

FIRST RECORD OF ADAMYSTIDAE (ACARI: PROSTIGMATA) FROM RUSSIA

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ABSTRACT: The family Adamystidae is reported from Russia for the first time. Female and male specimens of *Adamystis burjaticus* sp.n. collected from soil and litter in Buryatia are described. This species is new to science. A female of *Adamystis saboorii* collected from soil in the Altai Republic is recorded from Russia for the first time.

KEY WORDS: Acarina, Adamystoidea, systematics, morphology, new species, Altai Mountains, Buryatia

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INTRODUCTION

The mite family Adamystidae (Acari: Prostigmata) comprises one genus *Adamystis* Cunliffe, 1957 and 20 described species (Paktinat-Saeij and Kazemi 2021). All Adamystidae are free-living predators (Walter *et al.* 2009). Adamystidae have been reported from France, Iran, Pakistan, South Africa, Tajikistan, Thailand, Ukraine, the USA and Uzbekistan (Cunliffe 1957; Hunter and Crossley 1968; Coineau 1974; Rafalski 1982; McDaniel and Bolen 1983; Barilo 1987; Ueckermann 1989; Pogrebnyak 2007; Fuangarworn and Lekprayoon 2010; Beyzavi *et al.* 2012; Fuangarworn *et al.* 2012; Khanjani *et al.* 2012; Ghasemi-Moghadam *et al.* 2019; Paktinat-Saeij *et al.* 2019; Paktinat-Saeij and Kazemi 2021). Paktinat-Saeij and Kazemi (2021) have provided the latest key to the species of *Adamystis*.

During soil zoological expeditions to the Altai and Buryatia, we found one new and one newly recorded species of *Adamystis*. The family Adamystidae is reported from Russia for the first time.

MATERIALS AND METHODS

Mites were collected from samples of soil, litter, and mosses using Berlese funnels and mounted in Hoyer's medium. In the description below, notations applied to the body and leg setae follow that of Grandjean's system, overviewed by Kethley (1990) and Norton (1977), respectively. All measurements for the holotype and the paratypes (in parentheses) are given in micrometers (µm). In the descriptions of leg setation, the number of solenidia and famuli are given in parentheses. Mite morphology was studied using a Carl Zeiss AxioImager A2 compound microscope with a phase contrast and DIC objectives.

SYSTEMATICS

Family Adamystidae Cunliffe, 1957

Genus *Adamystis* Cunliffe, 1957

Type species: *Adamystis donnae* Cunliffe, 1957, by original designation.

Adamystis burjaticus sp.n.

(Figs. 1–5)

Description. *Female* (Figs. 1, 2A–C, 3–5). Idiosoma broadly ovate. Length of idiosoma (including naso) 690 (545–690), maximum width 480 (420–480).

Idiosomal dorsum (Figs. 1A, 2A). Dorsal shield large, distinctly reticulate, with eight pairs of setae (*ve*, *sci*, *sce*, *c1*, *c2*, *d*, *e*, *f*); posterior margin of dorsal shield concave. Naso reticulate. All dorsal setae blunt-tipped; setae *sci* weakly blunt-tipped; setae *sci* smooth, other dorsal setae weakly barbed. One pair of ocelli located laterad setae *sce*; postocular bodies large, round, located just posteriad ocelli. Setae *h1*, *h2* and *ps1–3* located on separate reticulate plates; one specimen with small unpaired platelet posteriad dorsal shield and with additional seta *h2* on right side (Fig. 2A). Lyrifissures *1a*, *im* and *ip* located on dorsal shield; lyrifissure *ih* located laterad setae *h2*. Lens-like structures absent. Lengths of dorsal setae: *vi* 50 (49–52), *ve* 47 (45–48), *sci* 55 (54–56), *sce* 26 (25–26), *c1* 27 (25–27), *c2* 26 (24–26), *d* 28 (25–28), *e* 26 (24–26), *f* 24 (24–25), *h1* 21 (21–23), *h2* 22 (21–22), *ps1* 22 (21–22), *ps2* 22 (21–22), *ps3* 22 (22–23).

Idiosomal venter (Figs. 1B, 2A, B). Coxisternal plates separated medially, reticulate, with 22 pairs of filiform setae (including coxal setae). Four pairs of aggenital setae, each seta on separate reticulate

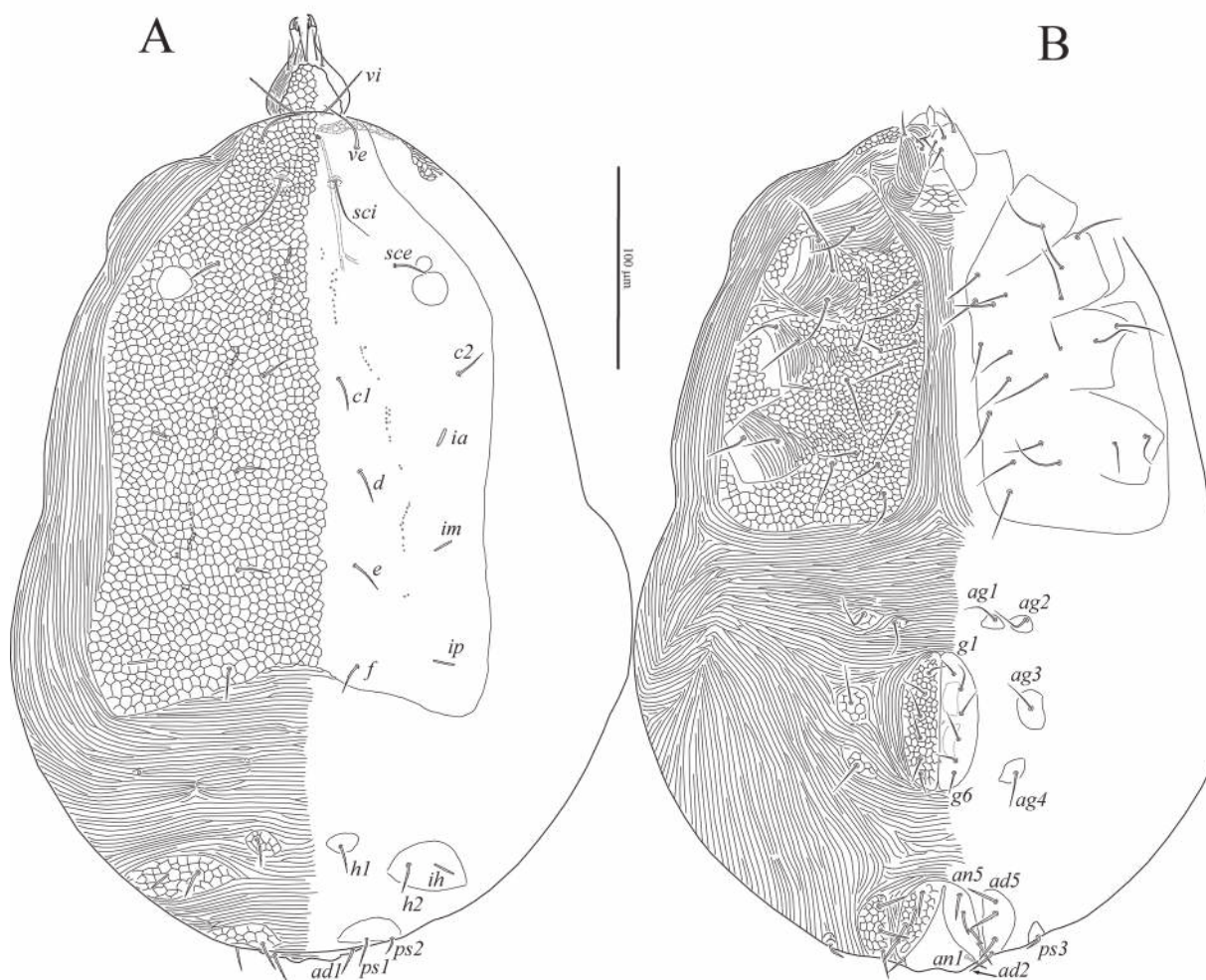


Fig. 1. *Adamystis burjaticus* sp. n., female: A—dorsum of body, B—venter of body. Legs and palps omitted.

platelet; usually with six pairs of genital setae; in one specimen seven pairs of genital setae (Fig. 2C); another specimen with asymmetric number of genital setae (5+6). Setae *ad1*–5 and *an1*–5 located on separate reticulate plates. Usually with five pairs of adanal and anal setae each; some specimens with four pairs of adanal setae; one specimen with six pairs of anal setae. Shape of adanal and anal setae same as dorsal hysterosomal setae. Triangular area just posteriad subcapitulum clearly reticulate. Internal genitalia with two pairs of large oval and subequal genital acetabula; two pairs of short and blunt-tipped acetabular setae (*k1*, *k2*) and two pairs of tiny and pointed eugenital setae (*eu1*, *eu2*) (Fig. 2B). Lengths of ventral setae: *ad1*–5 22–24, *an1*–5 20–22.

Gnathosoma (Fig. 3). Chelicerae with two pairs of smooth and pointed setae (*cha*, *chb*); Palp 130 (120–130) long; four-segmented; trochanter short without setae; femurogenu with two barbed setae; tibia with three barbed setae; tarsus with

one solenidion ω 12 long, five eupathid-like setae and four simple setae. Subcapitulum striated, with four pairs of setae (probably subcapitular *m*, *n* and adoral *or1*, *or2*) (Fig. 3B). Peritremes wide, reticulate; trachea long, with small sclerotized sac-like atrium.

Legs (Figs. 4, 5). Lengths of legs: I 385 (365–390), II 395 (365–395), III 405 (375–415), IV 450 (430–470). All femora subdivided; line between basi- and telofemur clearly visible only ventrally. Leg I (Figs. 4A, 5A). Coxae I posterodorsally with short peg-like leg supracoxal setae (*el*). Leg setation: Tr 1 (*l'*), Fe 7/5 (*d*, *l'*, *l''*, *v'*, *v''*, *l'1*, *l''1/d1*, *l'2*, *l''2*, *v'1*, *v''1*), Ge 7(1) (*d*, *l'*, *l''*, *v'*, *v''*, *l'1*, *l''1*, σ), Ti 12(1) (*d* ζ , *l'*, *l''*, *v'* ζ , *v''* ζ , *k*, *v'1*, *v''1*, *l'1*, *l''1*, *v'2*, *v''2*, ϕ), Ta 27(2) (*p'* ζ , *p''* ζ , *tc'* ζ , *tc''* ζ , *ft'* ζ , *it'* ζ , *it''* ζ , *u'*, *u''*, *a'* ζ , *a''*, *pl'*, *pl''*, *vs* ζ , *pv'* ζ , *pv''* ζ , *l'*, *l''*, *v'* ζ , *v'1*, *v''1*, *l'1*, *l''1*, *l'2*, *l''2*, *v'2*, *v''2*, ω , ϵ). Setae *k* of tibia smooth, slightly widened in basal half; setae *p'* ζ , *p''* ζ , *tc'* ζ , *tc''* ζ , *ft'* ζ , *it'* ζ , *it''* ζ , *a'* ζ , *vs* ζ ,

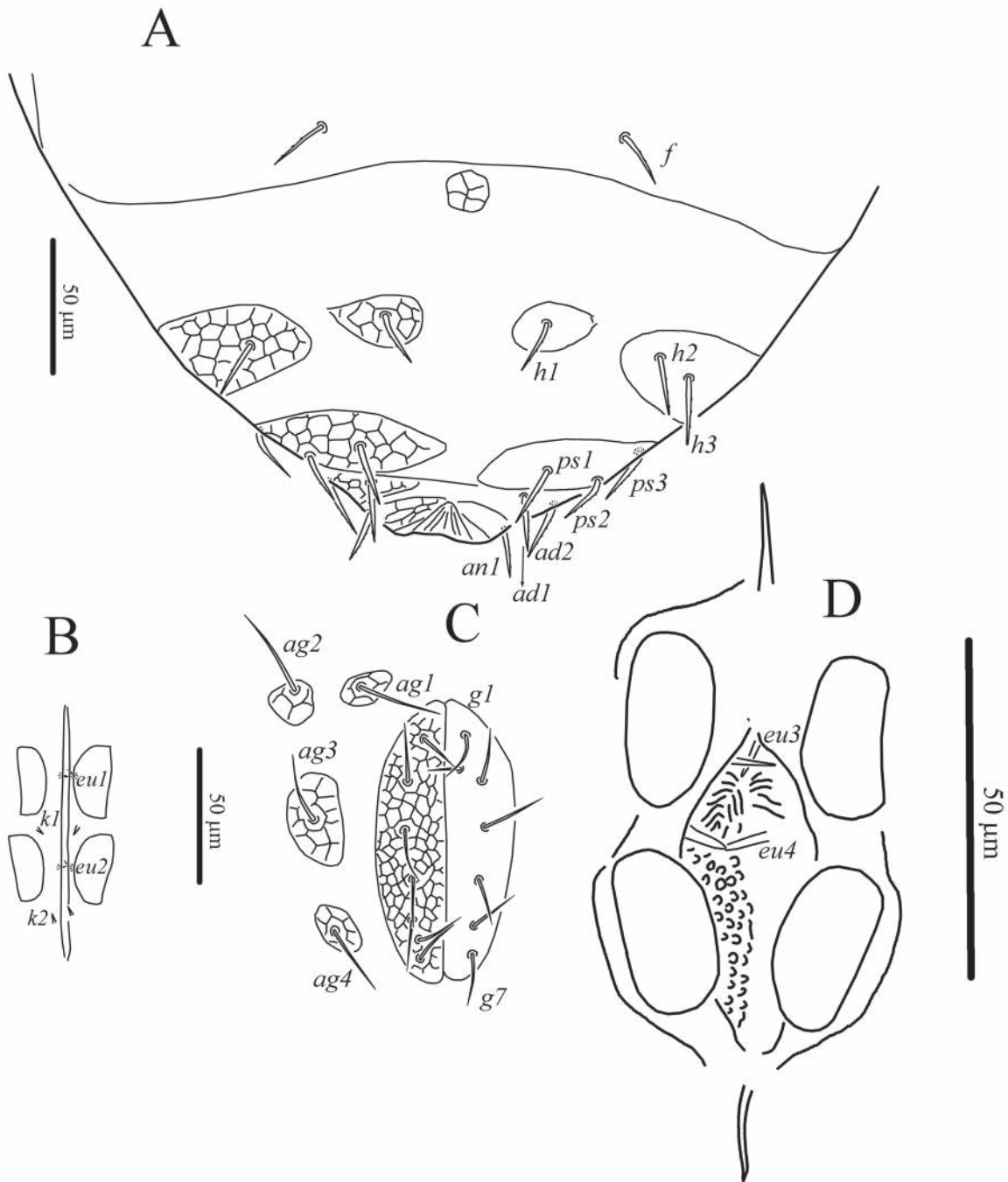


Fig. 2. *Adamystis burjaticus* sp.n., female: A—dorsum of opisthosoma with abnormal presence of unpaired platelet posterior dorsal plate and additional seta *h3*, B—internal genitalia, C—genital area of specimen with seven pairs of genital setae; male: D—internal genitalia. Setae *eu1*–*2* and *k1*–*2* not illustrated.

pv'ζ, pv''ζ, v'ζ of tarsus, *dζ, v'ζ, v''ζ* of tibia blunt-tipped, smooth or weakly barbed, eupathid-like; other setae pointed, smooth or sparsely barbed. Famulus ϵ very small, hardly visible, located anteriorly to solenidion ω ; all solenidia uniformly thin; solenidion ω 19 (17–19); solenidion φ 14 (10–14); solenidion σ 18 (17–19). Leg II (Figs. 4B, 5B). Leg setation: Tr 2 (*l', v'*), Fe 7/5 (*d, l', l'', v', v'', l'1, l''1/d1, l'2, l''2, v'1, v''1*),

Ge 7(1) (*d, l', l'', v', v'', l'1, l''1, σ*), Ti 11(1) (*dζ, l', l'', v'ζ, v''ζ, v'1, v''1, l'1, l''1, v'2, v''2, φ*), Ta 27(2) (*p'ζ, p''ζ, tc'ζ, tc''ζ, ft'ζ, it'ζ, u', u'', a'ζ, a'', pl', pl'', vsζ, pv'ζ, pv''ζ, l', l'', v'ζ, v''ζ, v'1, v''1, l'1, l''1, l'2, l''2, v'2, v''2, ω, ε*). Setae *p'ζ, p''ζ, tc'ζ, tc''ζ, ft'ζ, it'ζ, a'ζ, vsζ, pv'ζ, pv''ζ, v'ζ, v''ζ* of tarsus, *dζ, v'ζ, v''ζ* of tibia blunt-tipped, smooth or weakly barbed, eupathid-like; other setae pointed, smooth or sparsely barbed.

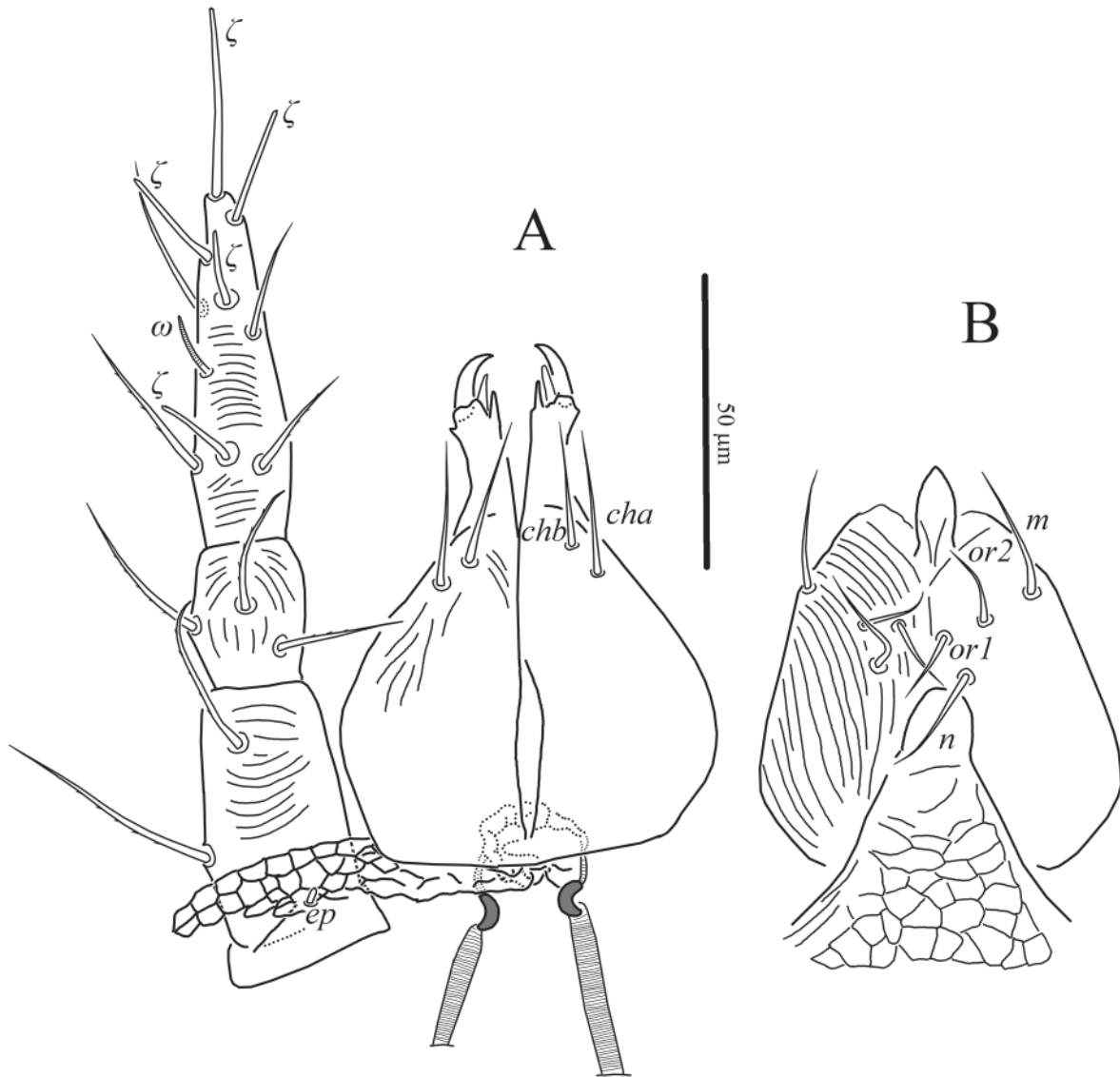


Fig. 3. *Adamystis burjaticus* sp.n., female: A—gnathosoma, dorsal aspect; B—subcapitulum.

Famulus ε very small, hardly visible, located anteriorly; all solenidia uniformly thin; solenidium ω 16 (15–17); solenidium φ 10 (8–10); solenidium σ 19 (18–19). Leg III (Figs. 4C, 5C). Leg setation: Tr 2 (l', v'), Fe 7/4 ($d, l', l'', v', l'1, l'1/d1, l'2, v'1, v'1$), Ge 7(1) ($d, l', l'', v', v'', l'1, l'1, \sigma$), Ti 11(1) ($d, l', l'', v'\zeta, v'', v'1, v'1, l'1, l'1, v'2, v'2, \varphi$), Ta 24 ($p'\zeta, p''\zeta, tc'\zeta, tc'', ft', ft'', u', u'', a'\zeta, a'', pl', vs\zeta, pv'\zeta, pv''\zeta, l', l'', v'\zeta, v''\zeta, v'1, v'1, l'1, l'1, v'2, v'2$). Setae $p'\zeta, p''\zeta, tc'\zeta, a'\zeta, vs\zeta, pv'\zeta, pv''\zeta, v'\zeta, v''\zeta$ of tarsus, and $v'\zeta$ of tibia blunt-tipped, smooth or weakly barbed, eupathid-like; other setae pointed,

smooth or sparsely barbed. All solenidia uniformly thin; solenidium φ 8 (7–8); solenidium σ 17 (17–18). Leg IV (Figs. 4D, 5D). Leg setation: Tr 1 (v'), Fe 4/2 ($d, l', l'', v', /dl, v'1$), Ge 6 ($d, l', l'', v', l'1, l'1$), Ti 10 ($d, l', l'', v'\zeta, v'', v'1, l'1, l'1, v'2, v'2, \varphi$), Ta 19 ($p', p'', tc'\zeta, tc'', ft', ft'', u', u'', a'', vs\zeta, pv', pv'', l', l'', v''\zeta, v'1, v'1, v'2, v'2$). Setae $tc'\zeta, vs\zeta, v''\zeta$ of tarsus blunt-tipped, weakly barbed, eupathid-like; other setae pointed, smooth or sparsely barbed.

Male (Fig. 2D). In general, male is almost indistinguishable from female except internal genitalia. Besides two pairs of acetabular and two pairs

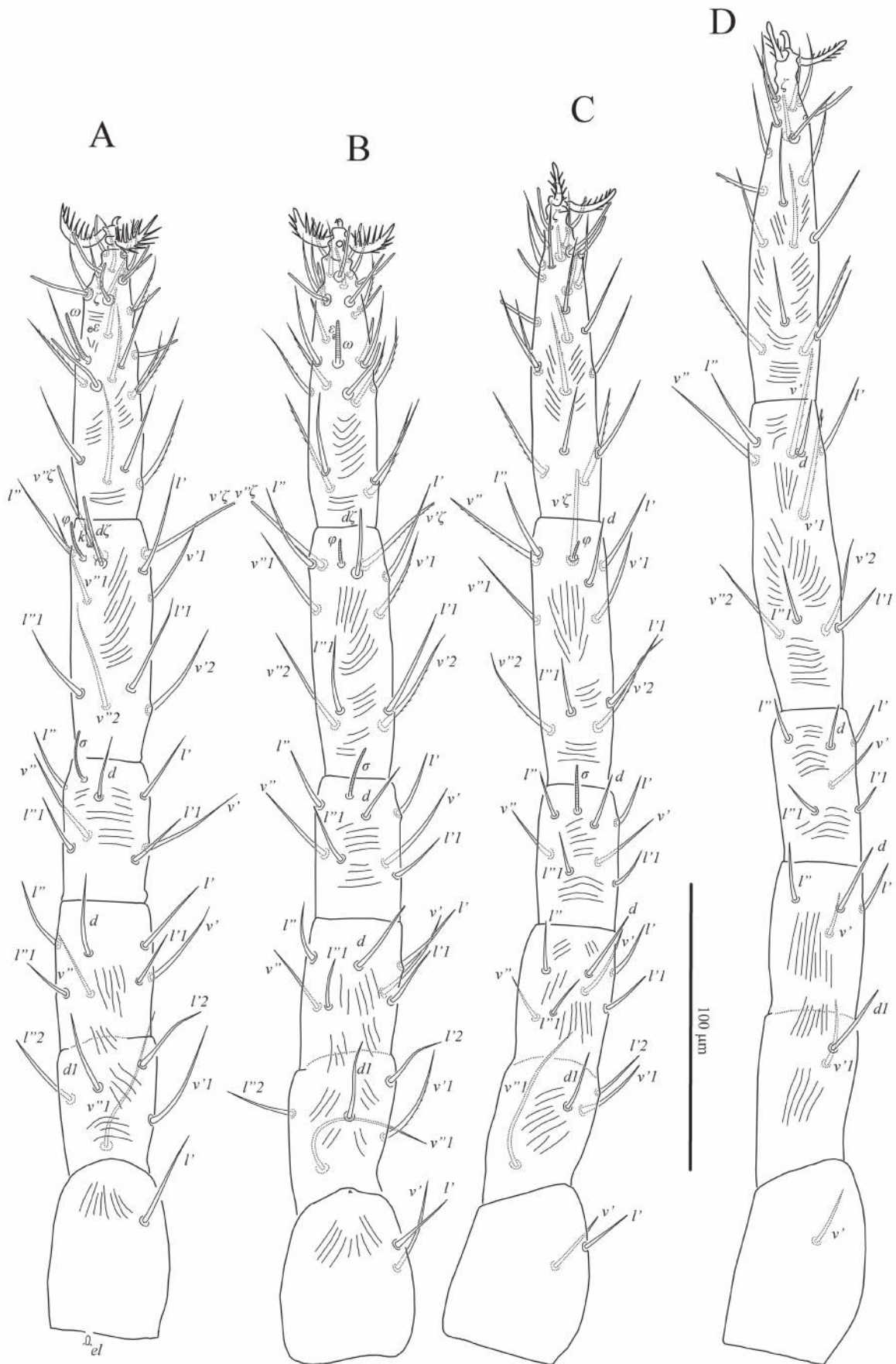


Fig. 4. *Adamystis burjaticus* sp.n., female: A–D—left legs I–IV, respectively, dorsal aspect.

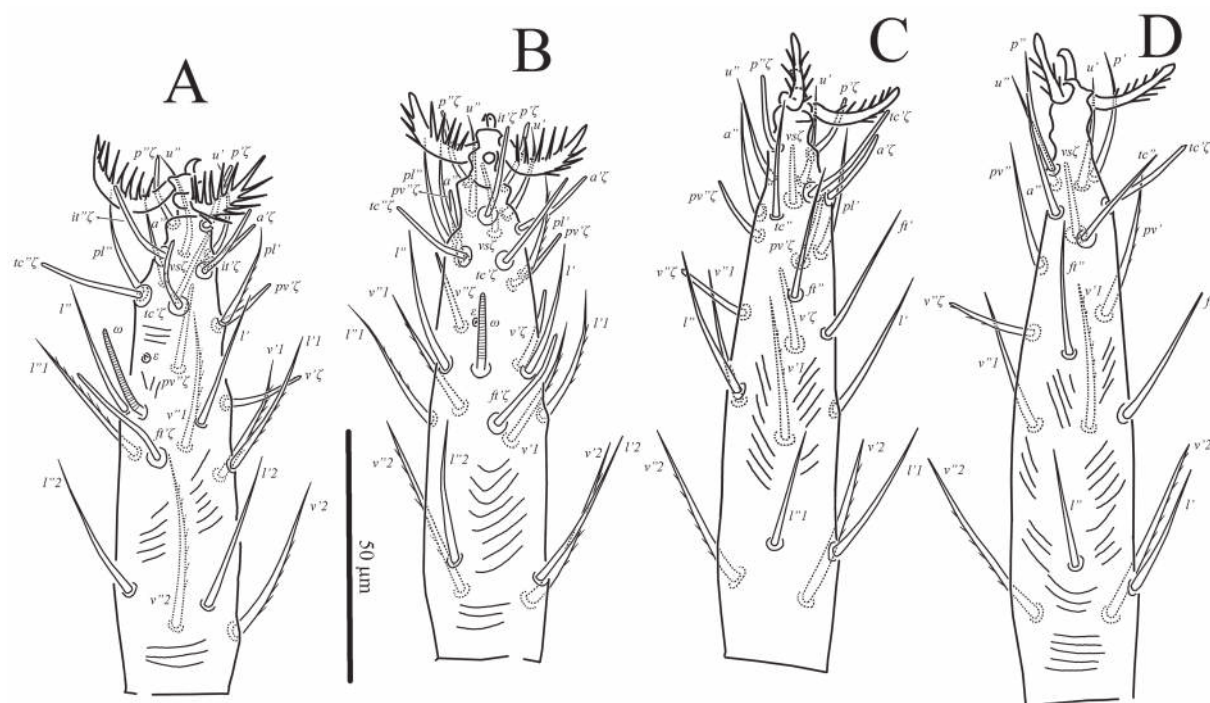


Fig. 5. *Adamystis burjaticus* sp. n., female: A–D—left tarsi I–IV, respectively, dorsal aspect.

of tiny eugenital setae (as in female), male genitalia with additional two pairs of thick and blunt tipped eugenital setae *eu3* and *eu4*, and with ovate area of sclerotized granulate-striate microsculpture (Fig. 2D).

Immatures unknown.

Type material. Female holotype, slide № ZISP T-Adam-1, Buryatia, Barguzinsky District, Svyatoy Nos Peninsula, soil on a meadow, 53°37'07.43"N 108°49'28.02"E, 1,330 m a.s.l., 20 August 2022, Coll. V.M. Salavatulin; paratypes: 1 female, 2 males, same locality, litter under *Vaccinium vitis-idaea*; 2 females, 3 males, same locality, litter under pine; 1 female, Buryatia, Barguzinsky District, 53°38'38.64"N 110°01'21.79"E, in litter under a birch, 495 m a.s.l., 20 August 2022, Coll. V.M. Salavatulin.

Type deposition. The holotype and one male paratype are deposited in the collection of the Zoological Institute of RAS, Saint Petersburg, Russia; other paratypes are deposited in the collection of the Tyumen State University Museum of Zoology, Tyumen, Russia.

Etymology. The name of the new species refers to its geographical distribution in Buryatia.

Differential diagnosis. The new species is most similar to *A. trimaculata* Ueckermann, 1989 in: having a reticulate dorsal shield and two setae

on chelicera; absence of lens-like structures; and location of setae *hl*–*2* on separate platelets. Female and male specimens of the new species differ from *A. trimaculata* in: the dorsal shield entirely reticulate (vs. with three longitudinally aligned round smooth spots in *A. trimaculata*); clearly reticulate ventral idiosomal plates (vs. not reticulate in *A. trimaculata*); nine setae on palptarsus (vs. six in *A. trimaculata*); setae *ag2* located on small platelets (vs. on big posterior projection of coxisternal plate I–IV in *A. trimaculata*); four pairs of setae on subcapitulum (vs. three in *A. trimaculata*); and 6–7 pairs of genital setae (vs. 17–18 in *A. trimaculata*).

***Adamystis saboorii* Paktinat-Saeij and Ahaniazad, 2019**

Adamystis saboorii Paktinat-Saeij *et al.*
2019: 133

This species was described from the East Azerbaijan Province in Iran (Paktinat-Saeij *et al.* 2019).

This article presents the first record of *A. saboorii* from Russia.

Material examined. 1 female, the Altai Republic, Kosh-Agach District, 50°01'07.5"N 88°36'05.7"E, 1,775 m a.s.l., in dry soil, 15 July 2021, coll. A.A. Khaustov.

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REFERENCES

- Barilo, A.B. 1987. On the mites of the family Adamystidae (Acariformes, Prostigmata) found in Middle Asia. *Zoologicheskii Zhurnal*, 66(9): 1414–1416. [In Russian]
- Beyzavi, G.R., Ueckermann, E.A. and Ostovan, H. 2012. A new *Adamystis* Cunliffe, 1957 species from Iran (Acari: Trombidiformes: Adamystidae). *Systematic and Applied Acarology*, 17(1): 27–30.
- Coineau, Y. 1974. Un nouveau type d'acariformes prostigmatés libres, les Saxidromoidea nouvelle superfamille. *Comptes Rendus des Séances de l'Académie des Sciences, Série D, Sciences Naturelles*, 278: 1059–1062.
- Cunliffe, F. 1957. Notes on the Anystidae with a description of a new genus and species, *Adamystis donnae*, and a new subfamily, Adamystinae (Acarina). *Proceeding of the Entomological Society of Washington*, 59(4): 172–175.
- Fuangularworn, M., Beyzavi, G.R. and Ostovan, H. 2012. *Adamystis* Cunliffe, 1957 (Acari: Prostigmata: Adamystidae) in Iran: two new species and a key to the Iranian species. *Systematic and Applied Acarology*, 17(4): 448–457.
- Fuangularworn, M. and Lekprayoon, C. 2010. *Adamystis thailandensis* sp.n. (Acari: Prostigmata: Adamystidae), a new species of soil mites from Thailand with a key to world species of Adamystidae. *Zootaxa*, 2649: 61–68.
- Ghasemi-Moghadam, S., Ahadiyat, A., Saboori, A. and Fathipour, Y. 2019. A new species of *Adamystis* (Acari: Trombidiformes: Adamystidae) from Iran. *Zootaxa*, 4647(1): 14–22.
- Hunter, P.E. and Crossley, D.A. 1968. *Adamystis sarae*, a new species of soil mite from cornfield litter in South Carolina (Acari: Anystidae). *Journal of the Georgia Entomological Society*, 3(4): 181–183.
- Kethley, J.B. 1990. Acarina: Prostigmata (Actinedida). In: D.L. Dindal (Ed.). *Soil Biology Guide*. Wiley, New York, pp. 667–756.
- Khanjani, M., Alvandy, S., Asali-Fayaz, B. and Ueckermann, E.A. 2012. A new species of the genus *Adamystis* (Acari: Anystina: Adamystidae) from western Iran. *Systematic and Applied Acarology*, 17(1): 31–35.
- McDaniel, B. and Bolen, E.G. 1983. A new species of *Adamystis* (Acari: Adamystidae) from the Southern high plain of Texas. *Proceedings of the Entomological Society of Washington*, 85(1): 177–179.
- Norton, R.A. 1977. A review of F. Grandjean's system of leg chaetotaxy in the Oribatei and its application to the Damaeidae. In: D.L. Dindal (Ed.). *Biology of Oribatid Mites*. SUNY College of Environmental Science and Forestry, Syracuse, pp. 33–62.
- Paktinat-Saeij, S., Ahaniazad, M., Bagheri, M. and Damavandian, M. 2019. A new species of the genus *Adamystis* Cunliffe (Acari: Trombidiformes: Adamystidae) from Iran, with a key to the world species. *Systematic and Applied Acarology*, 24(1): 132–138.
- Paktinat-Saeij, S. and Kazemi, S. 2021. A new species of *Adamystis* Cunliffe (Acari: Trombidiformes: Adamystidae) from mangrove in the Persian Gulf, Iran, with a key to world species of the genus. *Systematic and Applied Acarology*, 26(1): 260–271.
- Pogrebnyak, S. 2007. *Adamystis fonsi* (Prostigmata, Adamystidae) external morphology peculiarities—new for Ukraine family of prostigmatid mites. *Vestnik Zoologii*, 39: 13–20.
- Rafalski, J. 1982. *Adamystis coineaui* sp.n. (Acari, Adamystidae) from Hindu-Kush. *Acarologia*, 23(2): 135–143.
- Ueckermann, E.A. 1989. A revision of the family Adamystidae Cunliffe (Acari: Prostigmata). *Phytophylactica*, 21: 227–240.
- Walter, D.E., Lindquist, E.E., Smith, I.M., Cook, D.R. and Krantz, G.W. 2009. Order Trombidiformes. In: G.W. Krantz and D.E. Walter (Eds.). *A Manual of Acarology* (3rd Edition). Texas Tech University Press, Lubbock, USA, pp. 233–420.