

TWO NEW SPECIES OF *IPHIDOZERCON* (ACARI: ASCIDAE)
WITH A KEY TO FEMALES

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Two new species of *Iphidozercon* are described from litter in the Altai Mountains from Siberia and the Khabarovsk Region of the Far East of Russia – *I. altaicus* sp. n. and *I. colliculatus* sp. n. The genus now includes ten species from Europe, Asia, North America, Australia and New Caledonia. A key to females of all species is provided.

Key words: mites, Acari, *Iphidozercon*, Altai Mountains, Khabarovsk Region, Russia

INTRODUCTION

The genus *Iphidozercon* was described over 100 years ago by BERLESE (1903). Since then, the description of this genus has been systematically supplemented (EVANS 1958, LINDQUIST & EVANS 1965, KRANTZ & AINSCOUGH 1990, KARG 1993, HALLIDAY *et al.* 1998, GWIAZDOWICZ & HALLIDAY 2008). According to the aforementioned authors the typical features of *Iphidozercon* include the dorsal idiosoma with the holodorsal shield without lateral incisions; vertex strongly arched downwards, setae j1 (vertical) usually not visible from above; dorsal shield with 32 pairs of setae (18 podonotal and 14 opisthonotal); ornamentation punctulate, reticulate or areolate; gland pores and lyrifissures obscured by ornamentation, apparently minute; sternal shield of female with three pairs of setae and three pairs of pores; genital shield of female small and narrow, setae st5 situated outside this shield; sternal shield of male with five pairs of setae, a genital orifice in front of this shield; the ventrianal shield of male is relatively large with nine ventral setae and three circum-anal setae; peritrematal shield wide, with long peritreme; anterior ends of peritremes sharply recurved postero-ventrally; areolate metapodal plates present behind peritremal shield; anal shield with one pair of para-anal setae and unpaired post-anal seta; hypostome with seven rows of five to 21 denticles; fixed digit of chelicera tridentate or quadridentate and movable digit bidentate or tridentate; epistome tri-ramous, with denticles; palptarsus with one macroseta. Then KARG (1993) distinguished the genus *Iphidozercon* among others on the basis of the absence of a lateral boundary of a hypostomal groove on the hypostome, where seven denticulate rows are present. Legs I–IV with pre-tarsus and claws.

Leg chaetotaxy reduced: genu II with nine or ten setae; genu III with seven setae, pv1 absent; genu IV with seven setae, al2, pd3 absent; tibia III with seven setae, al2 absent; tibia IV with seven setae, al2, pl2, pd3 absent; tarsi II–IV with one (al1) or two (al1, pl1) dorso-lateral subapical setae very slender and elongate (LINDQUIST & EVANS 1965; GWIAZDOWICZ & HALLIDAY 2008).

The genus *Iphidozercon* currently includes eight species of small mites that occur in low numbers in soil, leaf litter, compost and under bark, in Europe, Asia, North America and Australia (CHANT 1963, ISHIKAWA 1969, KARG 1996, GWIAZDOWICZ 2003, 2007, GWIAZDOWICZ & HALLIDAY 2008). This study is devoted to the description of two new species of the genus found in the Altai Mountains in Siberia and the Khabarovsk Region of Far East Russia.

MATERIALS AND METHODS

Specimens of *Iphidozercon* were extracted from litter using a Tullgren funnel and mounted in Hoyer's medium. All figures were drawn using a ZEISS AXIOSKOP 2 microscope. Morphological details were measured as follows: setal length from base to tip, shield length along midline and width at the widest point of the shield. All measurements were taken in micrometers (μm). In the presented work the chaetotaxy, symbols and the numbering system of setae on dorsal and ventral side and limbs were used after LINDQUIST & EVANS (1965). Holotypes are deposited in the Siberian Zoological Museum in Novosibirsk, Russia, paratypes are deposited in University of Life Sciences in Poznan, Poland.

SYSTEMATICS

Iphidozercon BERLESE

Iphidozercon BERLESE, 1903: 246. Type species *Eviphis* (?) *gibbus* BERLESE, 1903, by monotypy.

***Iphidozercon altaicus* sp. n.**

(Figs 1–4)

Description. Female (N = 3). Dorsum (Fig. 1). Dorsal shield oval, length 375–380 μm , width 230–250 μm distinct foveate sculpture throughout. 18 pairs of setae on podonotal part of shield and 14 pairs of setae on opisthonotal part of shield. All setae fine, smooth and pointed, length of 25–30 μm , except j1 (10 μm , inserted ventrally), and two antero-lateral setae s1, s2 (15 μm).

Venter (Fig. 2) Tritosternum with trapezoidal base (25 μm) and finely pilose laciniae (35 μm). Sternal shield rectangular, 70 \times 55 μm , setae st1–st3 smooth and pointed, length 10 μm . Metasternal setae st4 (10 μm) on soft membrane. Genital shield small and narrow (55 μm), spatulate posteriorly. Genital setae st5 (15 μm) outside the shield. Anal shield relatively large 60 μm long, 70 μm wide with

para-anal setae (15 μm) and post-anal seta (20 μm). Narrow cribrum below post-anal seta. Sternal, genital and anal shields are unornamented. Peritremes ending anteriorly to coxae I, stigmata at level of coxae IV. Peritremal shields wide, with weak posterior lineate ornamentation. Opisthogastric integument behind coxae IV with one pair of oval metapodal plates, a pair of smaller plates near posterior ends of peritrematal shields. Opisthogastric setae JV1–JV5, ZV1–ZV2 15 μm long, others (R2–R4) approximately 20 μm .

Gnathosoma. Hypostome with robust horn-like corniculi and four pairs of setae. Anterior seta h1 longest (30 μm), internal seta h3 (20 μm), palp coxal seta h4 (25 μm) shorter, external seta h2 (10 μm) shortest. Seven transverse rows of hypostomal denticles present, numbers of denticles per row (anterior to posterior) 12, 15, 17, 15, 17, 16, 13 (Fig. 3a). Chelicera typical of genus, fixed digit with three teeth, movable digit with two teeth (Fig. 3b), other details of chelicerae not visible in available specimens. Epistome with central prong longest, lateral prongs shorter, with denticulate outer margins (Fig. 3c).

Legs and palps. Lengths of legs: I – 230 μm , II – 200 μm , III – 180 μm , IV – 210 μm . Setation of genua I–II–III–IV: 12–10–7–7 (Fig. 4a); tibiae 12–9–7–7 (Fig. 4b). Tarsus II to IV each with the dorsoproximal setae ad2 and pd2 short and straight (Fig. 4c). Palp apotele 2-tined.

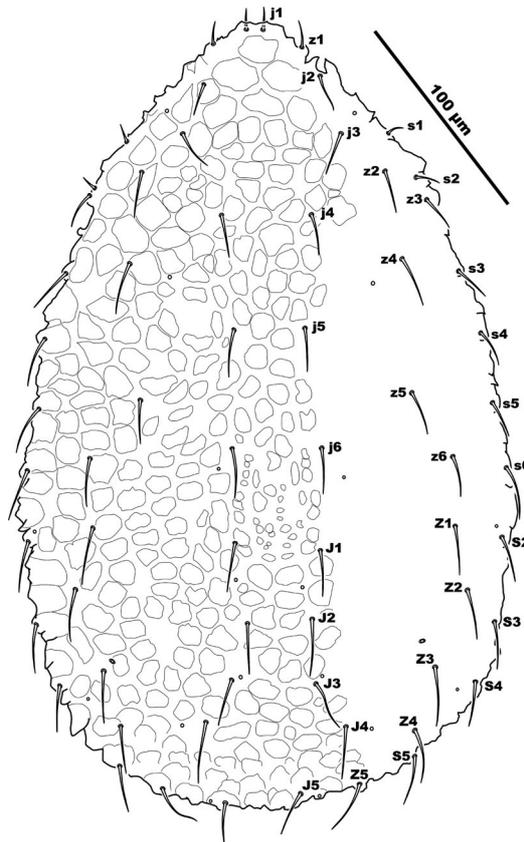


Fig. 1. *Iphidozercon altaicus* sp. n. – dorsal view

Material examined: Holotype: Female. Russia, North-East of Altai Mountains, Teletskoe lake region, environs of Obogo village, in litter of *Betula pubescens* – *Populus tremula* forest, (51°30'48'' N, 87°18'7'' E, 900 m a.s.l.), 6 August 2007, leg. I. I. MARCHENKO. Paratypes: 2 females, North-East of Altai Mountains, Teletskoe lake region, environs of Obogo village, in litter of *Abies sibirica* – *Pinus sibirica* forest, (51°30'48'' N, 87°18'7'' E, 900 m a.s.l.), 6 August 2007, leg. I. I. MARCHENKO.

Etymology. The name of this species reflects the fact that it was collected in the Altai Mountains.

Differential diagnosis. *Iphidozercon altaicus* sp. n. is similar to *Iphidozercon foveatus* GWIAZDOWICZ et HALLIDAY, 2008. Both species have foveate sculpture on the dorsal shield and similar lengths of dorsal setae. The length of peritreme and the shape of genital shield is similar in both species. Nevertheless, many differences have been detected, such as shapes of the peritremal and anal shields. In *I. foveatus* the anal shield is narrow, while in *I. altaicus* it is wider than long. In *I.*

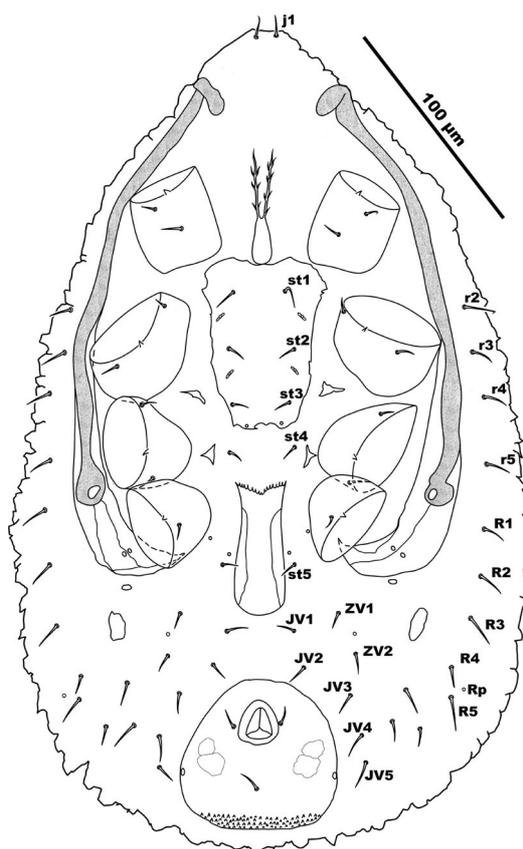


Fig. 2. *Iphidozercon altaicus* sp. n. – ventral view

foveatus the peritremal shield is wide, with tiny denticles on the internal side and in *I. altaicus* the shield is narrower and without denticles. In *I. foveatus* five pairs of smaller platelets bearing pores are located on the ventral side, in *I. altaicus* there are no such platelets. In *I. foveatus* the epistome has a central elongated prong ending in three denticles, but in *I. altaicus* the prong ends in spikes. In *I. foveatus* the movable digit has three teeth, but in *I. altaicus* it has two teeth.

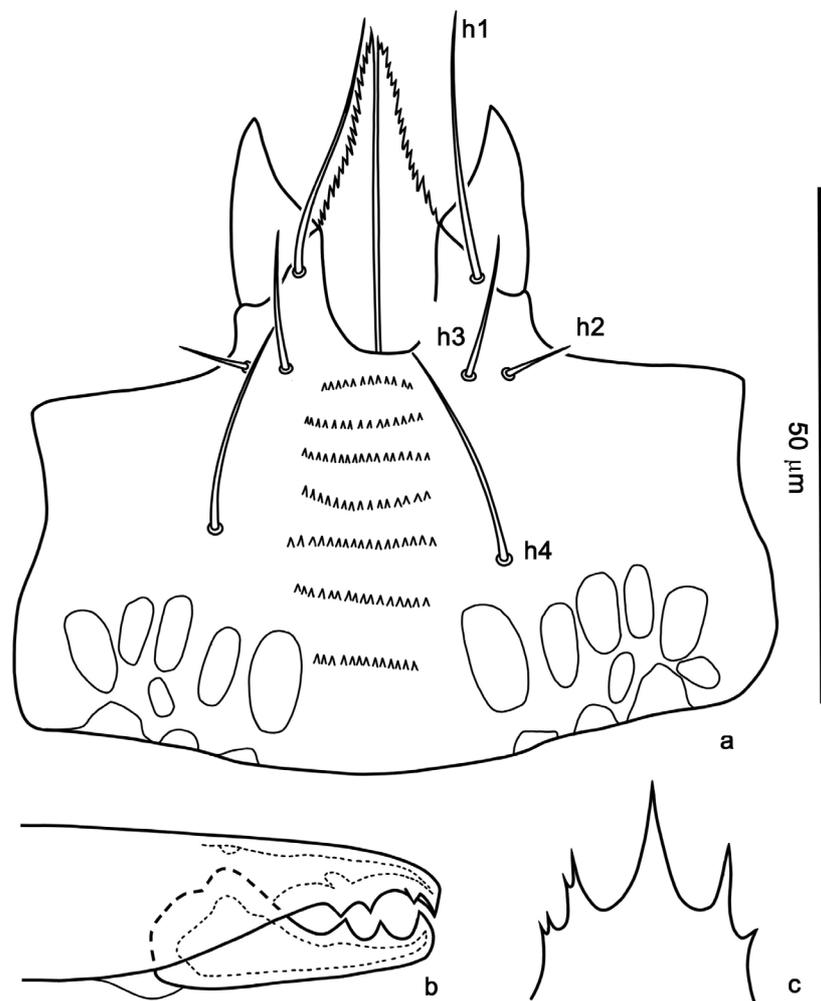


Fig. 3. *Iphidozercon altaicus* sp. n. – hypostome (a), chelicera (b), epistome (c)

***Iphidozercon colliculatus* sp. n.**
(Figs 5–8)

Description. Female (N=10). Dorsum (Fig. 5). Dorsal shield oval, length 310–330 μm , width 210–230 μm distinct foveate sculpture throughout. 18 pairs of setae on podonotal part of shield and 14 pairs of setae on opisthonotal part of shield. All setae fine, smooth and pointed, length of 15–20 μm , except j1 (10 μm , inserted ventrally), and two antero-lateral setae s1, s2 (ca 10 μm).

Venter (Fig. 6.) Tritosternum with trapezoidal base (30 μm) and finely pilose laciniae (45 μm). Sternal shield rectangular, 55–60 \times 35–40 μm , setae st1–st3 smooth and pointed, length 10 μm . Metasternal setae st4 (10 μm) on soft membrane. Genital shield small and narrow (55–60 μm), spatulate posteriorly. Genital setae st5 (15 μm) outside the shield. Anal shield relatively large 55 μm long, 45 μm wide with para-anal setae (12–13 μm) and post-anal seta (15 μm). Narrow cribrum below post-anal seta. Sternal, genital and anal shields are unornamented. Stigmata located at level of coxae

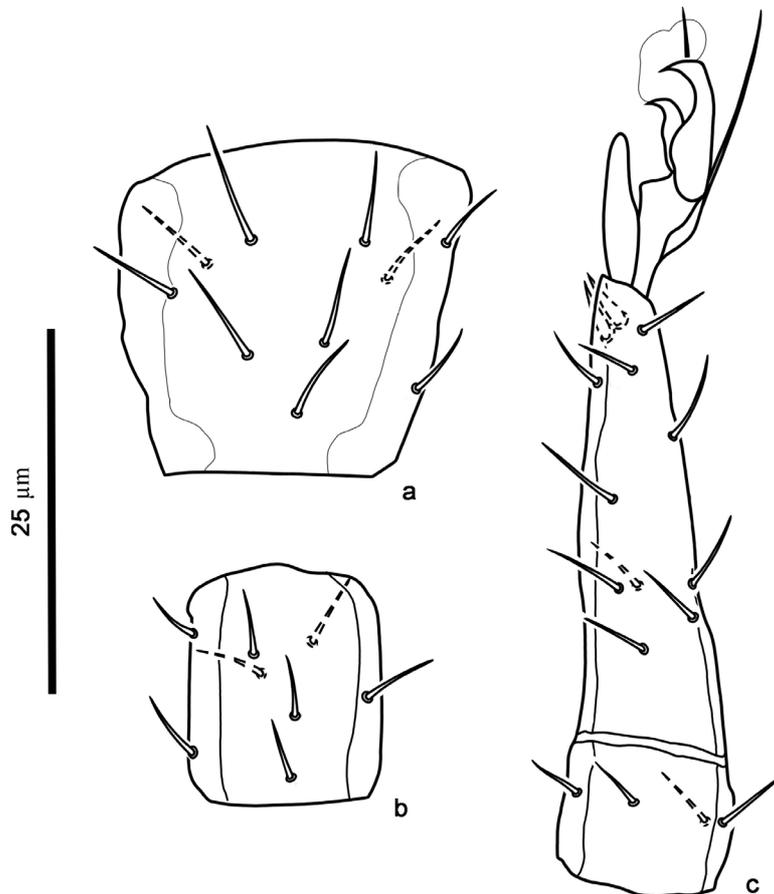


Fig. 4. *Iphidozercon altaicus* sp. n. – genu II (a), tibia II (b), tarsus II (c)

IV, peritremes extending anterior to coxae I, projecting for a short distance behind stigmata. Peritremal shields wide. Opisthogastric integument behind coxae IV with two pairs of oval metapodal plates ($15 \times 10 \mu\text{m}$; $10 \times 7\text{--}8 \mu\text{m}$) and several pairs of very small ($5\text{--}6 \times 2\text{--}4 \mu\text{m}$) platelets. Opisthogastric setae JV1–JV5, ZV1–ZV2 $10\text{--}15 \mu\text{m}$ long.

Gnathosoma. Hypostome with robust horn-like corniculi and four pairs of setae. Anterior seta h1 longest ($30 \mu\text{m}$), internal seta h3 ($20 \mu\text{m}$), palp coxal seta ($25 \mu\text{m}$) shorter, external seta h2 ($10 \mu\text{m}$) shortest. Seven transverse rows of hypostomal denticles present, numbers of denticles per row (anterior to posterior) 10, 14, 12, 12, 17, 12, 9 (Fig. 7a). Chelicera typical of genus, fixed digit with four teeth, movable digit with two teeth (Fig. 7b), other details of chelicerae not visible in available specimens. Epistome with central prong longest, its distal end club-like and denticulate, lateral prongs shorter, with denticulate outer margins (Fig. 7c).

Legs and palps. Lengths of legs: I – $220\text{--}230 \mu\text{m}$, II – $190\text{--}200 \mu\text{m}$, III – $170\text{--}180 \mu\text{m}$, IV – $200\text{--}210 \mu\text{m}$. Setation of genua I–II–III–IV: $12\text{--}9\text{--}7\text{--}7$ (Fig. 8b) av1 absent from genu II; tibiae $12\text{--}9\text{--}7\text{--}7$ (Fig. 8c). Tarsus II to IV each with the dorsoproximal setae ad2 and pd2 short and straight (Fig. 8d). Palp apotele 2-tined (Fig. 8a).

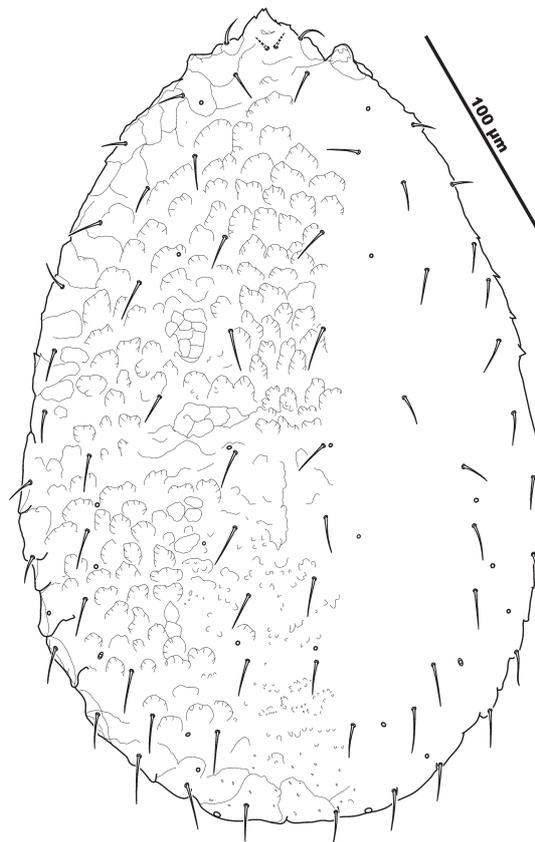


Fig.5. *Iphidozercon colliculatus* sp. n. – dorsal view

Etymology. The name of this species reflects the colliculate ornamentation of the dorsal shield.

Material examined: Holotype: Female. Russia, Khabarovsk Region, environs of Boytsovo vilage, in litter of *Pinus koraiensis* – broad-leaved forest (46°58'48'' N, 134°19'57'' E, 500 m a.s.l), 15 August 1991, leg. I. I. VOLONIKHINA. Paratypes: 9 females, same data as holotype.

Differential diagnosis. *Iphidozercon colliculatus* sp. n. is similar to *I. australis* GWIAZDOWICZ et HALLIDAY, 2008. Both species have colliculate sculpture on the dorsal shields. In both species the length of the peritreme (including the short section extending beyond the stigma) is similar, as is the shape of the sternal and genital shields. Additionally, 9 setae (av1 absent) are located on genu II in both species. Nevertheless, many differences exist between both species. In *I. australis* dorsal setae J1–J3 are long and reach the bases of the following setae, while in *I. colliculatus* these setae are short and do not reach the bases of the following setae.

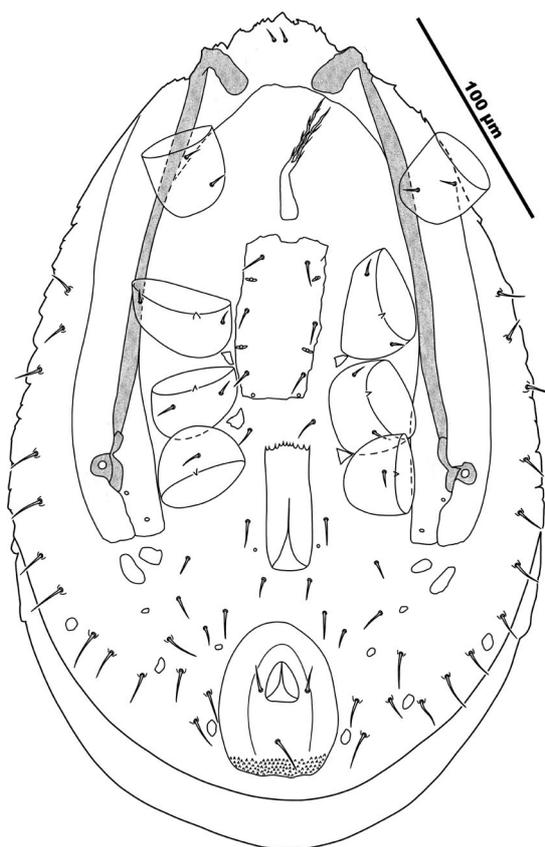


Fig.6. *Iphidozercon colliculatus* sp. n. – ventral view

In *I. colliculatus* the peritremal shield is wide and in *I. australis* the shield is narrower. In *I. australis* the epistome has a central elongated prong ending in three denticles, while in *I. colliculatus* it has many tiny denticles. In *I. australis* the movable digit has three, while in *I. colliculatus* it has two teeth.

KEY TO FEMALES OF THE GENUS *IPHIDOZERCON*

Information on *I. californicus* and *I. validus* was obtained from published descriptions and illustrations, and for the other species, by examination of types.

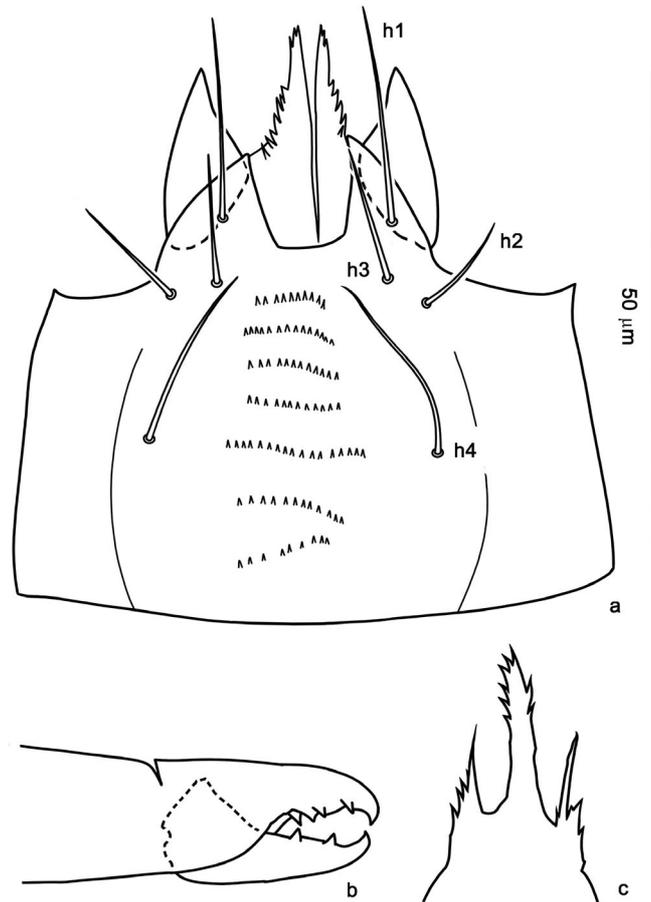


Fig. 7. *Iphidozercon colliculatus* sp. n. – hypostome (a), chelicera (b), epistome (c)

- | | | |
|----|---|---|
| 1. | Posterior end of peritreme extending beyond stigma (Fig. 6). | 2 |
| – | Posterior end of peritreme not extending beyond stigma (Fig. 2). | 7 |
| 2. | Genu II with 9 setae (av1 absent) (Fig. 8b). | 3 |
| – | Genu II with 10 setae (av1 present) (Fig. 4a). | 4 |
| 3. | Setae J1–J3 long, reaching bases of following setae; movable digit with three teeth. | <i>I. australis</i> GWIAZDOWICZ et HALLIDAY, 2008 |
| – | Setae J1–J3 short, not reaching bases of following setae; movable digit with two teeth. | <i>I. colliculatus</i> sp. n. |
| 4. | Posterior dorsal shield setae uniform in length | 5 |
| – | Dorsal shield setae Z4, Z5, more than double length of J1–J5. | <i>I. californicus</i> CHANT, 1963 |
| 5. | Dorsal shield with areolate, colliculate or punctate sculpture. | 6 |

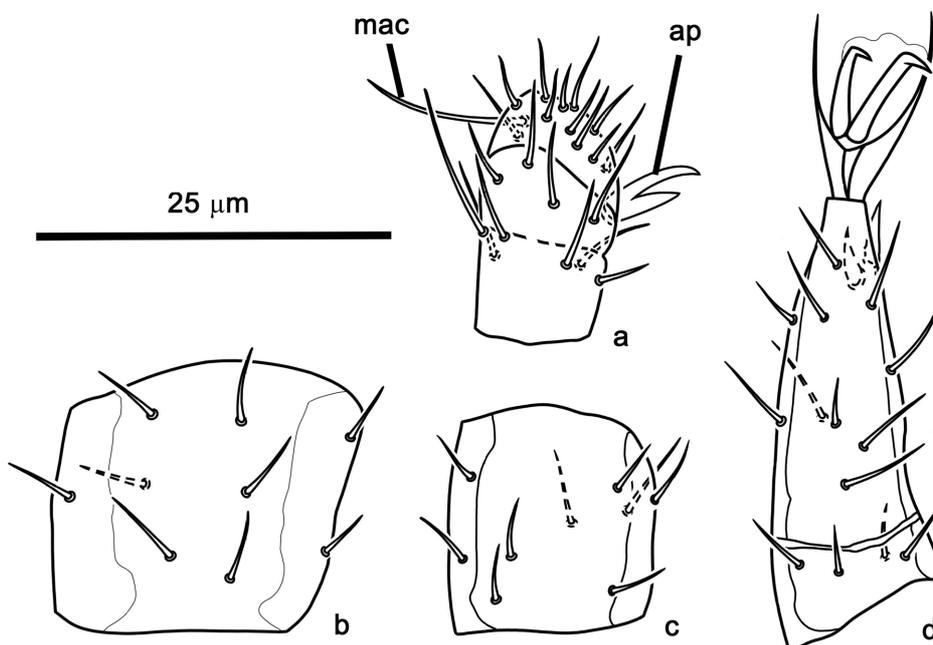


Fig. 8. *Iphidozercon colliculatus* sp. n. – palp tarsus, mac – macroseta, ap – apotele (a), genu II (b), tibia II (c), tarsus II (d)

- Dorsal shield with foveate sculpture. *I. validus* KARG, 1996
6. Anal shield longer than wide, sculpture on dorsal shield colliculate.
I. corticalis EVANS, 1958
- Anal shield wider than long, sculpture on dorsal shield punctate and areolate. *I. poststigmatus* GWIAZDOWICZ, 2003
7. Dorsal shield with foveate sculpture. 8
- Dorsal shield with another type of sculpture. 9
8. Anal shield longer than wide, peritrematal shield wide, ornamented with small denticles on medial side.
I. foveatus GWIAZDOWICZ et HALLIDAY, 2008
- Anal shield wider than long, peritrematal shield without small denticles on medial side. ***I. altaicus*** sp. n.
9. Setae J1–J3 short, not reaching bases of following setae; opisthonotal part of dorsal shield with areolate sculpture.
Iphidozercon gibbus (BERLESE, 1903)
- Setae J1–J3 long, almost reaching bases of following setae; opisthonotal part of dorsal shield with granulate-tuberculate sculpture.
I. walteri GWIAZDOWICZ et HALLIDAY, 2008

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REFERENCES

- BERLESE, A. (1903) Acari nuovi I. *Redia* **1**: 235–252.
- CHANT, D. A. (1963) The subfamily Blattisocinae Garman (= Aceosejinae EVANS) (Acarina: Blattisocidae Garman) (= Aceosejidae Baker and Wharton) in North America, with descriptions of new species. *Canadian Journal of Zoology* **41**: 243–305.
- EVANS, G. O. (1958) A revision of the British Aceosejinae (Acarina: Mesostigmata). *Proceedings of the Royal Zoological Society, London* **131**(2): 177–229.
- GWIAZDOWICZ, D. J. (2003) Description of *Iphidozercon poststigmatus* sp. n. (Acari, Ascidae) with a key to Palearctic species of the genus *Iphidozercon*. *Biologia, Bratislava* **58**(2): 151–154.
- GWIAZDOWICZ, D. J. (2007) *Ascid mites (Acari, Mesostigmata) from selected forest ecosystems and microhabitats in Poland*. Wyd. Akademia Rolnicza, Poznań, 248 pp.

- GWIAZDOWICZ, D. J. & HALLIDAY, R. B. (2008) The Australian species of Iphidozercon (Acari: Ascidae). *Zootaxa* **1921**: 47–68.
- HALLIDAY, R. B., WALTER, D. E. & LINDQUIST, E. E. (1998) Revision of the Australian Ascidae (Acarina: Mesostigmata). *Invertebrate Taxonomy* **12**: 1–54.
- ISHIKAWA, K. (1969) Studies on the mesostigmatid mites in Japan. IV. Family Blattisocidae Garmann. *Reports of Research, Matsuyama Shinonome Junior College* **4**(1): 111–139.
- KARG, W. (1993) *Acari (Acarina), Milben Parasitiformes (Anactinochaeta), Cohors Gamasina Leach. Raubmilben*. Die Tierwelt Deutschlands, 59 Teil. Gustav Fischer Verlag, Jena, 523 pp.
- KARG, W. (1996) Neue Arten aus Raubmilbengattungen der Gamasina Leach (Acarina, Parasitiformes) mit Indikationen zum Entwicklungsalter. *Mitteilungen aus dem Museum für Naturkunde in Berlin. Zoologisches Museum und Institut für Spezielle Zoologie (Berlin)* **72**: 149–195.
- KRANTZ, G. & AINSCOUGH, B. D. (1990) Acarina: Mesostigmata (Gamasida). Pp. 583–666. In: DINDAL, D. L. (ed.): *Soil biology guide*. John Wiley & Sons, New York.
- LINDQUIST, E. E. & EVANS, G. O. (1965) Taxonomic concepts in the Ascidae, with a modified setal nomenclature for the idiosoma of the Gamasina (Acarina: Mesostigmata). *Memoirs of the Entomological Society of Canada* **47**: 1–64.

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