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New eriophyoid mites occurring on perennial plants in Poland, with description of a new species *Neoleipothrix valerianae* (Acari: Eriophyoidea)

Grażyna Soika & Gabriel Łabanowski
Research Institute of Pomology and Floriculture, 96-100 Skierniewice, Poland, E-mail: gsoika@insad.pl

Abstract. *Neoleipothrix valerianae*, a new species feeding on *Valeriana officinalis* is described from central Poland. *Epitrimerus liroi* Roivainen, 1947 is transferred to the genus *Neoleipothrix.* Three mite species: *Aceria ajugae* (Nalepa, 1892), *A. eupatorii* Roivainen, 1953, and *Neoleipothrix liroi* (Roivainen, 1947) are recorded for the first time on perennial plants in Poland.

Key words: acarology, taxonomy, faunistics, new species, Eriophyoidea, *Aceria, Neoleipothrix,*, perennial plants

INTRODUCTION

Until now over 90 species of eriophyoid mites have been found on perennial plants in Poland (Skoracka et al. 2005). These mites live on the leaf surfaces or inside buds. Some of them do not cause significant damage to their hosts but others induce various kind of galls which they inhabit or cause discolouration of the affected foliage.

This paper presents the data on the occurrence of eriohyoid mites living on perennial plants in botanical gardens and ornamental nurseries located in different parts of Poland.

MATERIAL AND METHODS

In years 2000–2006 the observations were carried out on above 150 species of perennial plants in nurseries and botanical gardens located in different parts of Poland. The infested shoots and leaves were sampled from May to September. Mites were mounted

in Heinz media and studied under a phase–contrast microscope. All measurements are given in micrometers and were made at 1000 magnification. Type materials are deposited at the Research Institute of Pomology and Floriculture in Skierniewice.

RESULTS AND DISCUSSION

Four species of eriophyoid mites new to Polish fauna were found in collected samples. Three of them were recorded for the first time in Poland: *Aceria ajugae* (Nalepa, 1892), *Aceria eupatorii* Roivainen, 1953, and *Neoleipothrix liroi* (Roivainen, 1947). The fourth - *Neoleipothrix valerianae* n. sp. is new to science.

Aceria ajugae (Nalepa, 1891)

(Fig. 1)

Until now only one species *Aceria ajugae* was recorded on *Ajuga reptans* and *A. genevensis* (Amrine & Stasny 1996). This species was described from France by Nalepa (1910) on *Ajuga genevensis* and *A. reptans*. Recently, it was recorded also in Serbia by Petanović & Stanković (1999). They observed flower deformation induced by mites. Previous description of this species by Nalepa (1910) is incomplete. In Poland this species was found for the first time in 2000 on *A. reptans* (Soika et al. 2004). Detailed morphological description is given below.

Female: (n= 5). Body spindleform, whitish coloured. Body length 187.5-237.5; width 62-72. Gnathosoma 20 long, dorsal pedipalp genual setae 4-5 long; cheliceral stylets almost straight, 14-15 long. Prodorsal shield rhomboidal, without frontal lobe over gnathosoma, 41-42 long, 44-50 wide; Sculpture of prodorsal shield, median line present on rear half of shield, admedian lines from anterior margin diverging to rear, slightly concave in the middle, submedian lines in front part continuous and in back intermittent, dashed lines in front of conical of scapular setae present. Numerous, short lines present on surface rear part of shield. Tubercles of scapular setae ahead from rear margin of shield, 20-23 apart; scapular setae 15-17, projecting to rear.

Leg I 35-37 long; tibia 7-8 long with paraxial tibial seta 6-7. Tarsus 8 long; tarsal solenidion 10 long unknobbed, tarsal empodium simple 6-7 long, 4-rayed. Leg II 30-32 long; tibia 6-7 long. Tarsus 7-8 long; tarsal solenidion 9-10 long unknobbed; tarsal empodium 6-7 long.

Coxae with a pattern; on coxae I numerous short dashes disposed irregularly, on coxae II smooth surface. Sternal line clear, forked on both ends, 4-5 long. Anterolateral setae on coxisternum I 12-14 apart, 8-10 long, proximal setae on coxisternum I 8-10 apart, 17-20 long; proximal setae on coxisternum II 21-27 apart, 40-48 long.

Opisthosoma with 70-80 microtuberculate annuli. Microtubercles numerous, set along annuli margins. Lateral setae 15-17 long located on 12-14th ventral annulus; 1st ventral setae 40-45 long located on 26-28th annulus; 2nd ventral setae 8-12 long located on 44-47 ventral annulus; 3rd ventral setae 8-12 long on 6-7th annulus from the rear. Accessory setae 4-long.

Genital parts 18-22 long, 23-26 wide, genital coverflap with 8-12 ribs distally and dashed small transverse lines proximally; genital setae 10-15 long, 16-19 apart.

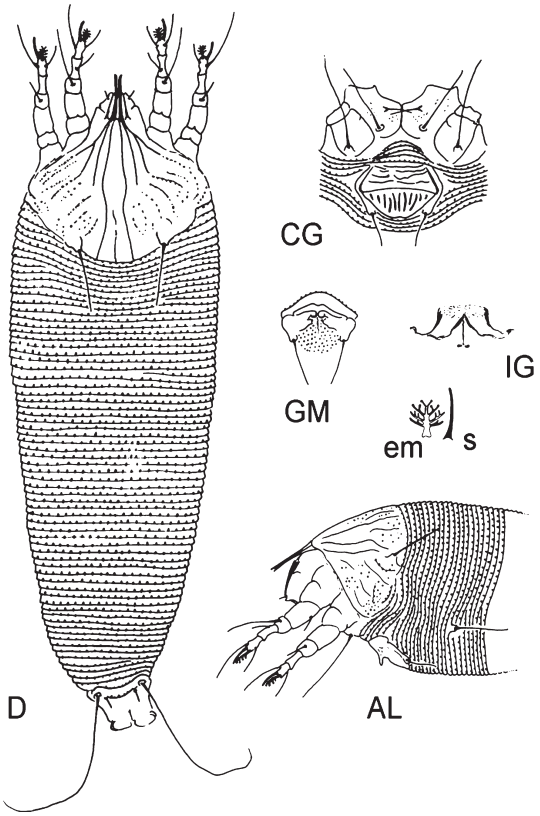
Male: (n=2); Body spindleform. Body length 197.5-202.5; width 60-65. Gnathosoma 20 long; chelicerae 15 long.

Prodosal shield 40-41 long, 45-47 wide. Shape and sculpture similar to that of female. Tubercles of scapular setae ahead rear margin of shield, setae 16-17 long, 23-24 apart; projecting to rear.

Opisthosoma with 68-69 microtuberculate annuli, Microtubercles numerous, set along annuli margins. Lateral setae 16-20 long located on 13th ventral annulus; 1st ventral setae 40 long located on 23-26th ventral annulus, 2nd ventral setae 8-12 long located on 44-47th ventral annulus; 3rd ventral setae 10-15 long on 7th annulus from the rear. Accessory setae 3-4-long.

Leg I 30-32; tibia 7 long, seta 7 long, tarsus 6-7 long; tarsal solenidion 9-10, tarsal empodium 6, 4-rayed simple. Leg II 32; tibia 5-6; tarsus 7; tarsal solenidion 10; tarsal empodium 6, 4-rayed.

Genital parts 23-24 wide, genital setae 15-17 long, tubercles 16-17 apart.



1. *Aceria ajugae*, female: D – dorsal aspect, IG – internal genitalia, CG – coxigenital region, GM – genital male, AL – anterior lateral body region, em – empodium, s-solenidion

Locality and date: Kraków - Botanical Garden on August 27, 2000, Warszawa - Botanical Garden on July 10, 2000, Rzeszów-commercial nursery on June 26, 2000 (SOIKA et al. 2004).

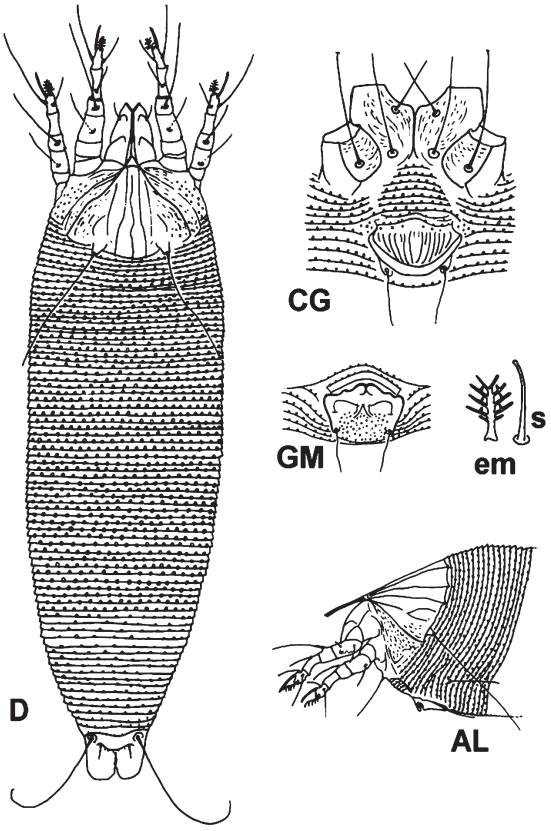
Host plant: *Ajuga reptans* L. (Lamiaceae)

Relation to host plant: mites live as vagrants on lower surface of the youngest leaves and causing discolouration and leaf edge rolling.

Aceria eupatorii ROIVAINEN, 1953

(Fig. 2)

Until now this mite was reported in Spain on *Eupatorium cannabinum* L. by ROIVAINEN (1953). The mite lives on apical leaves and causes rolling of margins of leaves and creates dense hairs on leaf surface. It was also found on *E. cannabinum* by PETANOVIĆ and STANKOVIĆ (1999) in Montenegro.



2. *Aceria eupatorii*, female: D – dorsal aspect, CG – coxigenital region, AL – anterior lateral body region, GM – genital male, em – empodium, s - solenidion

Female protogyne: (n=3). Body vermiform, whitish coloured. Body length 202.5-230; width 65-70.

Gnathosoma 22 -23 long, dorsal pedipalp genual setae 6-7 long; cheliceral stylets almost straight, 18 long. Prodorsal shield semicircular, without frontal lobe over gnathosoma, 32-34 long, 40 wide; Sculpture of prodorsal shield, median line present, running from anterior margin to rear one. Admedian lines complete, submedian lines short and subparallel to median line. Numerous broken lines and granules present in shield side. Tubercles of scapular setae on rear margin, 25 apart; setae 50-52, projecting to rear.

Leg I 33-35 long; tibia 8 long with paraxial tibial seta 7. Tarsus 8-9 long; tarsal solenidion 8-9 long unknobbed, tarsal empodium simple 6-7 long, 5-rayed. Leg II 27-30 long; tibia 6-7 long. Tarsus 7 long; tarsal solenidion 10 long unknobbed; tarsal empodium 6-7 long.

Coxae with a pattern; both on coxae I and on coxae II numerous short lines. Sternal line clear, forked on both ends, 9-10 long. Anterolateral setae on coxisternum I 10-11 apart, 9-10 long, proximal setae on coxisternum I 9-10 apart, 23-25 long; proximal setae on coxisternum II 25 apart 50-52 long.

Opisthosoma with 66-72 microtuberculate annuli. Microtubercles numerous, set along annuli margins. Lateral setae 20-23 long located on 12-13th ventral annulus; 1st ventral setae 53-60 long located on 27th annulus; 2nd ventral setae 14-15 long located on 44-45th ventral annulus; 3rd ventral setae 23-25 long on 5-6th annulus from the rear. Accessory setae 6-8 long.

Genital parts 18 long, 23-24 wide, genital coverflap with 14-16 ribs; genital setae 15-17 long, 18-19 apart.

Male: (n=1); Body spindleform. Body length 187.5; width 60. Gnathosoma 21 long; chelicerae 16 long.

Table I
Comparison of protogyne and deutogyne females of *Aceria eupatorii* collected in Poland.

	protogyne	deutogyne
Length of body	202.5-230	187.5-200
Length of scapular setae	50-52	60-65
No of annuli	66-70	64-66
Location of 1st ventral setae	27	22-24
Length of 2nd ventral setae	14-15	15-18
Location of 2nd ventral setae	44-45	35-38
Length of 3rd ventral setae	23-25	20-27
Length of leg I	33-35	38-40
Length of tibia I	8	8-10
Length of tarsus I	7-8	9
Length of leg II	27-30	35
Length of tibia II	6-7	8-9
Length of anterolateral setae on coxisternum I	9-10	10-12
Length of proximal setae on coxisternum II	50-52	43-55
No. of ribs on genital coverflap	14-16	12-14

Prodorsal shield 33 long, 35 wide. Shape and sculpture similar to that of female. Tubercles of scapular setae on rear margin of shield, scapular setae *35* long, 25 apart; projecting to rear.

Opisthosoma with 68 annuli, Annuli with numerous microtubercles, set along annuli margins. Lateral setae 20 long located on 12th ventral annulus; 1st ventral setae 40 long located on 21th annulus; 2nd ventral setae 15 long located on 36th ventral annulus; 3rd ventral setae 20 long on 7th annulus from the rear. Accessory setae 5 long.

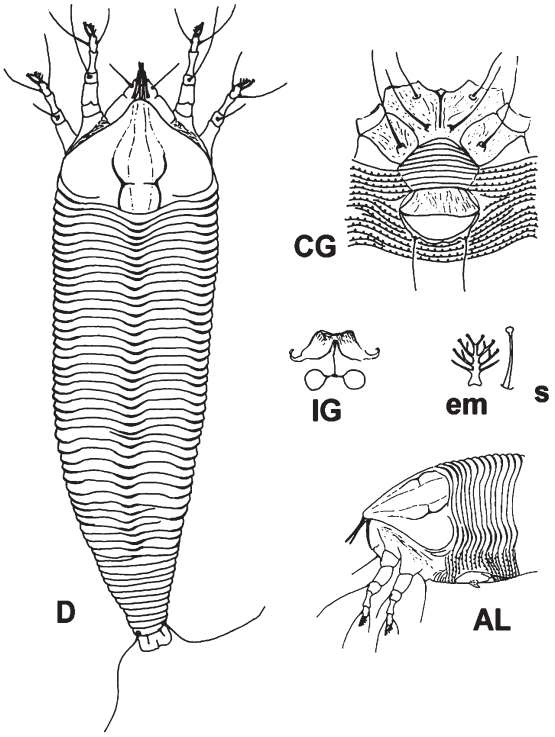
Leg I 37; tibia 8 long, paraxial tibial seta 5 long, tarsus 8 long; tarsal solenidion 9, tarsal empodium 6, 5-rayed simple. Leg II 30; tibia 6; tarsus 7; tarsal solenidion 11; tarsal empodium 6, 5-rayed

Genital parts 22 wide, genital setae 12 long, tubercles 17 apart.

We found also deutogyne females. They were differed from protogyne females by some characters, which were listed in table 1. Moreover, they differed in the appearance of microtubercles on annuli and pattern on dorsal shield. These characters of females protogyne are more distinguish in comparison to deutogyne ones.

Locality and date: Skierniewice, September 16, 1999; Warszawa – University Botanic Garden, July 12, 2001

Host plant: *Eupatorium purpureum* L.*; E. cannabinum* L. (Asteraceae)



3. *Neoleipothrix liroi*, female: D – dorsal aspect, IG – internal genitalia, CG– coxigenital region, AL – anterior lateral body region, em – empodium, s - solenidion

Relation to host plant: Mites live on the youngest leaves of *E. purpureum* causing considerable distortion of the affected foliage.

Neoleipothrix liroi (Roivainen, 1947) comb. n.

(Fig. 3)

Epitrimerus liroi Roivainen, 1947.

This mite was described by Roivainen (1947) from *Primula veris* L. in Finland and probably these were deutogyne females. Previous description of this species was incomplete and therefore the morphological characteristic is given below.

Female deutogyne: (n= 10). Body spindleform, amber coloured. Body length 230-272.5; width 79-84.

Gnathosoma 23-25 long, dorsal pedipalp genual setae simple 15-16 long; cheliceral stylets almost straight, 16-18 long. Prodorsal shield subrhomboidal, with frontal lobe over gnathosoma, 55-59 long, 67-70 wide; Sculpture of prodorsal shield: median line lack, admedian lines from anterior lobe base diverging to centre of shield and slightly concave on rear half one Tubercles of scapular setae situated ahead of rear shield margin, 18-20 apart; scapular setae 4-6, projecting to up centrally.

Leg I 40-41 long; tibia 9-11 long with paraxial tibial seta 3-5 long. Tarsus 7-8 long; tarsal solenidion 7 long knobbed, tarsal empodium simple 6-7 long, 4-rayed. Leg II 31-35 long; tibia 8-9 long. Tarsus 7-8 long; tarsal solenidion *7* long knobbed; tarsal empodium 6-7 long.

Coxae with numerous short lines. Sternal line, forked anteriorly, 10-13 long. anterolateral setae on coxisternum I 16-18 apart, 10-12 long, proximal setae on coxisternum I 8-9 apart, 25-35 long; proximal setae on coxisternum II 27-35 apart, 35-45 long.

Opisthosoma with 45-47 smooth dorsal annuli and 67-71 microtuberculate ventral annuli. Microtubercles numerous, set along annuli margins. Lateral setae 20-25 long located on 12-13th ventral annulus; 1st ventral setae 34-40 long located on 24-27th annulus; 2nd ventral setae 19-23 long located on 43-47th ventral annulus; 3rd ventral setae 26-38 long on 5-6th annulus from the rear. Accessory setae 3-5-long.

Genital parts 19-21 long, 23-25 wide, genital coverflap with numerous **dashed line** on surface; genital setae 17-18 long, 13-15 apart.

Locality and date: Rogów – Arboretum on April 25, 2000.

Host plant: *Primula veris* L. 'Cabrillo' (Primulaceae)

Relation to host plant: mites live as vagrants on lower surface of leaves that turn brown.

N*eoleipothrix valerianae* n. sp.

(fig.4)

Type material

Female holotype (Warszawa Botanical Garden, May 24, 1999); 74 female paratypes, 2 male paratypes, 2 nymph paratypes (Warszawa – University Botanic Garden, July

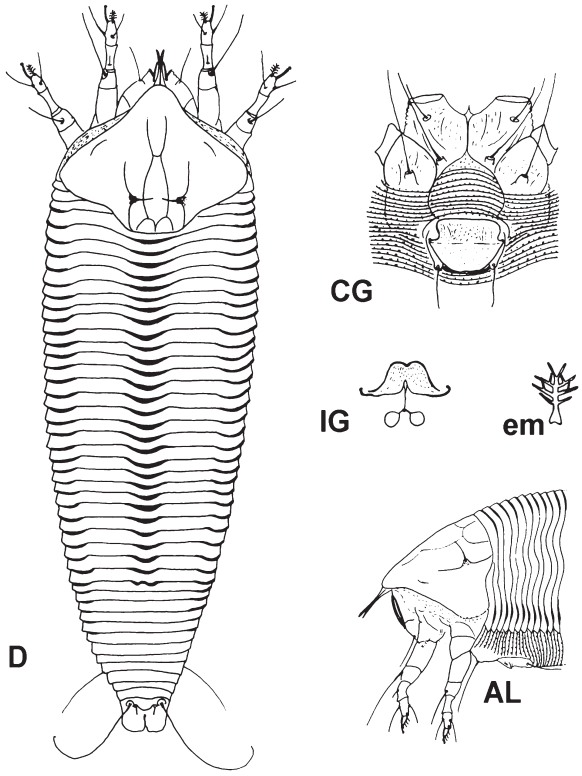
10, 2000, Warszawa Botanical Garden, May 24, 1999, Nowy Dwór n/Skierniewice, August 10, 1999).

Description

Female protogyne:(n= 10). Body spindelform, cream coloured. Body length 232.5 (202.5-237.5); width 78 (76-83).

Gnathosoma 23 (22-23) long, dorsal pedipalp genual setae simple 17 (15-17) long; cheliceral stylets almost straight 12 (12-13) long. Prodorsal shield almost triangular, with frontal lobe over gnathosoma 58 (55-58) long, 68 (65-70) wide; Sculpture of prodorsal shield, median line very short, present only in shield side. Admedian lines complete, curved, submedian lines running back on outer side of dorsal tubercles from about ½ on shield. Individual short curved line present in shield side. Tubercles of scapular setae ahead of shield margin, 17 (15-19) apart; scapular setae 5-7, directed up and centrally.

Leg I 40 (37-40) long; tibia 8 (8-9) long with paraxial tibial seta 4 (3-5). Tarsus 6-7 long; tarsal solenidion 6-7 long knobbed, tarsal empodium simple 6 long, 4-rayed.



4. *Neoleipothrix valerianae* n. sp., female: D – dorsal aspect, IG – internal genitalia, CG– coxigenital region, AL – anterior lateral body region, em - empodium

Leg II 35 (32-34) long; tibia 7-8 long. Tarsus 7 (6-7) long; tarsal solenidion 7 (6-7) long knobbed; tarsal empodium 7 (6-7) long.

Coxae with a pattern; both on coxae I and on coxae II present some dashes lines. Sternal line clear, forked on both ends, 10 long. Anterolateral setae on coxisternum I 21 (18-21) apart, 10 (10-11) long, proximal setae on coxisternum I 9 (7-11) apart, 19 (17-27) long; proximal setae on coxisternum II 29 (28-33) apart 35-45 long.

Opisthosoma with 49 (43-49) smooth dorsal annuli and 69 (65-71) microtuberculate ventral annuli. Microtubercles numerous, set along annuli margins. Lateral setae 20 (18-21) long located on 9-12th ventral annulus; 1st ventral setae 30 (27-30) long located on 27th (22-27) annulus; 2nd ventral setae 15 long located on 49th (42-50) ventral annulus; 3rd ventral setae 30 (25-30) long on 5th (5-6) annulus from the rear. Accessory setae 3 (3-4) long.

Genital parts 22 (20-22) long, 23 (23-25) wide, genital coverflap with longitudinal lines and granular; genital setae 15 (15-17) long, 16 (13-16) apart.

Male: (n=1); Body spindleform. Body length 165; width 59. Gnathosoma 21 long; chelicerae 12 long.

Prodorsal shield 51 long, 52 wide. Shape and sculpture similar to that of female. Tubercles of setae ahead on rear margin of shield, scapular setae *5* long, 13 apart; projecting up and centrally.

Opisthosoma with 44 dorsal annuli and 63 microtuberculate ventral annuli. Annuli with numerous microtubercles, set along annuli margins. Lateral setae 14 long located on 11th ventral annulus; 1st ventral setae 22 long located on 23th; 2nd ventral setae 13 long located on 40th ventral annulus; 3rd ventral setae 22 long on 5th annulus from the rear. Accessory setae 3 long.

Leg I 34; tibia 9 long, paraxial tibial seta 6 long, tarsus 6 long; tarsal solenidion 6 knobbed, tarsal empodium 6, 4-rayed simple. Leg II 30; tibia 7; tarsus 6; tarsal solenidion 7; tarsal empodium 6, 4-rayed

Genital parts 18 wide, genital setae 12 long, tubercles 11 apart.

Some of characters of deutogyne females are given in table II. These females were different in body length from protogyne females, length of prodorsal shield and lobe, length of tibia I and forecoxal setae I and forecoxal setae II. Moreover, they differed

Table II

Characteristics of protogyne and deutogyne females of *Neoleipothrix valerianae* n. sp collected in Poland.

	protogyne	deutogyne
Length of body	225-237.5	217.5-262.5
Length of prodorsal shield	55-58	63-70
Length of lobe	9-11	13-15
Dorsal tubercle apart	15-17	16-18
Length of tibia I	8-9	10-11
Length of antrolateral setae on coxisternum I	10-11	11-15
Length of proximal setae on coxisternum II	35-45	22-30

in the appearance of microtubercule on sternal annuli and pattern on the prodorsal shield.

Host plant: *Valeriana officinalis* (Valerianaceae)

Table III

Comparison of *Neoleipothrix valerianae* n. sp. found in Poland and *N. eupatorii* (Boczek & Petanović, 1994).

	N. valerianae n. sp. (n=10)	*N. eupatorii* (n=10)
Length of body	225-237,5	240 (177-268)
Width of body	79-83	75
Length of antapical setae	15-17	18
Length of p. shield	55-58	66 (64-69)
Length of lobe	9-11	10
Length of dorsal shield	5-7	5
Dorsal tubercles apart	15-17	16
No of dorsal annuli	42-49	42 (41-44)
No of central annuli	65-72	85
Length of sternum	10	9
Length of lateral s.	19-25	20
Location of lateral setae	9-12	21
Length of 1st ventral setae	27-30	32
Location of 1st ventral setae	22-30	21
Length of 3rd ventral setae	25-30	30
Location of 3rd ventral setae	5-6th from rear	6th from rear
Length of leg I	37-40	38
Length of tibia I	8-9	9
Length of tarsus I	6-7	6
Length of tarsal solenidion I	6-7	5
Length of tarsal empodium I	6	6
No. of rays of empodium .	4	4
Length of leg II	33-35	31
Length of tibia II	7-8	9
Length of tarsus II	6-7	6
Length of solenidion II	6-7	6
Tubercles of anterolateral setae on coxisternum I apart,	18-21	16
Length of anterolateral setae on coxisternum I	10-11	11
Tubercles of proximal setae on coxisternum I apart	7-11	7
Length of proximal setae on coxisternum I	35-45	20
Tubercles of proximal setae on coxisternum II apart	28-33	28
Length of proximal setae on coxisternum II	35-45	30
Length of genitalia	18-22	22
Width of genitalia	21-25	21
Length of genital setae	13-17	20
Genital tubercles apart	15-16	11

Relation to host plant: Mites live on lower side of leaves causing no visible damage.

Comparative notes

The protogyne female of new species is close to *N. eupatorii* (Boczek & Petanović, 1994), but it can be distinguished by the appearance of prodorsal shield, body width, prodorsal shield length, number of ventral annuli, length of solenidion I and legs II, proximal setae on coxisternum I, proximal setae on coxisternum II, genital setae and genital tubercles apart (tab. III).

Remarks

Until now only one species of eriophyoid mite – *Aceria macrotuberculatus* (Nalepa, 1895) was recorded on *Valeriana officinalis* L. (Valerianaceae) in Europe. In Poland the second species *N. valerianae* n. sp. is noted for the first time as living also on *V. officinalis.*

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