ω) 7–8, rod-like. *Opisthosoma*: opisthosoma dorsally with 64–65 annuli, with narrow elliptical microtubercles, ventrally with 63–64 annuli, with round microtubercles. Setae *c2* 28–29 on ventral annulus 13–14, 55 apart; setae *d* 46–47 on ventral annulus 22–23, 37 apart; setae *e* 7–8 on ventral annulus 35, 20 apart, setae *f* 20–23 on eighth ventral annulus from rear, 26 apart. Setae *h1* 4–5, *h2* 30–33. *Male genitalia* 22 wide, setae *3a* 28–29, 16 apart.

Type material – **HOLOTYPE**, female (slide number Iran 54, marked Holotype), from *Polygonum arviculare* L. (Polygonaceae), Mashhad, Razavi Khorasan Province, Iran, 7-X-2008, coll. Hussein Sadeghi, deposited as slide mounted specimens in the Arthropod/Mite Collection of the Department of Entomology, Nanjing Agricultural University, Jiangsu Province, China. **PARATYPES**, seven females and two males (slide number Iran 54), with the same data as holotype; 13 specimens, from *Polygonum arviculare* L.

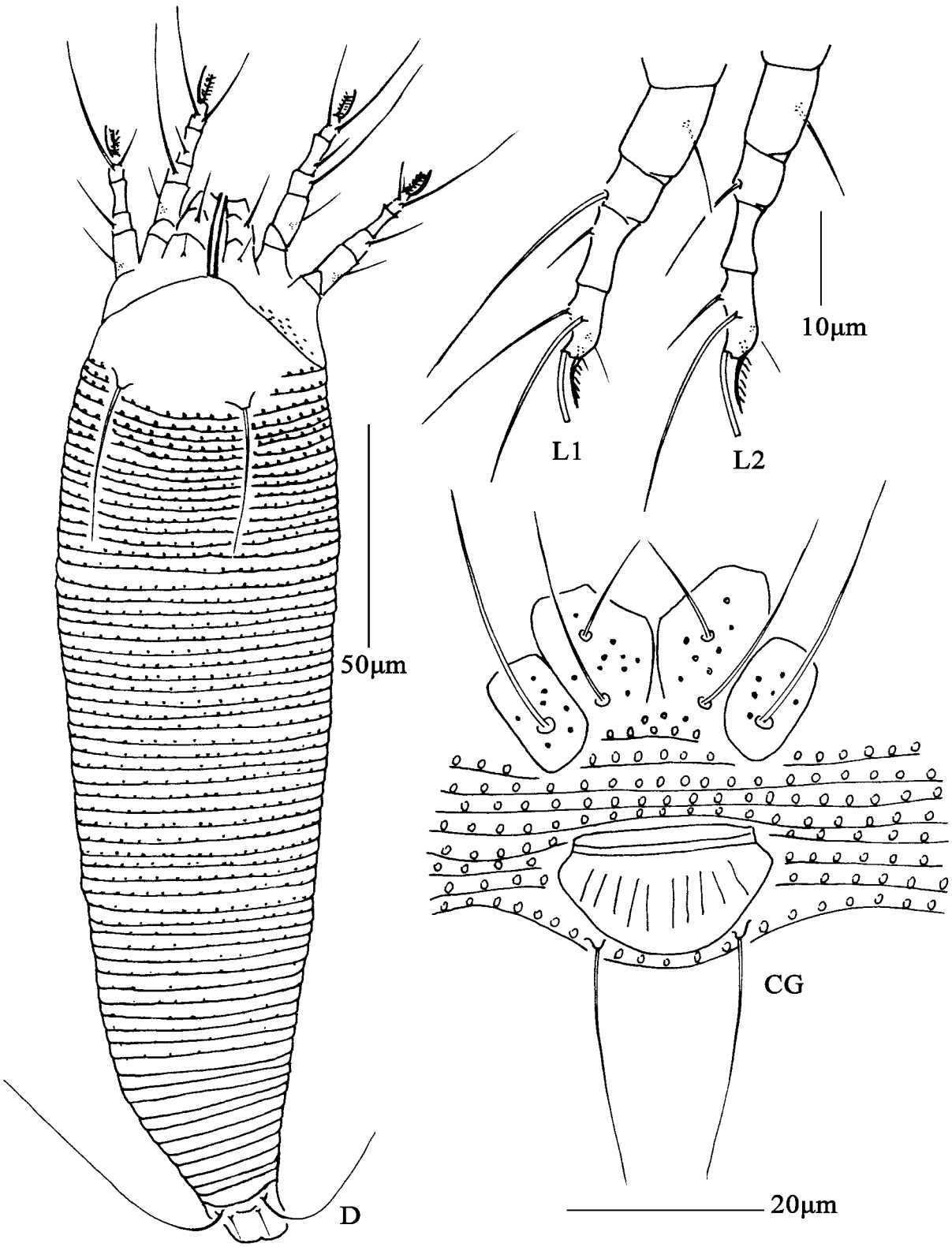

Fig. 3. *Aceria mashhadiensis* **n. sp.** D. dorsal view of female, CG. coxae and female genitalia, L1. leg I, L2. leg II.

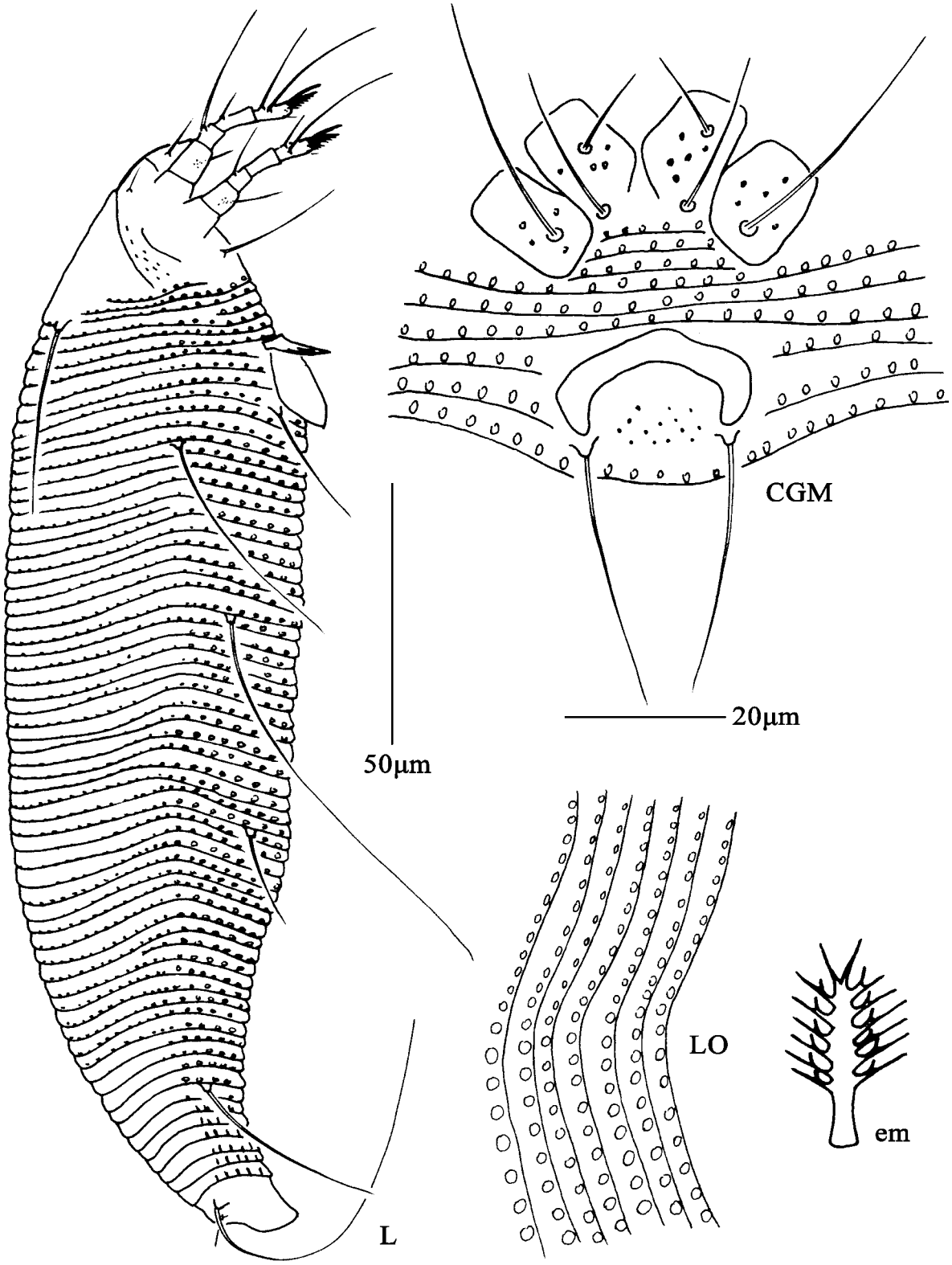

Fig. 4. *Aceria mashhadiensis* **n. sp.** L. lateral view of female, CGM. coxae and genitalia of male, em. empodium, LO. lateral microtubercles.

(Polygonaceae), Mashhad, Razavi Khorasan Province, Iran, 7-X-2008, coll. Hussein Sadeghi, deposited in the Department of Plant Protection, Ferdowsi University of Mashhad, Iran.

Relation to host – Vagrant on flowering parts of host. No gall was observed on infested plants.

Etymology – The specific designation *mashhadiensis* is from the name of location, Mashhad, where the type species were collected.

Differential diagnosis – This species is similar to *A. sawatchense* Keifer, 1965 (from *Polygonum sawatchense*), but can be differentiated from the latter by prodorsal shield smooth (prodorsal shield with designs in *A. sawatchense*), female genital coverflap with 10 longitudinal ridges (female genital coverflap with 14–18 longitudinal ridges in *A. sawatchense*), coxal plate with granules (coxal plate with dashes and lines of granules in *A. sawatchense*).

Tetra ferdowsiensis n. sp (Figs. 5 and 6)

Description – FEMALE – (n = 6) Body fusiform, 183 (175–183), 65 (65–66) wide, 68 (68–70) thick; light yellow. *Gnathosoma* 20 (18–20), projecting down, pedipalp coxal seta (*ep*) 3 (3–4), dorsal pedipalp genual seta (*d*) 7 (7–8), cheliceral stylets 13 (13–14). *Prodorsal shield* 41 (41–43), 55 (55–56) wide; anterior shield lobe broad; shield smooth. Scapular tubercles on rear shield margin, 36 (35–36) apart, scapular setae (*sc*) 13 (13–15), projecting posterior. *Coxal plates* smooth, anterolateral setae on coxisternum *I* (*1b*) 12 (12–13), 11 (11–12) apart, proximal setae on coxisternum *I* (*1a*) 21 (21–23), 9 (9–10) apart, proximal setae on coxisternum *II* (*2a*) 32 (32–35), 26 (26–28) apart. Prosternal apodeme 7 (6–7). *Legs* with usual series of setae. Leg *I* 35 (35–38), femur 9 (9–10), basiventral femoral seta (*bv*) 12 (12–13); genu 4 (4–5), antaxial genual seta (*l″*) 21 (21–22); tibia 6 (6–7), paraxial tibial seta (*l′*) 5 (4–5), located at one-third from dorsal base; tarsus 8 (7–8), seta *ft′* 21 (20–22), seta *ft″* 26 (25–26), seta *u′* 6 (5–6); tarsal empodium (*em*) 8 (7–8), simple, four-rayed, tarsal solenidion (ω) 8 (7–8), rod-like. Leg *II* 31 (31–33), femur 8 (7–8), basiventral femoral seta (*bv*) 14 (14–15); genu 3 (3–4), antaxial genual seta (*l″*) 6 (5–6); tibia 5 (5–6); tarsus 8 (7–8), seta *ft′* 8 (7–8), seta *ft″* 23 (23–26), seta *u′* 5 (4–5); tarsal empodium (*em*) 7 (7–8), simple, four-rayed, tarsal solenidion (ω) 8 (7–8), rod-like. *Opisthosoma*: opisthosoma dorsally with 25 (25–27) annuli, smooth, ventrally with 55 (53–57) annuli, smooth. Setae *c2* 17 (17–18) on ventral annulus 8 (8–10), 52 (52–53) apart; setae *d* 52 (52–55) on ventral annulus 18 (18–20), 35 (35–36) apart; setae *e* 12 (12–13) on ventral annulus 34 (34–35), 17 (16–17) apart, setae *f* 25 (23–25) on fifth ventral annulus from rear, 17 (16–17) apart. Setae *h1* minute, *h2* 73 (70–75). *Female genitalia* 10 (10–11), 20 (20–22) wide, with eight longitudinal ridges, setae *3a* 30 (30–35), 16 (16–17) apart.

MALE – Unknown.

Type material – **HOLOTYPE**, female (slide number Iran 55, marked Holotype), from *Ulmus minor* Mill. (Ulmaceae), Ferdowsi University campus, Mashhad, Iran, 17-X-2008, coll. Hussein Sadeghi, deposited as slide mounted specimens in the Arthropod/Mite Collection of the Department of Entomology, Nanjing Agricultural University, Jiangsu Province, China. **PARATYPES**, five females (slide number Iran 55), with the same data as holotype; six specimens, from *Ulmus minor* Mill. (Ulmaceae), Ferdowsi University campus, Mashhad, Iran, 17-X-2008, coll. Hussein Sadeghi, deposited in the Department of Plant Protection, Ferdowsi University of Mashhad, Iran.

Relation to host – Vagrant on leaf surface. This mite was found of no apparent damage to host plants.

Etymology – The specific designation *ferdowsiensis* is from name of University, Ferdowsi University, where the type species were collected.

Differential diagnosis – This species is similar to *T. ulmi* (Boczek and Szymkowiak, 1997) (from *Ulmus laevis*), but can be differentiated from the latter by ventral annuli smooth (ventral annuli with microtubercles in *T. ulmi*), scapular setae short (13 μm) (scapular setae 120 μm, much longer in *T. ulmi*), solenidion rod-like (solenidion knobbed in *T. ulmi*).

Aceria fraxinivora (Nalepa, 1909) (Figs. 7–9)

Phytoptus fraxini Karpelles, 1884: 52.
Eriophyes fraxinivorus Nalepa, 1909: 117.
Aceria fraxinivora; Roivainen, 1951: 8.
Eriophyes fraxinivorus; Davis *et al*., 1982: 127.
Aceria fraxinivorus; Amrine and Stasny, 1994: 48.

Description – FEMALE – (n = 5) Body vermiform, 200 (185–200), 42 (40–42) wide, 42 (40–42) thick; light yellow. *Gnathosoma* 18 (17–18), projecting obliquely down, pedipalp coxal seta (*ep*) 4 (4–5), dorsal pedipalp genual seta (*d*) 7 (6–7), cheliceral stylets 15 (15–16). *Prodorsal shield* 20 (20–21), 22 (22–26) wide; anterior shield lobe absent; with incomplete admedian lines. Scapular tubercles on rear shield margin, 16 (15–16) apart, scapular setae (*sc*) 18 (17–18), projecting posterior. *Coxal plates* with granules, anterolateral setae on coxisternum *I* (*1b*) 13 (13–14), 7 (7–8) apart, proximal setae on coxisternum *I* (*1a*) 23 (22–23), 5 (5–6) apart, proximal setae on coxisternum *II* (*2a*) 29 (28–30), 15 (15–16) apart. Prosternal apodeme

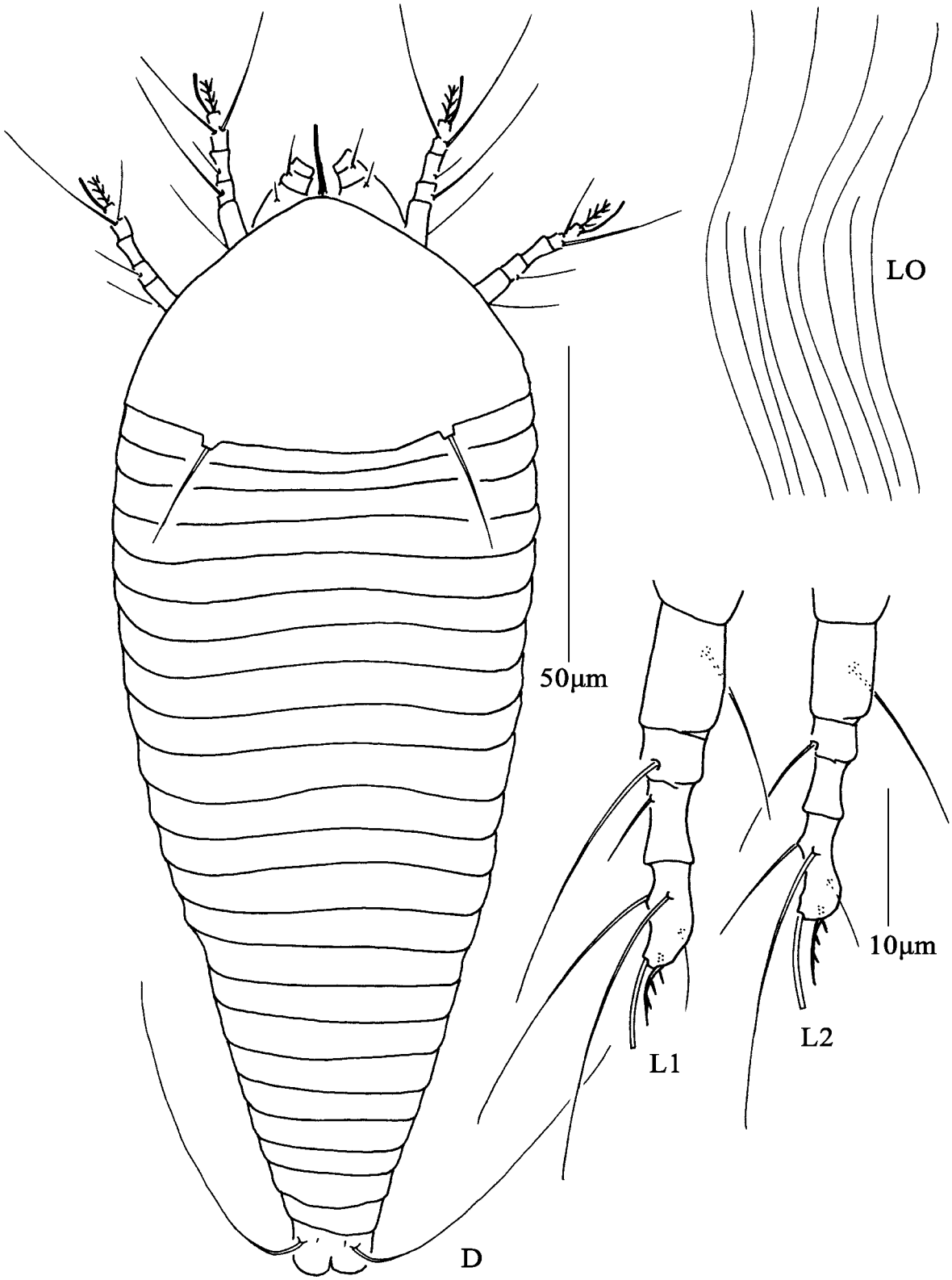

Fig. 5. *Tetra ferdowsiensis* **n. sp.** D. dorsal view of female, LO. lateral microtubercles, L1. leg I, L2. leg II.

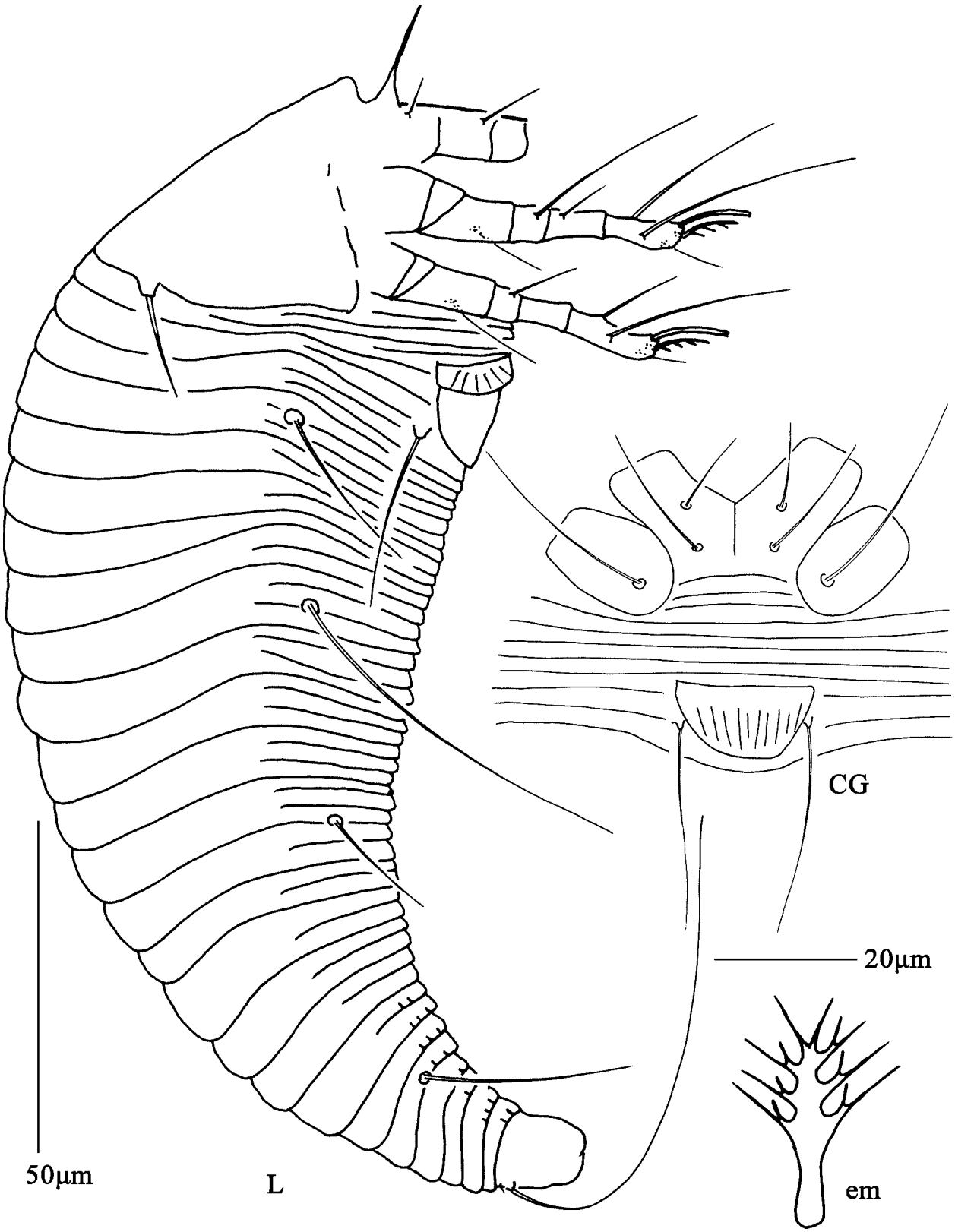

Fig. 6. *Tetra ferdowsiensis* **n. sp.** L. lateral view of female, CG. coxae and female genitalia, em. empodium.

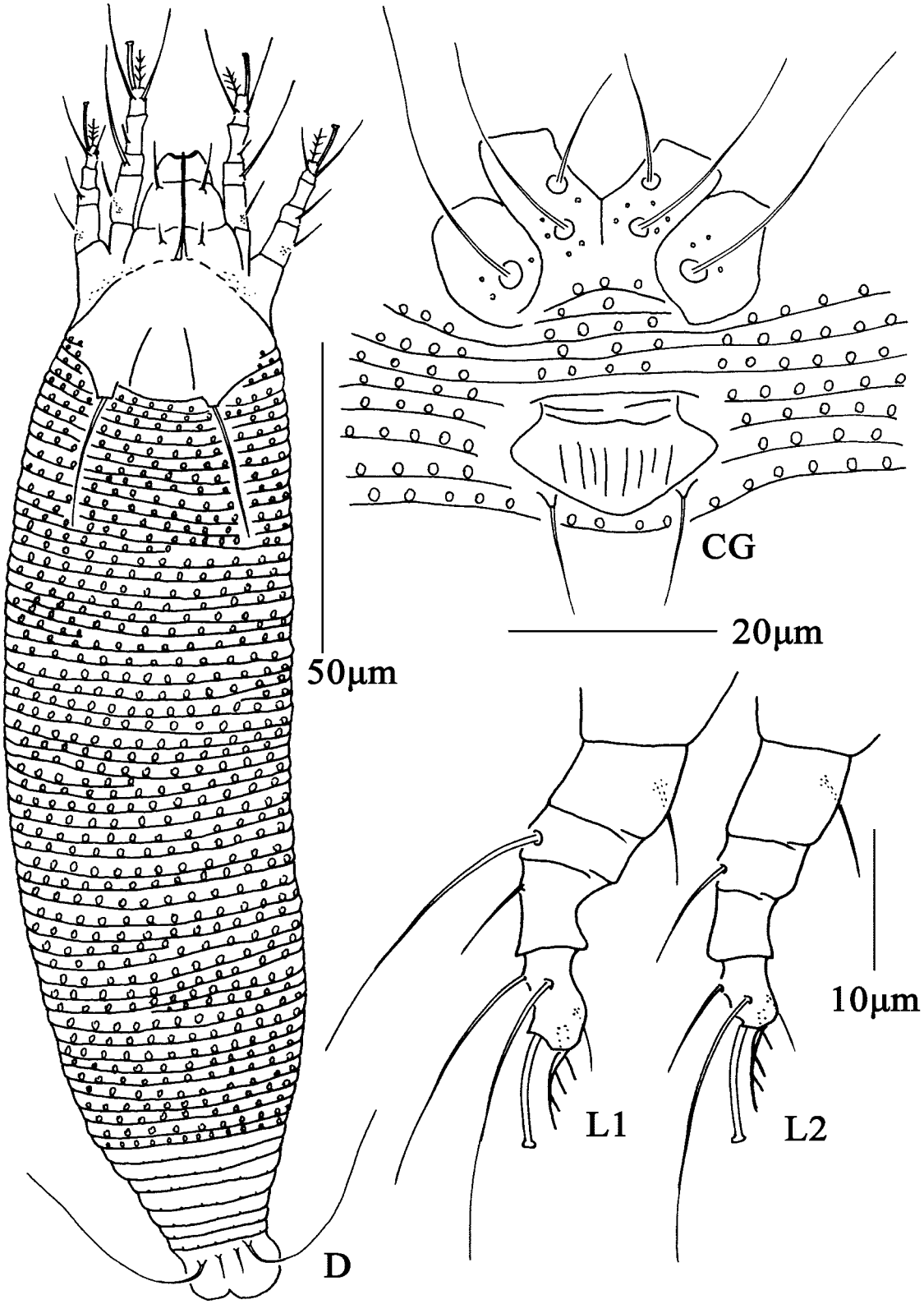

Fig. 7. *Aceria fraxinivora* (Nalepa, 1909) D. dorsal view of female, CG. coxae and female genitalia, L1. leg I, L2. leg II.

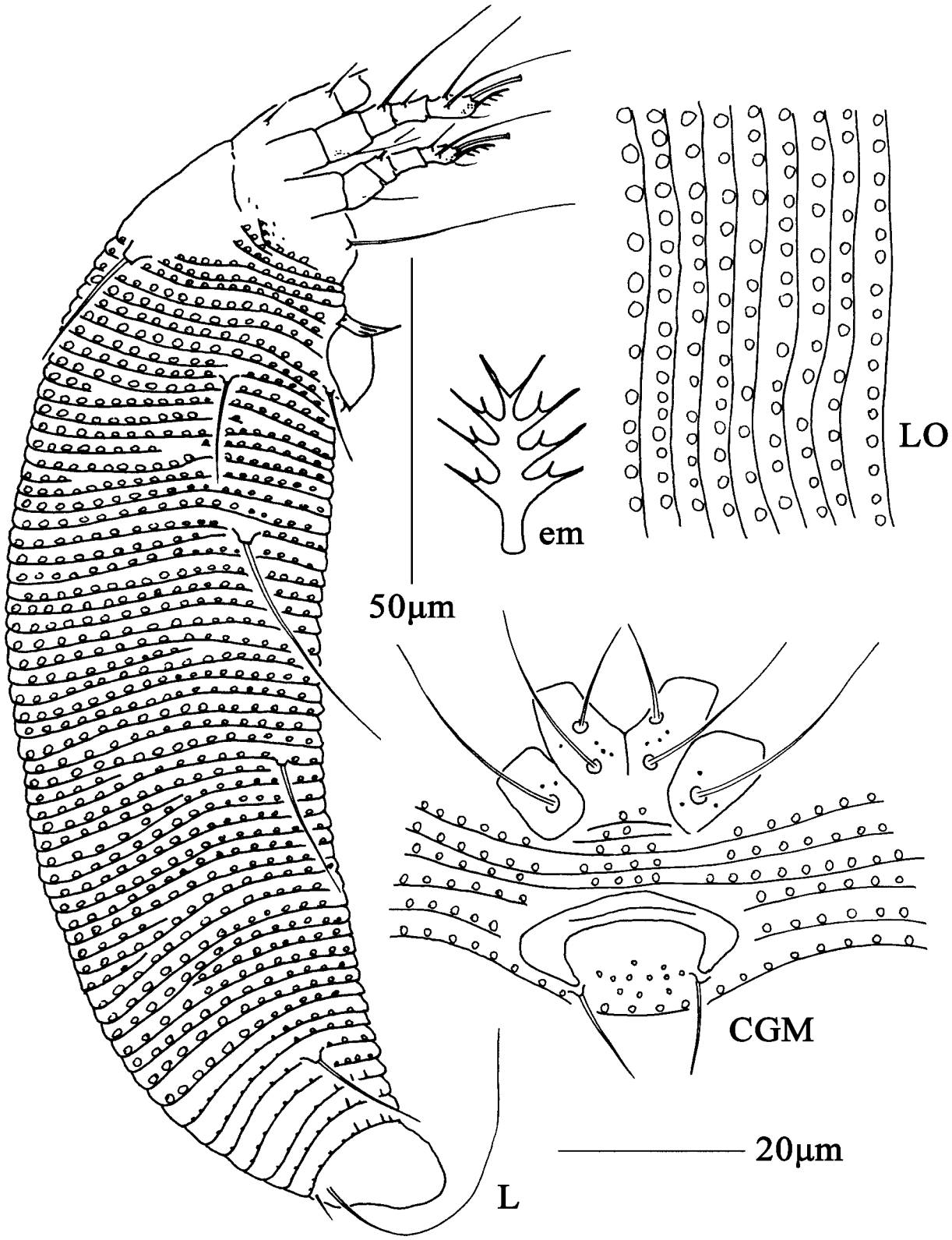

Fig. 8. *Aceria fraxinivora* (Nalepa, 1909) L. lateral view of female, LO. lateral microtubercles, CGM. coxae and male genitalia, em. empodium.

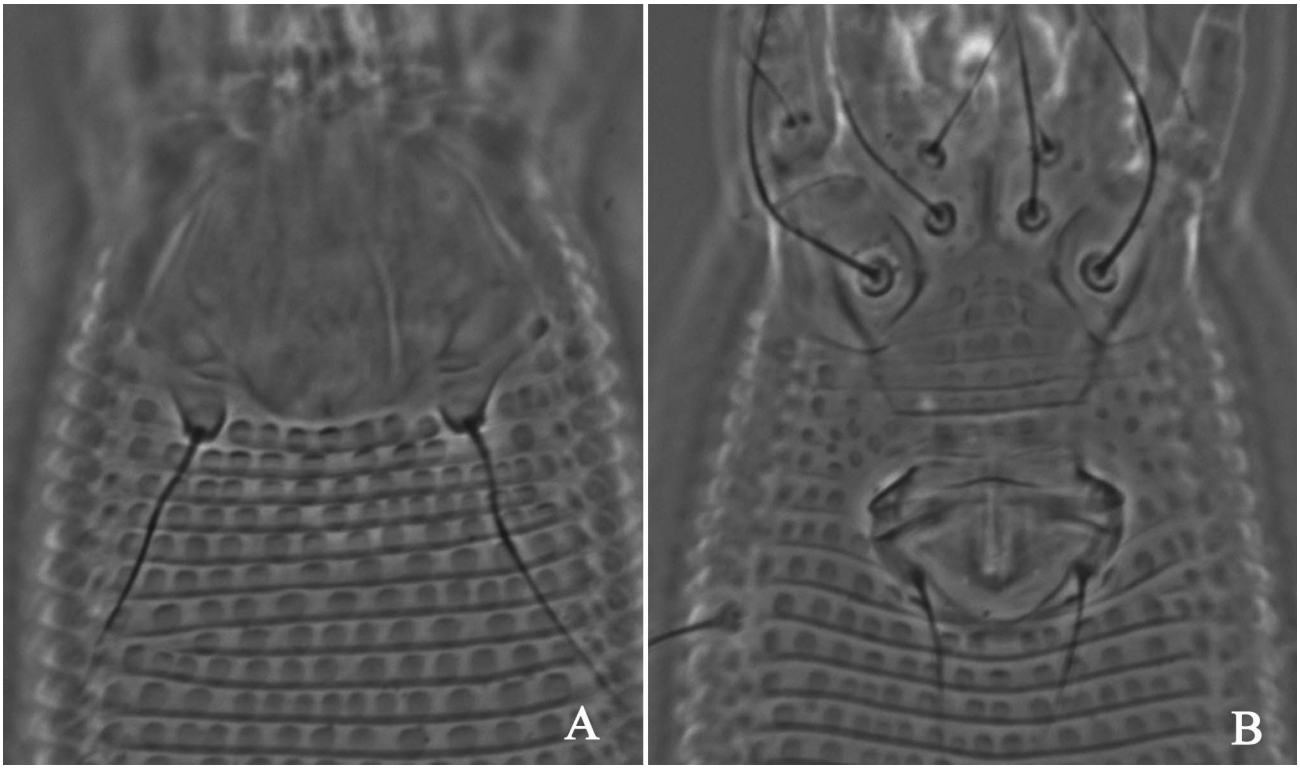

Fig. 9. *Aceria fraxinivora* (Nalepa, 1909) as viewed under 100× oil immersion, A. prodorsal shield, B. coxae and female genitalia.

6 (6–7). *Legs* with usual series of setae. Leg *I* 25 (24–26), femur 6 (6–7), basiventral femoral seta (*bv*) 7 (7–8); genu 3 (3–4), antaxial genual seta (*l″*) 18 (17–18); tibia 5 (5–6), paraxial tibial seta (*l′*) 3 (2–3), located at one-third from dorsal base; tarsus 5 (4–5), seta *ft′* 15 (15–17), seta *ft″* 16 (16–17), seta *u′* 3 (3–4); tarsal empodium (*em*) 5 (5–6), simple, four-rayed, tarsal solenidion (*ω*) 6 (6–7), little knobbed. Leg *II* 22 (22–24), femur 6 (6–7), basiventral femoral seta (*bv*) 6 (6–7); genu 3 (3–4), antaxial genual seta (*l″*) 6 (5–6); tibia 4 (3–4); tarsus 4 (4–5), seta *ft′* 5 (5–6), seta *ft″* 17 (16–17), seta *u′* 3 (3–4); tarsal empodium (*em*) 5 (4–5), simple, four-rayed, tarsal solenidion (*ω*) 7 (6–7), little knobbed. *Opisthosoma*: opisthosoma dorsally with 58 (58–59) annuli, with round microtubercles, last seven annuli with dot-like microtubercles, ventrally with 57 (56–57) annuli, with round microtubercles. Setae *c2* 13 (13–15) on ventral annulus 10, 32 (32–34) apart; setae *d* 33 (30–35) on ventral annulus 20 (18–21), 26 (25–26) apart; setae *e* 16 (15–16) on ventral annulus 34 (31–34), 10 (10–11) apart, setae *f* 15 (15–16) on fifth ventral annulus from rear, 15 (15–16) apart. Setae *h1* 3 (3–4), *h2* 35 (33–37). *Female genitalia* 11 (11–12), 20 (20–21) wide, coverflap with two transverse lines at base and eight longitudinal ridges, setae *3a* 10 (10–11), 12 (12–13) apart.

MALE – (*n* = 2) Body vermiform, 178–182, 36 wide, 40 thick; light yellow. *Gnathosoma* 17–18, projecting obliquely down, pedipalp coxal seta (*ep*) 3–4, dorsal pedipalp genual seta (*d*) 5–6, cheliceral stylets 15–16. *Prodorsal shield* 21–22, 26–27 wide; anterior shield lobe absent; with incomplete admedian lines. Scapular tubercles on rear shield margin, 18 apart, scapular setae (*sc*) 20–21, projecting posterior. *Coxal plates* with granules, anterolateral setae on coxisternum *I* (*1b*) 7, 7 apart, proximal setae on coxisternum *I* (*1a*) 12–13, 5 apart, proximal setae on coxisternum **II** (*2a*) 28–30, 14 apart. Prosternal apodeme 4. *Legs* with usual series of setae. Leg *I* 23–25, femur 5–6, basiventral femoral seta (*bv*) 5–6; genu 3–4, antaxial genual seta (*l″*) 5–6; tibia 3, paraxial tibial seta (*l′*) 2, located at one-third from dorsal base; tarsus 4, seta *ft′* 12–13, seta *ft″* 13–14, seta *u′* 2–3; tarsal empodium (*em*) 4–5, simple, four-rayed, tarsal solenidion (*ω*) 5–6, little knobbed. Leg *II* 22–23, femur 6, basiventral femoral seta (*bv*) 5–6; genu 3, antaxial genual seta (*l″*) 5–6; tibia 4; tarsus 4, seta *ft′* 5–6, seta *ft″* 16–17, seta *u′* 3; tarsal empodium (*em*) 4–5, simple, four-rayed, tarsal

solenidion (ω) 6–7, little knobbed. *Opisthosoma*: opisthosoma dorsally with 57–59 annuli, with round microtubercles, last seven annuli with dot-like microtubercles, ventrally with 58–60 annuli, with round microtubercles. Setae *c2* 15–16 on ventral annulus 9, 37 apart; setae *d* 33–34 on ventral annulus 18, 25 apart; setae *e* 10–11 on ventral annulus 33, 12 apart, setae *f* 16–17 on fifth ventral annulus from rear, 18 apart. Setae *h1* 2–3, *h2* 25–27. *Male genitalia* 23 wide, setae *3a* 12–13, 13 apart.

Material examined – Five females and two males (slide number Iran 51), from *Fraxinus excelsior* L. (Oleaceae), Ferdowsi University campus, Mashhad, Iran, 8-IX-2008, coll. Hussein Sadeghi, deposited in the Arthropod/Mite Collection of the Department of Entomology, Nanjing Agricultural University, Jiangsu Province, China. 23 specimens, from *Fraxinus excelsior* (Oleaceae), Ferdowsi University campus, Mashhad, Iran, 8-IX-2008, coll. Hussein Sadeghi, deposited in the Department of Plant Protection, Ferdowsi University of Mashhad, Iran.

Relation to host – This was found feeding in the male flowers of ash trees. Infested clusters were found deformed as green masses, which is the typical inflorescence galls caused by this species, and were seen on foliage throughout the growing season.

Host – *Fraxinus excelsior* L. (Oleaceae).

Habit – Flower galls.

Distribution – Iran, Finland, Austria.

Remarks – *Aceria fraxinivorus* (Nalepa, 1909) is similar to *Aceria fraxiniflora* (Felt, 1906), but can be differentiated from the latter by opisthosoma with 56–59 annuli (opisthosoma with 75–80 annuli in *A. fraxiniflora*), dorsal opisthosoma with last seven annuli with dot-like microtubercles (dorsal opisthosoma with last 3–5 annuli smooth in *A. fraxiniflora*), with five coxal-genital annuli (with eight coxal-genital annuli in *A. fraxiniflora*) and damages leaves and flowers (only damages flowers in *A. fraxiniflora*) (personal communication with Professor Amrine). Keifer *et al.* (1982), erroneously described *Aceria fraxiniflora* (Felt, 1906) as *Aceria fraxinivorus* (Nalepa, 1909). Baker *et al.* (1996) erroneously listed *Aceria fraxinivorus* (Nalepa, 1909) as a junior synynym of *Aceria fraxiniflora* (Felt, 1906).

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