

Research article

## Ameroseiid mites (Acari: Ameroseiidae) in some parts of Iran with redescription of *Ameroseius lidiae* Bregetova

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**Abstract:** This paper reports some species of Ameroseiidae from various habitats in different parts of Iran. *Ameroseius bassolase* (Vargass, 2001) has been reported from Iran, but it was a misidentification of *Sertitympanum aegyptiacus* Nasr & Abow-Awad, 1984. Redescription of *Ameroseius lidiae* Bregetova, 1977 based on female specimens is also presented.

**Keywords:** Taxonomy, soil, mite, Mesostigmata, Ameroseiidae, Iran

### Introduction

Mites of the family Ameroseiidae Evans, 1961 have wide ranges of habitat. Some of them have established close phoretic relationships with other arthropods and, less commonly, with vertebrates. Species of Ameroseiidae representing the genera *Ameroseius* and *Hattena* have been collected from the heads of nectar-feeding birds in Australasia (Allred, 1970; Domrow, 1979). Members of this family have a wide range of terrestrial and above ground substrates, including moss, rotting straw, compost, manure, forest humus, decaying wood, bracket fungi, stored foods, and the nests of mammals, birds, and social insects; inflorescences may also be invaded (Evans and Till, 1979; Bregetova, 1977; Karg, 1993; Halliday, 1997). No observations have confirmed a predatory feeding behavior for any ameroseiid species. Some *Ameroseius* species are fungivorous associates of bracket fungi and the decaying wood of trees that have succumbed to attacks by bark- and wood-boring beetles (Westerboer and Bernhard, 1963; Lindquist *et al.* 2009). *Ameroseius* is the largest

genus of ameroseiid mites. Over 140 species are currently included in the genus (Beaulieu *et al.*, 2011; Halliday, 1997), 20 species of ameroseiid mites have been recorded in Iran (Hajizadeh *et al.*, 2013a; Hajizadeh *et al.*, 2013b; Kazemi and Rajaei, 2013; Nemati *et al.*, 2013). The Iranian mites of the family Ameroseiidae are poorly known. The only studies that have been done on this family are restricted to the lists of species with some distribution data (Hajizadeh *et al.*, 2013a; Kazemi and Rajaei, 2013; Nemati *et al.*, 2013) and redescription of *A. lanceosetis* Livshitz & Mitrofanov, 1975 (Hajizadeh *et al.*, 2013a). *Ameroseius lidiae* Bregetova, 1977 was described very briefly and inadequately based on specimens from mouth of Dnepr River in a hollow in a willow in USSR. The present information (Bregetova, 1977) about its morphological characters is very poor. In this paper some new distribution data of this family in Chaharmahal Va Bakhtiari, Esfahan and Khuzestan provinces, and redescription of *A. lidiae* are presented.

### Materials and Methods

Mites were collected from various habitats from different parts of Iran. Mites were extracted from samples using Berlese funnels, cleared in lactic acid at 55 °C and then mounted in Hoyer's

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medium on permanent microslides. Line drawings were made by use of a drawing tube and figures were performed with Corel X-draw software, based on the scanned line drawings. Measurements of structures were expressed as mean (minimum-maximum) ranges in micrometers ( $\mu\text{m}$ ). The dorsal setae notation followed that of Lindquist & Evans (1965). Length of the dorsal shield is the distance from its anteromedian edge anterior to bases of setae *jl* to its posteromedian edge posterior to bases of setae *Z5*; width of dorsal shield was measured at widest part; length of the sternal shield was measured along midline from anterior edge to its posterior margin, width measured between coxae I-II (widest point) and at the insertion of *st2*; The length of ventri-anal shield is midline from the anterior margin to the posterior edge of the cribrum, and width was measured at widest point. Setae were measured at level of insertions to their tips. Lengths of leg segments were measured dorsomedially, and tarsi were measured without the stalk and pretarsus. Specimens which this paper is based on are deposited in the Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord and some of them are deposited in Zoological museum, Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran. The coordinate information in the form of latitude and longitude were cited for ease of finding the place (city or region) of species collection and does not refer to the sampling location. Abbreviations used in the paper are as follows: F = female, M = male.

## Results

List of ameroseiid mites collected in this survey is as follows:

### *Sertitympanum aegyptiacus* Nasr & Abow-Awad, 1984

Chaharmahal va Bakhtiari province, Shahrekord (32° 19' 55" N 50° 51' 1" E, H: 2074 m), soil, 3F, coll. A. Nemati, 2007 and 1F, coll. A. Khalili-Moghadam, 2011; Saman (32° 27' 45" N 50° 55' 11" E, H: 1935 m), soil, 2F, coll. A. Nemati, 26.12.2006 and 26.12.2008; Farokhsahr (32° 16' 1" N 50° 58' 45" E, H: 2109 m), soil, 1F, coll. A.

Nemati, 10.4.2009; Boldaji, Choghakhor (31° 55' 12" N 50° 56' 31" E, H: 2298 m), decaying wood, 2F, coll. A. Khalili-Moghadam, 30.5.2013. Esfahan province, Esfahan (32° 38' 27" N 51° 47' 13" E, H: 1590), soil, 2F, coll. A. Nemati, 2007 and 2010. Khuzestan province, Izeh (31° 49' 52" N 49° 52' 9" E, alt 845 m), soil, 2F, coll. A. Nemati, 2011.

**Note:** *Ameroseius bassolase* (Vargass, 2001) was collected and recorded from Fars province (Marvdasht) in soil (Kazemi and Rajaei, 2013; Soleimani *et al.* 2011). We examined some specimens collected by Soleimani *et al.* (2011), and also other specimens which were collected in this survey. According to studied specimens, our data does not support this record and we believe that it was a misidentification of *S. aegyptiacus*.

### *Ameroseius corbiculus* (Sowerby, 1806)

Chaharmahal va Bakhtiari province, Shahrekord (32° 19' 55" N 50° 51' 1" E, H: 2074 m), soil, 1M, coll. A. Khalili-Moghadam, 2012; Boldaji and Choghakhor (31° 55' 12" N 50° 56' 31" E, H: 2298 m), decaying wood, 5F, coll., A. Khalili-Moghadam, 30.5.2013; Golestan province, Gorgan (36° 47' 30" N 54° 24' 10" E, H: 318 m), leaf litter, 2F, 1M, coll., A. Nemati, 2011.

### *Ameroseius plumosus* (Oudemans, 1902)

Chaharmahal va Bakhtiari province, Shahrekord (32° 19' 55" N 50° 51' 1" E, H: 2074 m), soil, 1F, coll., A. Khalili-Moghadam, 2008.

### *Epicriopsis horridus* (Kramer, 1876)

Golestan province, Gorgan (36° 47' 30" N 54° 24' 10" E, H: 318 m), leaf litter, 2F, coll., A. Nemati, 2011.

## Redescription

### Genus *Ameroseius* Berlese, 1904

Syn.: *Ameroseius* Berlese, 1904: 258. Type species: *Seius echinatus* C. L. Koch, 1839, by original designation (= *Acarus corbicula* Sowerby, 1806 = *Seius muricatus* Koch, 1839).

*Kleemannia* Oudemans, 1930: 135. Type species: *Zercon pavidus* Koch, 1839, by original designation. Synonymy by Westerboer & Bernhard, 1963.

*Primoseius* Womersley, 1956: 116. Type species: *Zercoseius macauleyi* Hughes, 1948, by original designation. Synonymy by Hughes, 1961.

**Genus diagnosis.** See Halliday (1997).

**Ameroseius lidiae** Bregetova, 1977 (Figures 1–12)

**Specimens examined.**

Chaharmahal va Bakhtiari province, Ben (32° 33' 44" N 50° 44' 13" E, H: 2218 m), soil, 6F; Hafshejan (32° 12' 58" N 50° 47' 29" E, H: 2048 m), rotting wood, 2F; Farokhshahr, Dezak (32° 16' 14" N 50° 58' 39" E, H: 2104 m), soil, 1F; Shahrekord (32° 20' 1" N 50° 51' 14" E, H: 2092 m), soil, 1F; Shahrekord, soil, 1F; Saman (32° 27' 31" N 50° 54' 49" E, H: 1927 m), soil, 1F.

**Female** (n = 5)

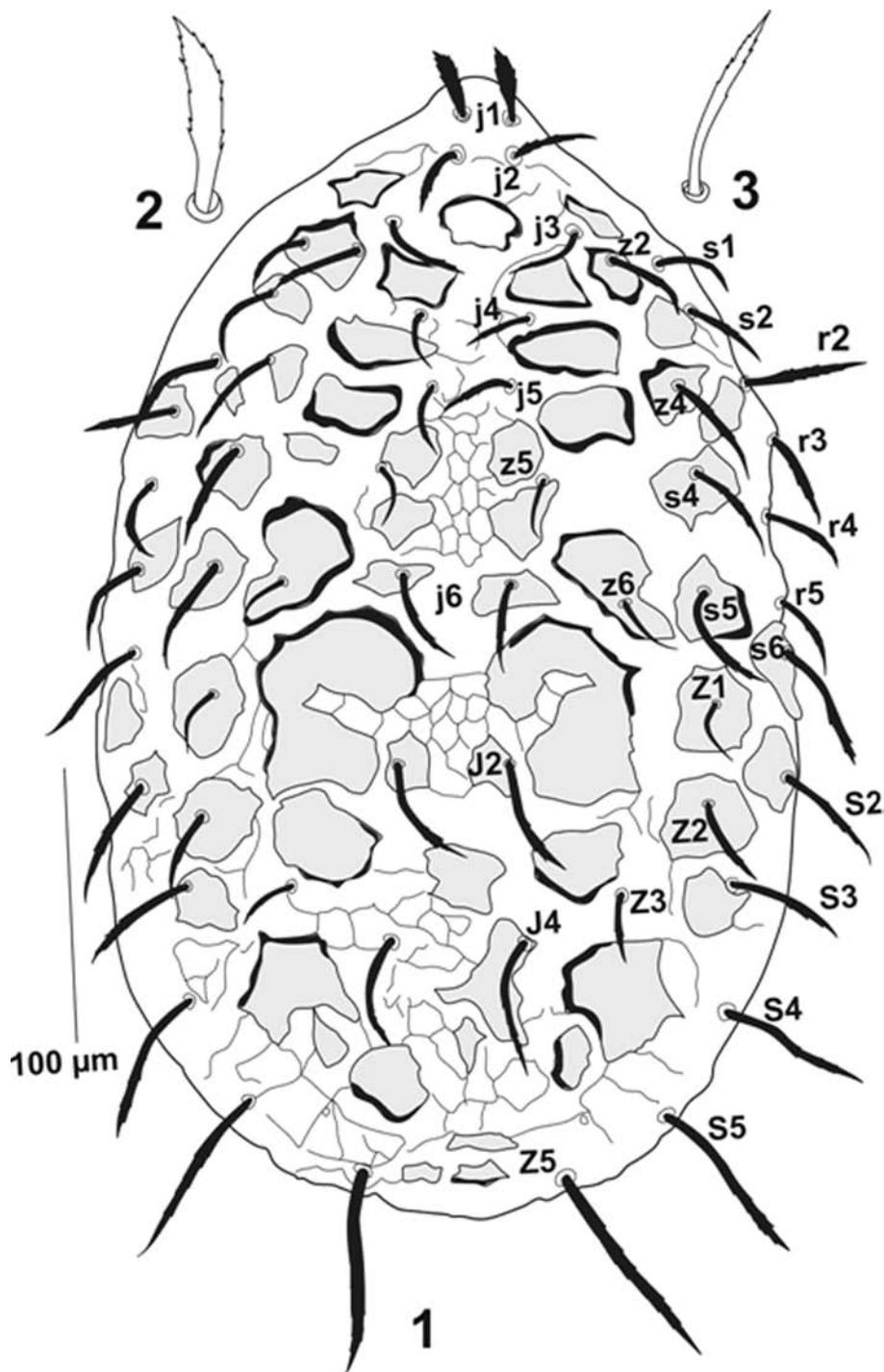
**Dorsal idiosoma.** Dorsal shield oval-shaped, 492 (473–510) long, width at level of setae *r3* 295 (286–307), (Fig. 1); entirely reticulated and with some deep depressions; with 29 pairs of setae, 19 pairs on podonotum (*j1-2*, *j4-6*, *z2-3*, *z5-6*, *s1-6*, *r2-5*) and 10 pairs on opisthonotum (*J2*, *J4*, *Z1-3*, *Z5*, *S2-5*) with *Z5* (Fig. 3) which is the longest. Seta *j1* (Fig. 2) slightly wider than the other dorsal setae and with distinct barbs. Dorsal setae vary in length (Table 1). Cuticle between dorsal and ventral sides of body bears no setae. Pore-like structures on podonotal and opisthonotal regions were not clear and not observed.

**Ventral idiosoma** (Fig. 4). Tritosternum with columnar base (8) and pilose laciniae 34 (31–37) which are fused along basal part for 20–22  $\mu$ m. Sternal shield smooth with only some lines in anterior and posterior parts, 69 (62–75) long at midline and 69 (62–73) wide at level of *st2* and 95 (88–104) at widest area adjacent to the anterior margins of coxae II, bearing two pairs of smooth setae, *st1* 25 (23–29) and *st2* 23 (21–24) and two pairs of angular lyrifissures (*iv1*, *iv2*). Third pair of lyrifissures (*iv3*) located interior to metasternal plates, setae *st3* 20 (18–21) located on two small plates adjacent to posterior margin of sternal shield and *st4* 16 (16–18) on soft cuticle near hyaline flap of genital shield. Genital shield reticulate, with nearly parallel margins, 100 (96–112) long and 70 (68–73) wide, slightly rounded posteriorly, bearing genital setae (*st5*) with 20 (18–23) long; a pair of pores (*gv2*, anterior) and a pair of lyrifissures (*iv5*, posterior) on soft cuticle postero-laterad of *st5*. Anal shield suboval and reticulate, 110 (104–114) long at midline and 139 (133–146) wide at the widest part; bearing one pair of para-anal setae 22 (21–23) and post-anal seta 20 (18–21), and wide

area of cribrum posterior to post-anal seta. Six pairs of opisthogastric setae (*Jv1–Jv5*, *Zv2*) smooth and acicular on soft cuticle. Opisthogaster surface with six pairs of lyrifissures and a pair of elongate metapodal platelets. Remnants of endopodal shield represented by a triangular platelet between coxae II and III, and a narrower, curved platelet between coxae III and IV. Exopodal shields not observed. Peritreme almost reaching level of setae *j1*. Peritrematal shield wide, with nearly wider area at level of coxae II–III, with one pair of pores at level of coxa III and on arc post-stigmatal plate.

**Gnathosoma.** Hypostome (Fig. 5) with 3 pairs of smooth simple setae; *h1* (16–17), *h2* (14–15) and *h3* (15). Deutosternal groove with seven rows of 2–4 denticles, the anterior-most with one tooth-like projection, the denticles of sixth row not discernible. Basal section of hypostome with two rows of denticles posterior to palp-coxal setae. Corniculi bifid. Epistome arc-shaped and with smooth anterior margin (Fig. 6). Fixed cheliceral digit 19 (16–20) long, with an apical tooth and three robust teeth, movable digit 21 (19–23) long and with one small subapical tooth, middle cheliceral segment 43 (31–50) long and with dorsal lyrifissure, dorsal seta not observed (Fig. 7). Palpcoxal setae 18–19 long. Palp chaetotaxy normal for the genus. Apotele three tined (Fig. 8).

**Legs.** Tarsi I–IV with claws and ambulacra. Setations of legs I–IV are as in figures (9–12). The chaetotaxy and the seta shapes of legs II and IV are as figures 9 and 12. **Leg I** (Fig. 9), 140 (136–147), coxa 21 (20–25), trochanter 11 (9–15), basi-femur (6–7), telo-femur 20 (18–22), genu 19 (18–21), tibia 19 (17–21), tarsus 42 (41–44); **leg II** (Fig. 10), 120 (113–138) (excluding stalk and pretarsus), coxa 14 (12–15), trochanter 15 (13–17), basi-femur (7–9), telo-femur 17 (15–19), genu 15 (13–20), tibia 14 (11–20), tarsus 37 (31–44); **leg III** (Fig. 11), 112 (106–118) (excluding stalk and pretarsus), coxa 13 (12–14), trochanter 15 (12–16), basifemur 8 (6–9), telofemur (14–15), genu 13 (12–14), tibia 12 (10–14), tarsus 36 (35–38); **leg IV** (Fig. 12), 137 (115–154) (excluding stalk and pretarsus), coxa 14 (12–18), trochanter 19 (15–21), basifemur (9–11), telofemur 19 (15–21), genu 16 (14–19), tibia 16 (13–19), tarsus 43 (37–47). Legs I and IV longer than legs II and III.



Figurers 1-3 *Ameroseius lidiae* Bregetova, 1997 (female): 1. Dorsal shield, 2. j1, 3. Z5.

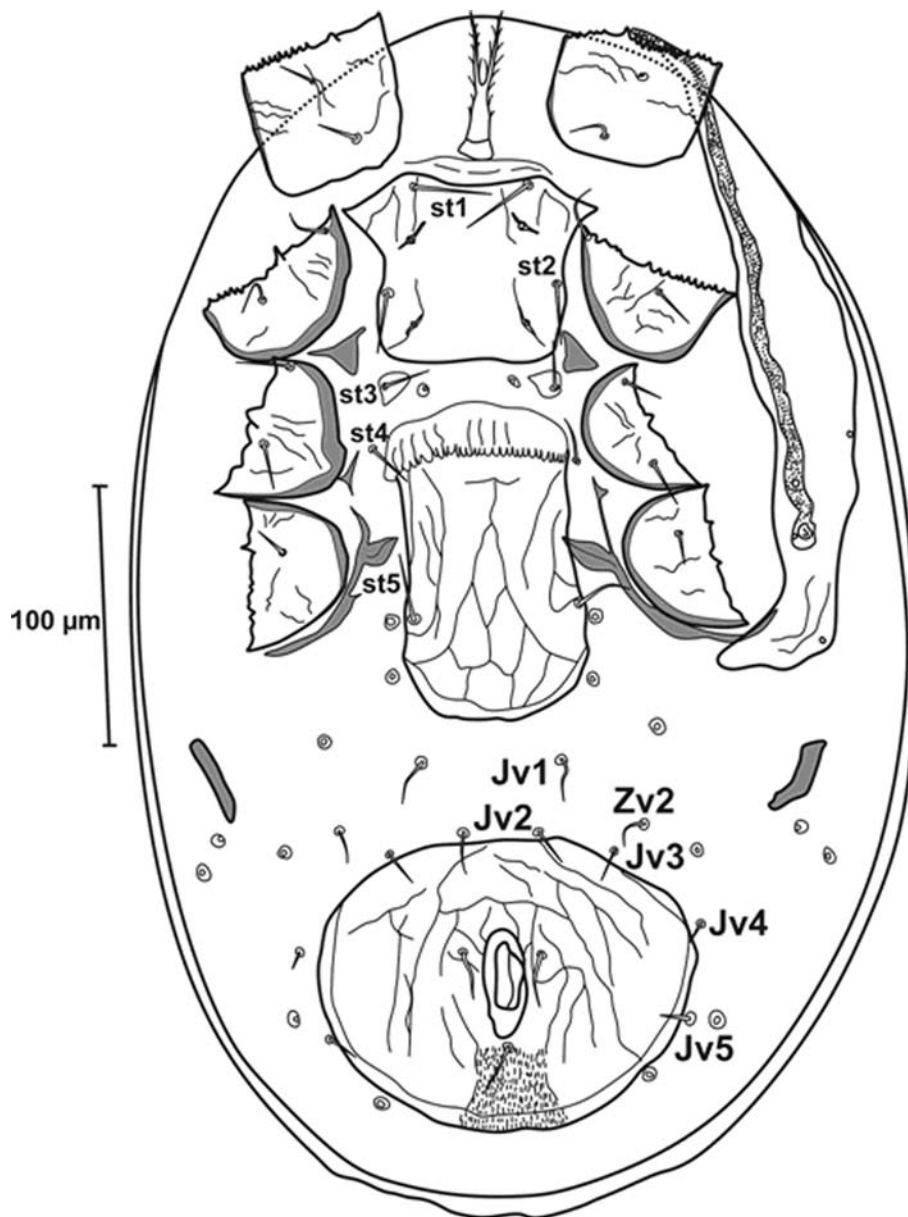
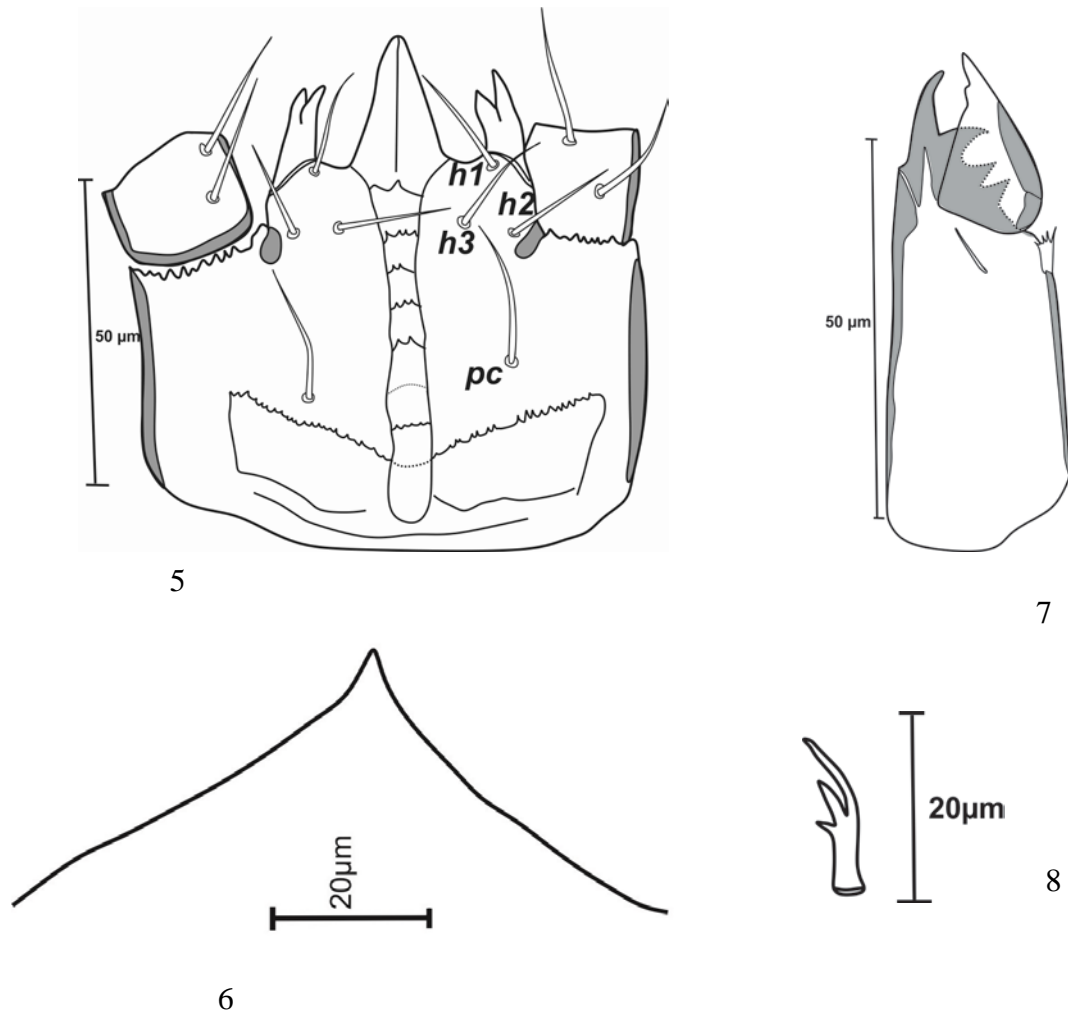
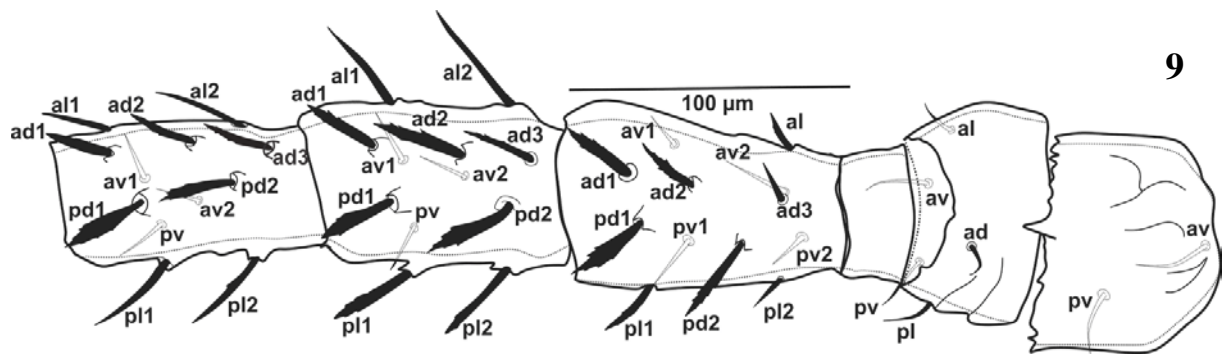


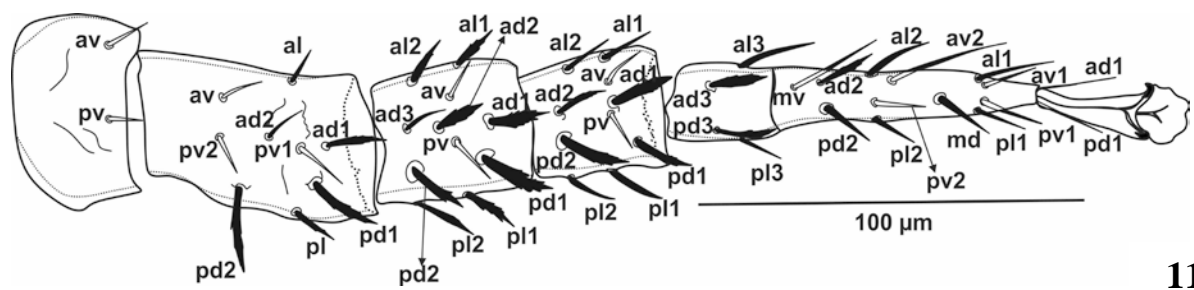
Figure 4 Ventral idiosoma of *Ameroseius lidiae* Bregetova, 1997 (female).



Figures 5-8 *Ameroseius lidiae* Bregetova, 1997 (female): 5. Hypostome, 6. Epistome, 7. Chelicera, 8. Apotele.

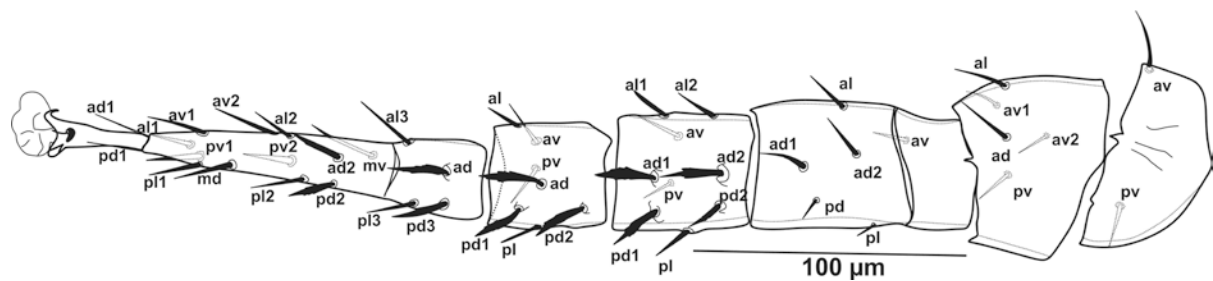


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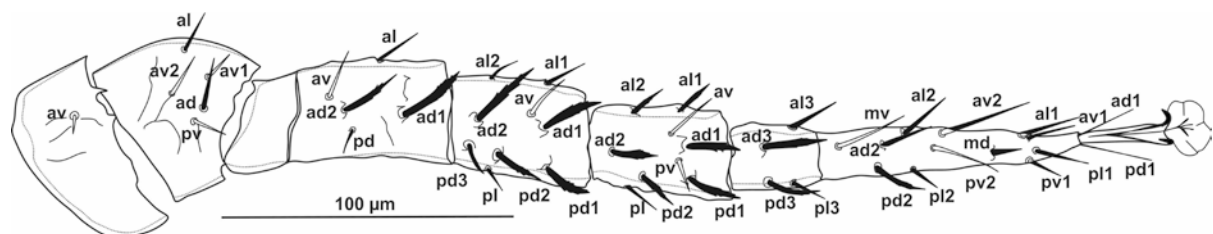


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Figures 9-12 *Ameroseius lidiae* Bregetova, 1997 (female): 9. Leg I, 10. Leg II, 11. Leg III, 12. Leg IV.

**Table 1** Measurements of dorsal setae of *Ameroseius lidiae* Bregetova, 1977 (n = 5).

Podonotum							
j1	26-27	z2	32-43	s1	26-35	r2	41-47
j2	23-33	z4	29-41	s2	33-35	r3	27-38
j3	26-33	z5	21-23	s4	35-43	r4	29-38
j4	23-27	z6	23-27	s5	32-50	r5	32-40
j5	20-29			s6	43-47		
j6	27-38						
Opisthonotum							
J2	44-49	Z1	23-30	S2	43-47		
J4	38-45	Z2	30-41	S3	41-44		
		Z3	24-29	S4	43-55		
		Z5	61-73	S5	55-68		

**Remark**

*Ameroseius lidiae* is similar to *A. corbicula* (Sowerby, 1806) but it may be differentiated from the latter according to the following characters. In *A. corbicula* dorsal setae are robust, seta *j1* is about four times as wide as *j2*. Setae in *j* and *J* series are long enough that the tip of seta *J4* extends to the posterior margin of dorsal shield; seta *J2* well extended posterior to the base of *J4*, seta *j6* reaches to the base of *J2*, while in *A. lidiae* dorsal setae are slender and shorter, seta *j1* is about two times as wide as *j2*. The tip of *j6*, *J4* and *J2* extended to the midpoint of the distance between the base of *j6*-*J2* *J4*-*Z5* and *J2*-*J4* respectively.

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## کنه‌های خانواده Ameroseiidae (Acari: Mesostigmata) در بخش‌هایی از ایران و باز توصیف گونه *Ameroseius lidiae* Bregetova

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**چکیده:** در این مقاله گونه‌هایی از خانواده Ameroseiidae از زیستگاه‌های مختلف از بخش‌های مختلف ایران گزارش می‌شود. گونه *Sertitympanum aegyptiacus* Nasr & Abow-Awad به اشتباه با عنوان *Ameroseius bassolase* (Vargass, 2001) از ایران گزارش شده است که در این مقاله تصحیح می‌شود. بازتوصیف گونه *Ameroseius lidiae* Bregetova براساس نمونه‌های ماده ارایه می‌شود.

**واژگان کلیدی:** تاکسونومی، خاک، کنه، میان‌استیگمایان، Ameroseiidae، ایران