

Contribution to the knowledge of the oribatid mite genus *Leobodes* (Acari, Oribatida, Nippobodidae)

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Original research

ABSTRACT

Three new species of oribatid mites of the genus *Leobodes* (Oribatida, Nippobodidae) - *L. becki* n. sp., *L. schalleri* n. sp. and *L. schawalleri* n. sp. - are described from Nepal. Revised generic diagnosis and an identification key to 10 known species of *Leobodes* are provided.

Keywords Nepalese fauna; taxonomy; new species; morphology; generic diagnosis; identification key

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Introduction

The oribatid mite genus *Leobodes* (Acari, Oribatida, Nippobodidae) was described by Aoki (1965a), with *Leobodes mirabilis* Aoki, 1965 as type species. At present, *Leobodes* comprises seven species, which are all distributed in the Oriental region (Subías 2004, online version 2021).

During taxonomic identification of oribatid mites which were collected from the Jochen Martens Expeditions to Nepal in 1988 (Results of the Himalaya Expeditions of J. Martens from 1969–2004, No. 290) and housed in the Institut für Organismische und Molekulare Evolutionsbiologie (Mainz, Germany), we found three new species, belonging to *Leobodes*. The main goal of our paper is to describe and illustrate these new species. In addition, the revised generic diagnosis and an identification key to known species of the genus are presented.

Until now, three *Leobodes* species have been registered from Nepal (e.g. Ermilov and Martens 2014a, b): *L. anulatus* Aoki, 1965; *L. lijiangensis* Aoki, 2000; and *L. mirabilis* Aoki, 1965.

Material and methods

Specimens — Samples containing oribatid mites were collected by the following method: leaf litter and upper layer of soil were collected by hand, sieved by means of a “Käfersieb”, larger arthropods were sorted out by hand on a large white plastic sheet and the remainder of sieved substrate filled into a number of small, easily transportable Berlese funnels, each containing a vial filled about half with 75% alcohol; all samples were extracted in open field conditions during three days/nights; no special warming was applied except for sunshine radiation. To protect the funnels over night against rain, they were placed in a tent. Final sorting of the samples as to different arthropod groups was done in the Mainz lab of the Martens group. See the *Material examined* section for detailed location data for each new species. Specimens

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(preserved in 70% solution of ethanol with a drop of glycerol) are deposited in two institutions: the Senckenberg Museum of Natural History, Görlitz, Germany (SMNH); and the Tyumen State University Museum of Zoology, Tyumen, Russia (TSUMZ).

Observation and documentation — Specimens were mounted in lactic acid on temporary cavity slides for measurement and illustration. Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the notogaster. Notogastral width refers to the maximum width of the notogaster in dorsal view. Lengths of body setae were measured in lateral aspect. All body measurements are presented in micrometers. Formulas for leg setation are given in parentheses according to the sequence trochanter-femur-genu-tibia-tarsus (famulus included). Formulas for leg solenidia are given in square brackets according to the sequence genu-tibia-tarsus. Drawings were made with a camera lucida using a Leica transmission light microscope “Leica DM 2500”. Images were obtained with an AxioCam ICc3 camera using a Carl Zeiss transmission light microscope “Axio Lab.A1”. SEM micrographs were made with the aid of a JEOL-JSM-6510LV SEM microscope.

Terminology — Morphological terminology partially used in this paper follows that of Grandjean: see Trávě and Vachon (1975) for references, Norton (1977) for leg setal nomenclature, and Norton and Behan-Pelletier (2009) for overview.

Abbreviations — Prodorsum: *ppr* = prodorsal process; *ph* = prodorsal (mediobasal) hollow; *pra* = prodorsal aperture; *lam* = lamella; *plam* = prolamella; *lpc* = lateral prodorsal carina; *tu* = tutorium; *cpm* = prodorsal medial condyle; *ro*, *le*, *in*, *bs* = rostral, lamellar, interlamellar, and bothridial seta, respectively. Notogaster: *cnm* = notogastral medial condyle; *cnl* = notogastral lateral condyle; *nt* = unpair notogastral tubercle in anterior part of notogaster; *c*, *da*, *dm*, *dp*, *la*, *lm*, *lp*, *h*, *p* = setae; *ia*, *im*, *ip*, *ih*, *ips* = lyrifissures; *gla* = opisthonotal gland opening. Gnathosoma: *a*, *m*, *h* = subcapitular setae; *d*, *l*, *sup*, *inf*, *cm*, *ul*, *su*, *vt*, *lt* = palp setae; ω = palp solenidium; *cha*, *chb* = cheliceral setae; *Tg* = Trägårdh's organ. Epimeral and lateral podosomal regions: *1a-c*, *2a*, *3a-c*, *4a*, *4c* = epimeral setae; *ep* = epimeral pit; *et* = epimeral tubercle; *PdI*, *PdII* = pedotectum I, II, respectively; *dis* = discidium; *vlr* = ventrolateral ridge. Anogenital region: *g*, *ag*, *an*, *ad* = genital, aggenital, anal, and adanal seta, respectively; *iad* = adanal lyrifissure; *po* = preanal organ. Legs: *Tr*, *Fe*, *Ge*, *Ti*, *Ta* = leg trochanter, femur, genu, tibia, and tarsus, respectively; *pa* = porose area; ω , ϕ , σ = leg solenidia; ϵ = leg famulus; *d*, *l*, *v*, *bv*, *ev*, *ft*, *tc*, *it*, *p*, *u*, *a*, *s*, *p*_v = leg setae.

Taxonomy

Family Nippobodidae

Genus *Leobodes* Aoki, 1965

Type species: *Leobodes mirabilis* Aoki, 1965

Diagnosis — Adult. With character states of the Nippobodidae (Chen and Wang 2007, partially; Norton and Behan-Pelletier 2007). Size: length of body about 500–850.

Integument – Surface smooth or with granulate microsculpturing, sometimes notogaster and anogenital region foveolate or rugose.

Prodorsum – Rostrum broadly rounded. Lateral carina well-developed. Lamella ridge-like. Prolamella and translamella absent or present, inconspicuous. Tutorium elongate plate-like, with triangular tip. Prodorsal hollow of prodorsum large, partially covered by prodorsal processes connected medially. Anterior parts of prodorsal processes often forming aperture which is fused with prodorsal hollow. Posterior parts of prodorsal processes with one pair of condyles. Rostral, lamellar and interlamellar setae comparatively long, setiform or thickened. Bothridial seta long, lanceolate. Bothridium cup-like. Exobothridial seta absent.

Notogaster – Anterior part of notogaster with two pairs of connected condyles (medial pair large, lateral pair small). Anterior margin inconspicuous, fused with prodorsal hollow, sometimes depressed or with unpair median tubercle. Ten or 13 (if *da*, *dm*, *dp* developed) pairs

of setiform, thickened or phylliform notogastral setae present; seta *c* inserted on ventrobasal part of medial condyle.

Gnathosoma – Subcapitulum diarthric. Adoral seta and axillary saccule absent. Typical palp setation: 0-2-1-3-7(+ ω). Solenidion bacilliform, pressed to the surface of tarsus.

Lateral podosomal and epimeral regions – Pedotectum I as a large lamina. Discidium present. Typical epimeral setal formula: 3-1-3-2.

Anogenital region – Four pairs of genital, one pair of aggenital, two pairs of anal, and three pairs of adanal setae. Adanal lyrifissure located close and lateral to anal aperture.

Legs – All legs monodactylous. Porose area present on all femora. Juvenile instars. Unknown.

***Leobodes becki* n. sp.**

Zoobank: 60B6A947-D356-424F-8C47-F7F7A0A8D718

(Figures 1a-c, 2a, 2c, 2d, 3a-d, 4a-d, 5a-d, 6a, 6b)

Diagnosis — Adult. Body size: 531–630 × 332–431. Body surface with dense granulate microsculpturing; foveolate ornamentation absent. Prodorsal processes connected medially at a relatively large distance; their anterior parts forming an oval, transversely oriented aperture located anterior to connecting region. Rostral, lamellar and interlamellar setae slightly thickened; *in* shortest, directed posterolaterad. Bothridial seta with distinctly lanceolate head having short attenuate tip. Anteromedian part of notogaster depressed. Notogastral tubercle absent. Distance between medial notogastral condyles comparatively long. Ten pairs of notogastral setae present: seta *c* long, with slightly phylliform basal part and bent posteriad attenuate mediodistal part; other setae short, thickened. Subcapitular seta *h* setiform. Seta *l'* on trochanter III of medium length, setiform; *v'* on leg trochanters III, IV comparatively short, setiform.

Description of adult — Measurements – Body length: 630 (holotype: female), 531–630 (16 paratypes: six males and 10 females); body width: 415 (holotype), 332–431 (16 paratypes).

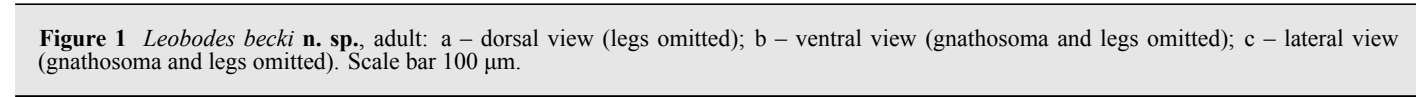
Integument – Body color brown. Body surface with dense granulate microsculpturing. Prodorsal processes close to prodorsal aperture sparsely tuberculate (diameter of tubercle up to 10). Region between bothridium and acetabula I–III densely tuberculate (diameter of tubercle up to 4). Region between bothridium and pedotecta I with some longitudinal folds.

Prodorsum – Rostrum rounded. Lateral carinae fused medially before rostral margin. Lamella slightly developed. Prolamella present, but inconspicuous. Tutorium and prodorsal hollow of prodorsum well developed. Prodorsal processes connected medially at a relatively large distance. Anterior parts of prodorsal processes forming oval, transversely oriented prodorsal aperture located anteriorly to connecting region. Rostral (86–90), lamellar (90–94) and interlamellar (57–61) setae slightly thickened, barbed; *ro* with slightly attenuate tip; *le* inserted on distinct tubercle; *in* directed posterolaterad (in dorsal view). Distance *in*–*le* distinctly longer than *le*–*ro*. Bothridial seta (98–106) with long stalk and short, distinctly lanceolate head having short attenuate tip, roughened.

Notogaster – Anteromedian part of notogaster depressed, fused with prodorsal hollow. Notogastral tubercle absent. Distance between medial notogastral condyles comparatively long (about as long as length between setae *lm*–*lm*). Ten pairs of notogastral setae present: seta *c* (123–131) with slightly phylliform basal part and bent posteriad attenuate mediodistal part, barbed; other setae (32–41) thickened, barbed. Opisthonotal gland opening and all lyrifissures distinct.

Gnathosoma – Subcapitulum size: 135–139 × 114–123. Subcapitular setae (*a*: 12–14; *m*: 45–49; *h*: 36–41) with attenuate tip, slightly barbed; *a* thinnest. Palp length: 77–82. Postpalpal seta (8) spiniform, roughened. Chelicera length: 155–164. Cheliceral setae (*cha*: 49–53; *chb*: 20–24) setiform, barbed; *cha* thicker than *chb*.

Epimeral and lateral podosomal regions – Epimeral setae (*1b*, *3c*: 32–41; others: 28–36) thin, with attenuate tip, slightly barbed. Ventrolateral tubercle on epimere II distinct. Discidium slightly developed.



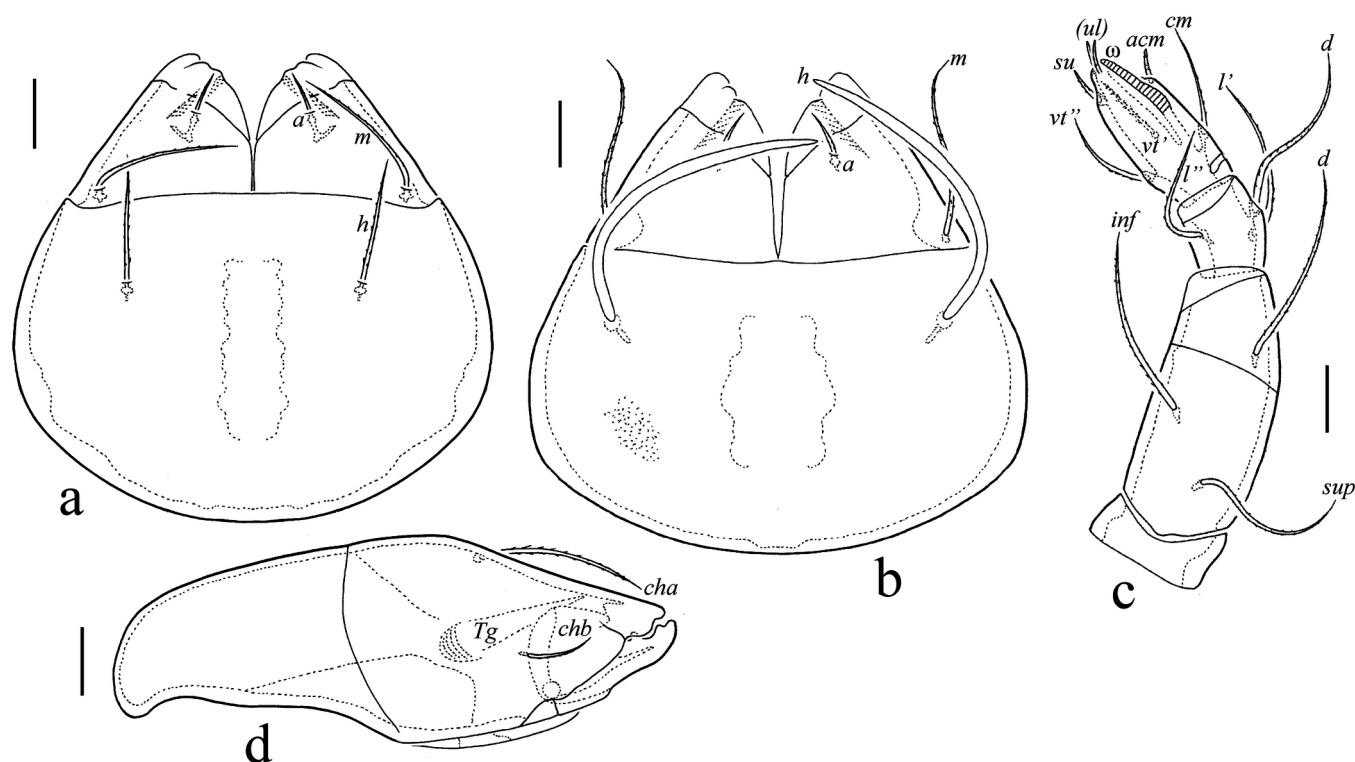


Figure 2 Gnathosoma of *Leobodes* spp., dissected adults: a – subcapitulum of *L. becki* n. sp., ventral view; b – subcapitulum of *L. schalleri* n. sp., ventral view; c – palp of *L. becki* n. sp., left, paraxial view; d – chelicera of *L. becki* n. sp., right, antiaxial view. Scale bars 20 μ m (a, b, d), 10 μ m (c).

Anogenital region – Genital seta (24–28) thin, with attenuate tip, slightly barbed. Aggenital, anal and adanal setae (28–36) thickened, barbed. Adanal lyrifissure distinct.

Legs – Claw of all legs strong, inconspicuously roughened on dorsal side. Dorsoparaxial porose area on femora I–IV distinct; porose area on trochanters III, IV not observed. Formulas of leg setation and solenidia: I (1–4–2–4–16) [1–2–2], II (1–4–2–2–15) [1–1–2], III (2–3–0–2–15) [1–1–0], IV (1–2–1–2–12) [0–1–0]; homology of setae and solenidia indicated in Table 1. Famulus on tarsus I short, erect, slightly swollen distally, inserted posterior to solenidium ω_1 . Seta *s* on tarsus I eupathidial, located before setae *a'* and *a''*. Setae *u'*, *u''* on tarsi I and *u''* on tarsus II spiniform; *u'* on tarsus II and *u'*, *u''* on tarsi III, IV spiniform. Seta *l'* on trochanter III of medium length, setiform; *v'* on trochanters III, IV comparatively short, setiform.

Material examined — Nepal, Sankhua Sabha District, Arun Valley, Chichila, 27°27,02'N, 87°13,13'E, 1900–2000 m a.s.l., leaf litter and upper layer of soil under bushes in degraded *Quercus* forest near village (sample No. 414), 18–20.VI.1988 (collected by J. Martens and W. Schawaller).

Type deposition — The holotype and one paratype are deposited in the collection of the SMNH; 15 paratypes are deposited in the collection of the TSUMZ.

Etymology — The specific name is dedicated to Prof. Dr. Ludwig Beck (State Museum of Natural History, Karlsruhe, Germany), the well-known acarologist.

Remarks — In main morphological traits (prodorsal processes have prodorsal aperture; notogastral seta *c* setiform, with mediobasal part bent and directed posteriad, other notogastral setae thickened; distance between medial prodorsal condyles equal to *lm*–*lm*) *Leobodes becki* n. sp. is morphologically most similar to *Leobodes praeconcaus* Chen and Wang, 2007 and *L. yinae* Aoki, 2000. However, the new species differs from both by the presence of interlamellar



Figure 3 Legs of *Leobodes* spp., dissected adults: a – leg I of *L. becki* n. sp., right, antiaxial view; b – leg II of *L. becki* n. sp., left, antiaxial view; c – leg III of *L. becki* n. sp., right, paraxial view; d – leg IV of *L. becki* n. sp., left, antiaxial view; e – leg trochanter III of *L. schalleri* n. sp., left, antiaxial view; f – leg trochanter IV of *L. schalleri* n. sp., left, antiaxial view; g – leg trochanter III of *L. schawalleri* n. sp., left, antiaxial view; h – leg trochanter IV of *L. schawalleri* n. sp., left, antiaxial view. Scale bar 50 μ m.

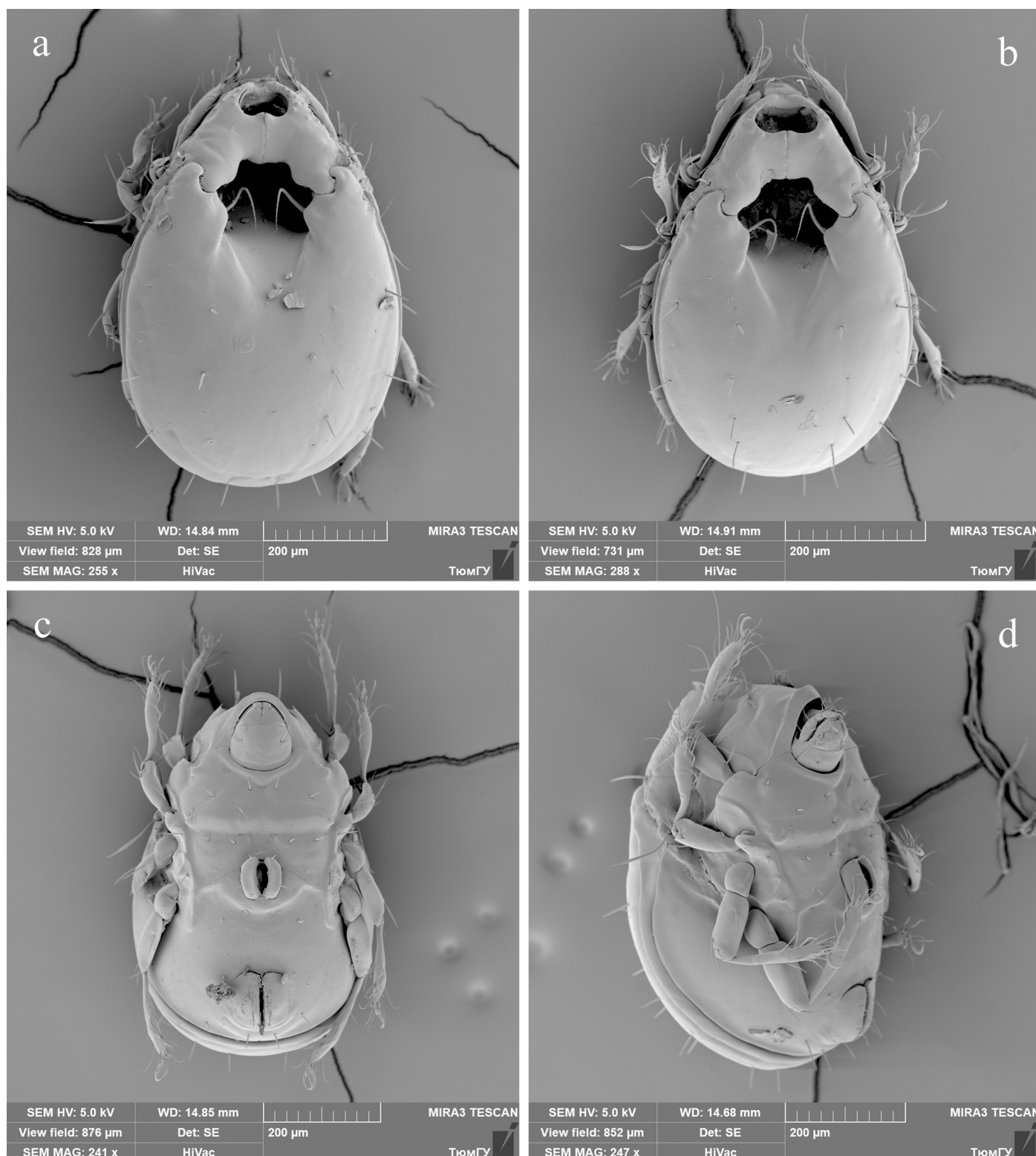


Figure 4 *Leobodes becki* n. sp., adult, SEM micrographs: a, b – dorsal view; c – ventral view; d – ventrolateral view.

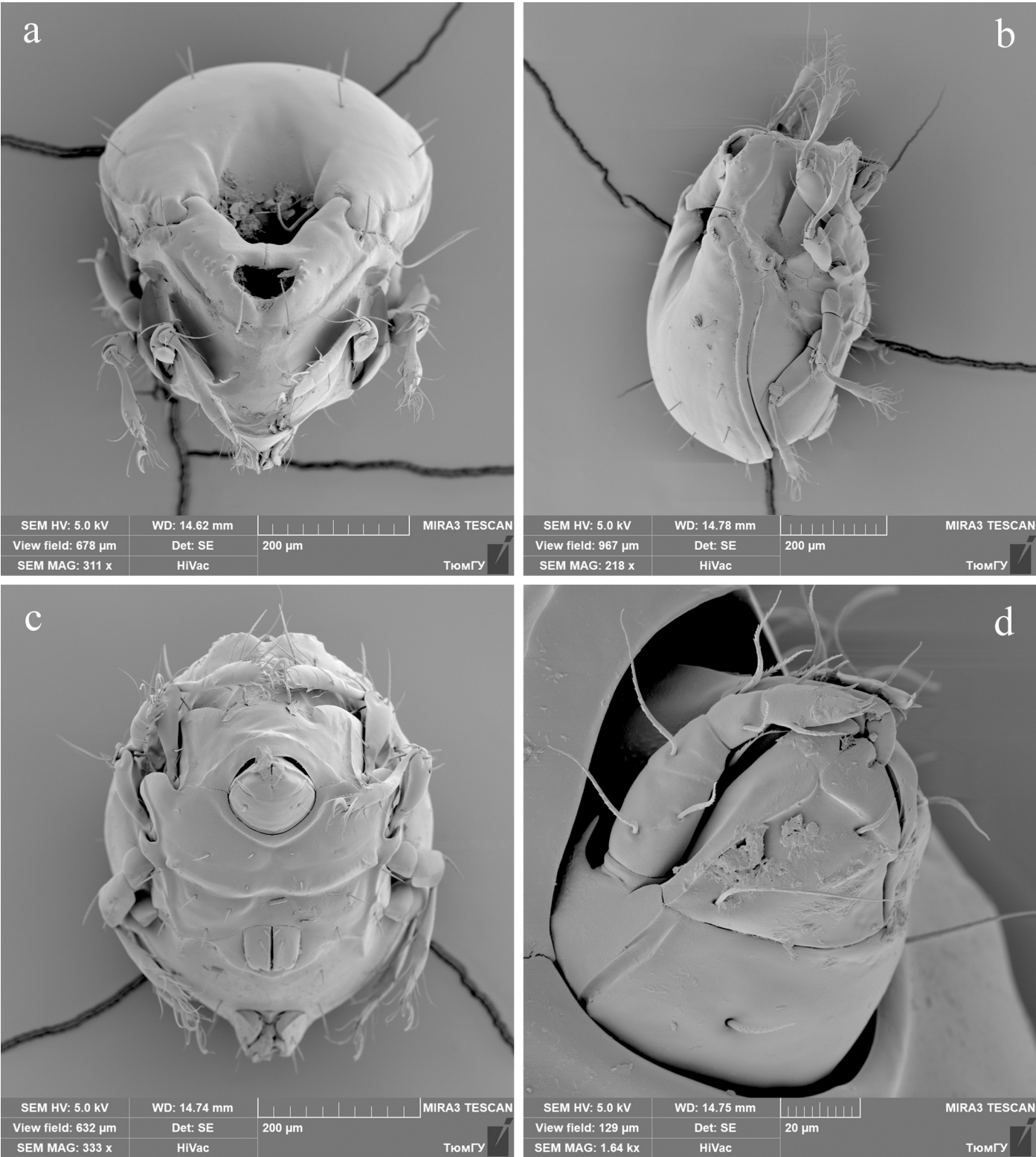


Figure 5 *Leobodes becki* n. sp., adult, SEM micrographs: a – dorsoanterior view; b – lateral view; c – ventroanterior view; d – subcapitulum, ventrolateral view.

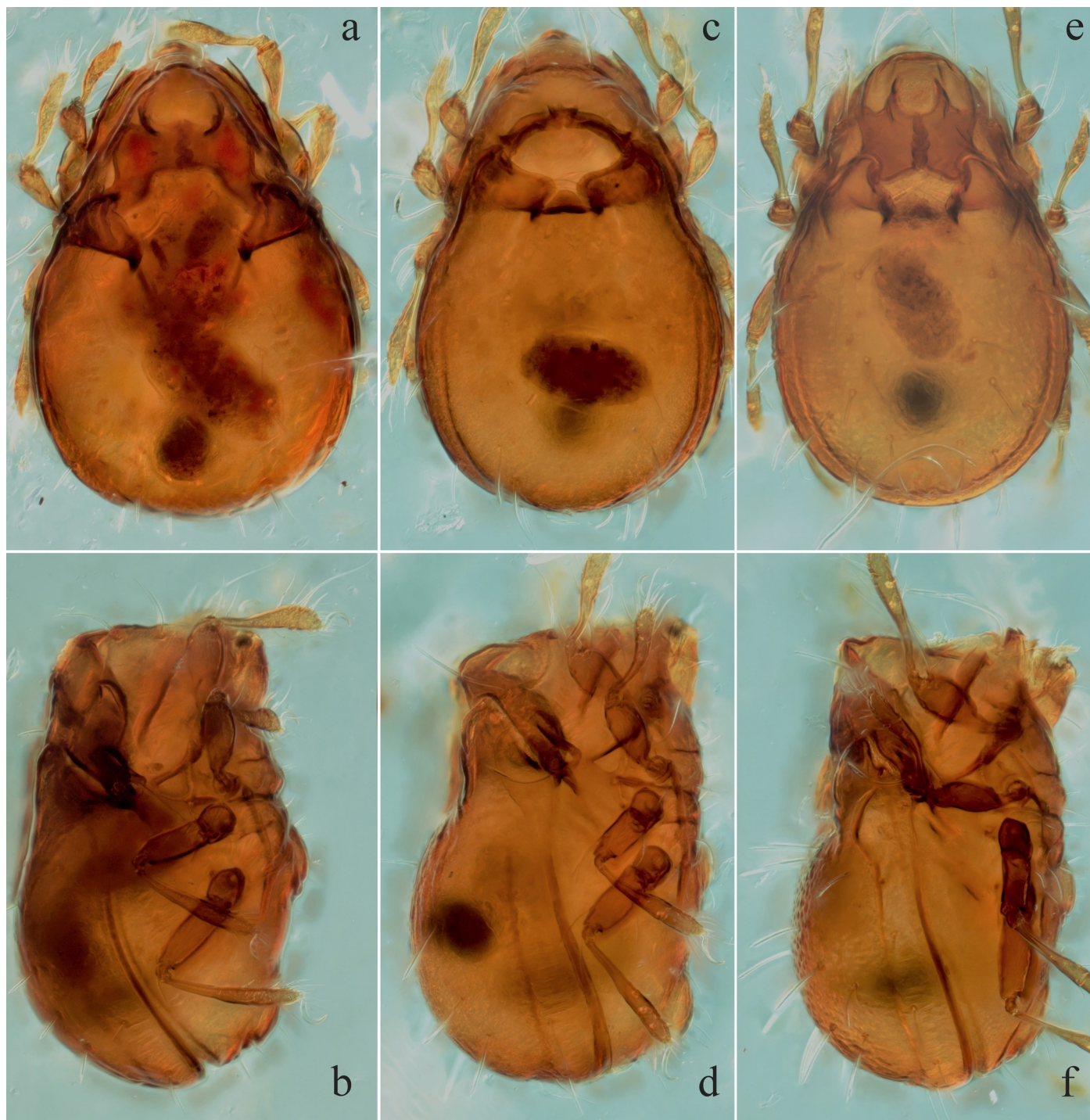


Figure 6 *Leobodes* spp., adult, microscope images: a – *L. becki* n. sp., dorsal view; b – *L. becki* n. sp., lateral view; c – *L. schalleri* n. sp., dorsal view; d – *L. schalleri* n. sp., lateral view; e – *L. schawalleri* n. sp., dorsal view; f – *L. schawalleri* n. sp., lateral view. Magnification: 400 (10 × 40).

seta of medium length, distinctly shorter than rostral and lamellar setae (versus long, not shorter than rostral and lamellar setae) directed posterolaterad (versus erect) in dorsal view. Also, *L. praeconcavus* has smooth (versus barbed) notogastral setae (except c) of medium length, *lm* reaching insertion *lp* (versus short, *lm* not reaching insertion *lp*); *L. yinae* has bifurcate (versus

Table 1 Leg setation and solenidia of adult *Leobodes becki* n. sp., *L. schalleri* n. sp. and *L. schawalleri* n. sp.

Leg	Tr	Fe	Ge	Ti	Ta
I	v'	d, (l), bv''	l', v', σ	(l), (v), φ ₁ , φ ₂	(ft), (tc), (it), (p), (u), (a), s, (pv), ε, ω ₁ , ω ₂
II	v'	d, (l), bv''	l', v', σ	(v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv), ω ₁ , ω ₂
III	l', v'	d, l', ev'	σ	(v), φ	(ft), (tc), (it), (p), (u), (a), s, (pv)
IV	v'	d, ev'	d	(v), φ	ft'', (tc), (p), (u), (a), s, (pv)

Note: Roman letters refer to normal setae (except ε = famulus); Greek letters refer to solenidia. Single quotation mark (') marks setae on the anterior and double quotation mark (") setae on the posterior side of a given leg segment; parentheses refer to a pair of setae.

simple) notogastral seta *c* and foveolate (versus not foveolate) notogaster.

Leobodes schalleri n. sp.

Zoobank: [AF04EB0D-0961-4E91-AB72-1CAC5CDFC15E](https://zoobank.org/AF04EB0D-0961-4E91-AB72-1CAC5CDFC15E)

(Figures 3e, 3f, 6c, 6d, 7a-c, 8a-d, 9a-d)

Diagnosis — Adult. Body size: 664–730 × 431–498. Body surface with dense granulate microsculpturing; dorsal part of notogaster with sparse, small foveolae, anogenital region partially with dense, larger foveolae. Prodorsal processes connected medially at a small distance; their anterior parts not forming prodorsal aperture. Rostral, lamellar and interlamellar setae slightly thickened; *in* shortest, erect. Bothridial seta with distinctly lanceolate head having short attenuate tip. Notogastral tubercle present. Distance between medial notogastral condyles comparatively short. Ten pairs of notogastral setae present: seta *c* broadly phylliform, straight; other setae of medium length, thickened. Subcapitular seta *h* bacilliform. Seta *l'* on trochanter III of medium length, setiform; *v'* on leg trochanters III, IV long, thick.

Description of adult — Measurements – Body length: 680 (holotype: male), 664–730 (14 paratypes: five males and nine females); body width: 431 (holotype), 431–498 (14 paratypes).

Integument – Body color brown. Body surface with dense granulate microsculpturing. Prodorsum close to insertions of lamellar setae and partially tutorium and pedotectum I with slight short ribs and tubercles (diameter of tubercle up to 10). Region between bothridium and acetabula I–III densely tuberculate (diameter of tubercle up to 4). Dorsal part of notogaster with sparse, small foveolae (diameter of foveola up to 4). Anogenital region (except ventrolateral parts and region between genital and anal apertures) with dense, larger foveolae (diameter of foveola up to 10).

Prodorsum – Rostrum rounded. Lateral carinae not fused medially before rostral margin; each carina fused with lateral margin of rostrum. Lamella slightly developed. Prolamella present, but inconspicuous. Tutorium and prodorsal hollow of prodorsum well developed. Prodorsal processes connected medially at a relatively small (as long as diameter of bothridium) distance. Anterior part of prodorsal processes without prodorsal aperture anteriorly to connecting region. Rostral (184–188), lamellar (176–180) and interlamellar (143–151) setae slightly thickened, slightly barbed; *ro* with slightly attenuate tip; *le* inserted on distinct tubercle; *in* erect. Distance *in*–*le* distinctly longer than *le*–*ro*. Inconspicuous carina developed between insertions of rostral setae. Bothridial seta (118–127) with long stalk and short, distinctly lanceolate head having short attenuate tip, roughened.

Notogaster – Carina originate from medial part of medial notogastral condyle and directed to lyrifissure *im*. Notogastral tubercle present. Distance between medial notogastral condyles comparatively short (distinctly shorter than distance between setae *lm*–*lm*). Median part of notogaster with one pair of longitudinal inconspicuous furrows. Ten pairs of notogastral setae present: seta *c* (65–69) broadly phylliform, roughened, straight, directed anteromediad; *h*₃,



Figure 7 *Leobodes schalleri* n. sp., adult: a – dorsal view (legs omitted); b – ventral view (gnathosoma and legs omitted); c – lateral view (gnathosoma and legs omitted). Scale bar 100 μ m.

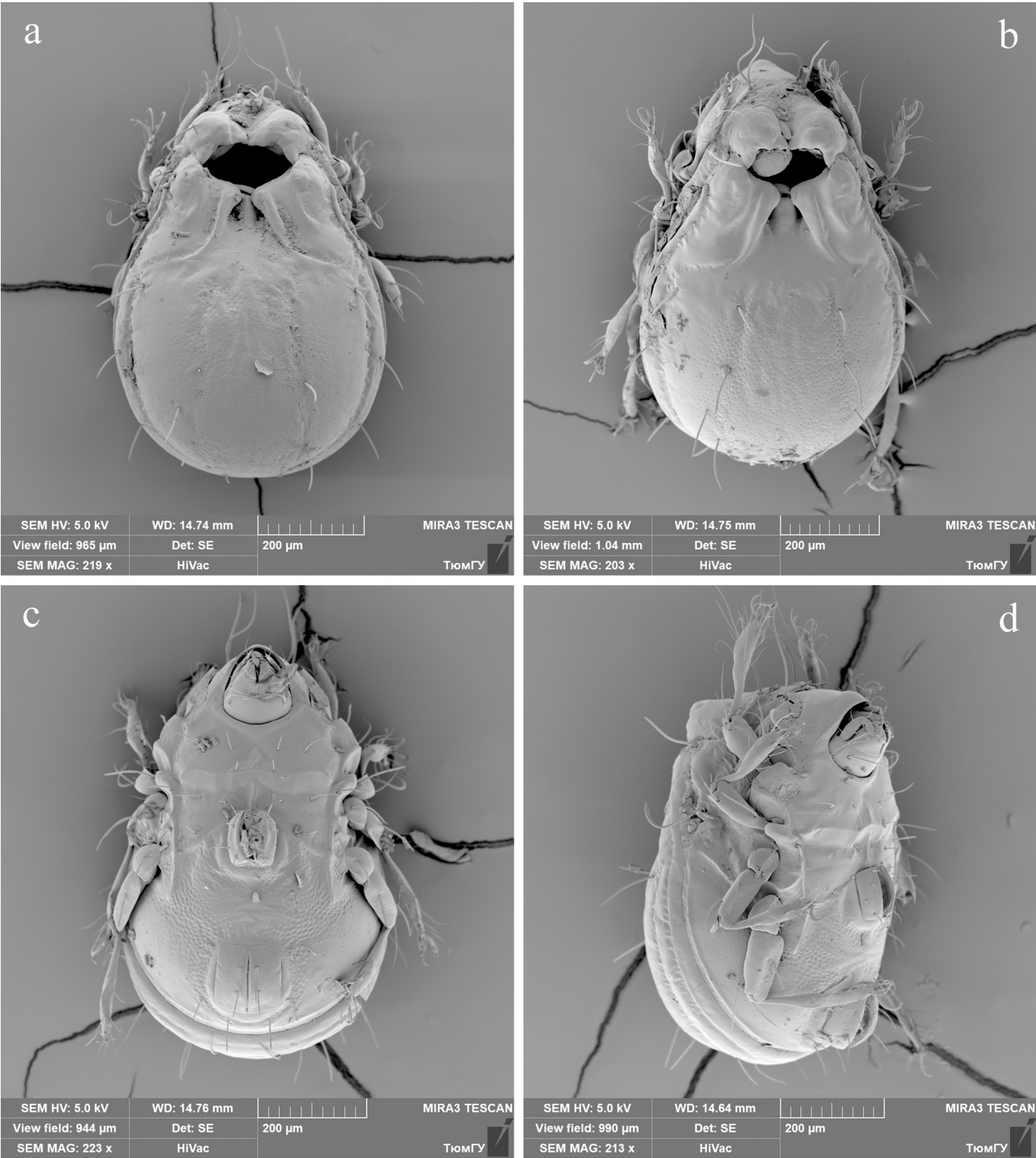


Figure 8 *Leobodes schalleri* n. sp., adult, SEM micrographs: a, b – dorsal view; c – ventral view; d – ventrolateral view.

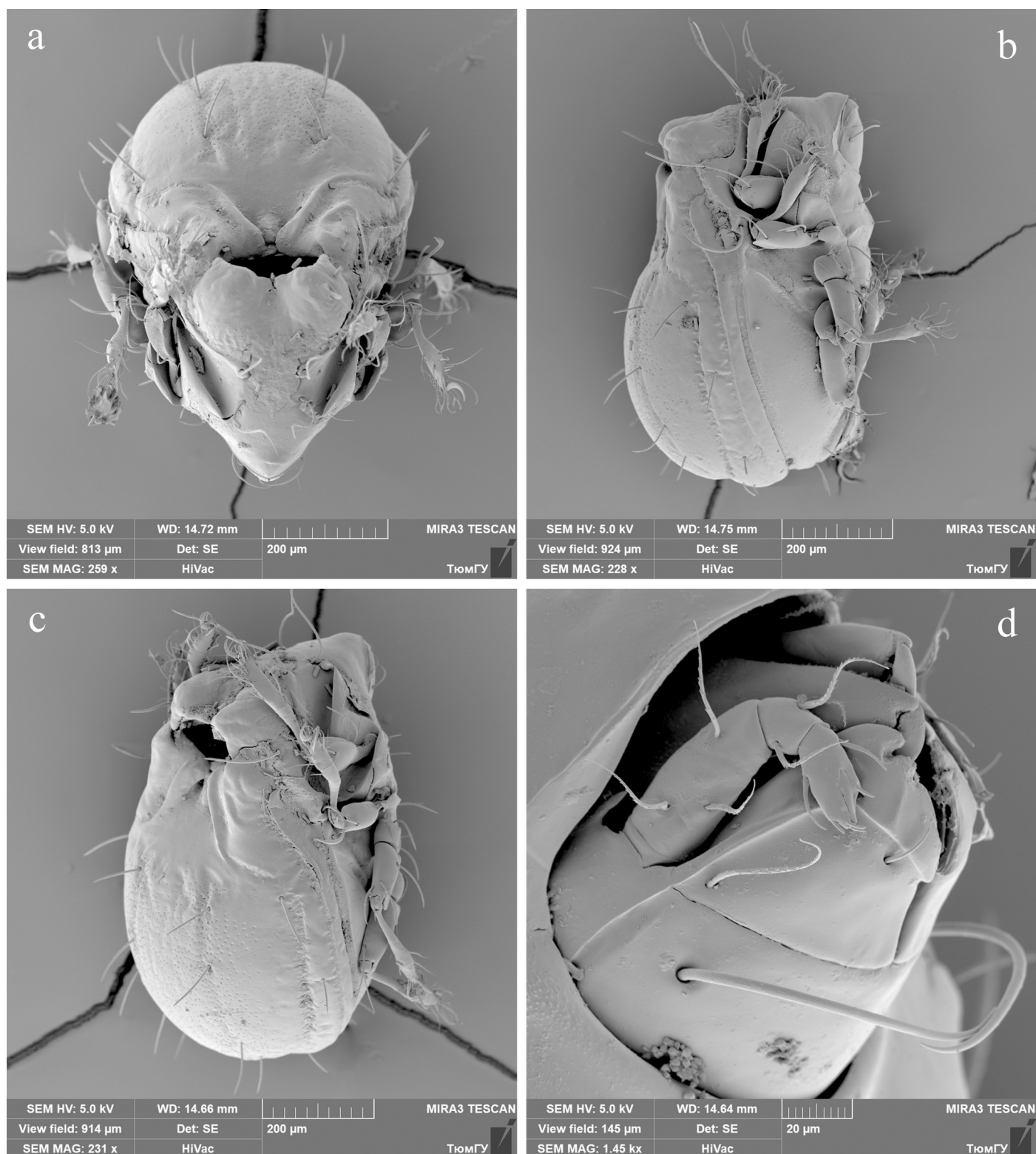


Figure 9 *Leobodes schalleri* n. sp., adult, SEM micrographs: a – dorsoanterior view; b – lateral view; c – dorsolateral view; d – subcapitulum, ventrolateral view.

p_1 – p_3 (65–69) and others (77–90) thickened, barbed. Opisthonotal gland opening and all lyrifissures distinct.

Gnathosoma – Mostly similar to *Leobodes becki* **n. sp.** Subcapitulum size: 143–151 × 123–131. Subcapitular setae *a* (16) and *m* (57–61) with attenuate tip, slightly barbed; *h* (98–102) bacilliform, smooth; *a* thinnest, *h* thickest. Palp length: 82–86. Length of postpalpal seta: 10. Chelicera length: 180–188. Length of *cha*: 53–57; *chb*: 22–24.

Epimeral and lateral podosomal regions – Epimeral setae *1b*, *3b* (49–53), *3c* (65–69), *4c* (73–77) thickened, barbed; other setae (32–36) thin, with attenuate tip, slightly barbed; *4c* thickest. Ventrolateral tubercle on epimere II distinct. Discidium slightly developed.

Anogenital region – Genital seta (32–36) thin, with attenuate tip, slightly barbed. Aggenital (45–53), anal (45–53) and adanal (*ad*₁, *ad*₂: 45–53; *ad*₃: 45–53) setae thickened, barbed. Adanal lyrifissure distinct.

Legs – Mostly similar to *Leobodes becki* **n. sp.**, but seta *v'* on trochanters III, IV long, thick.

Material examined — Nepal, Panchthar District, Dhorpar Kharka, 27°05'N, 87°55'E, 2700 m a.s.l., soil-litter in mature *Rhododendron-Lithocarpus* forest (sample No. 324), 13–16.IV.1988 (collected by J. Martens and W. Schawaller).

Type deposition — The holotype and one paratype are deposited in the collection of the SMNH; 13 paratypes are deposited in the collection of the TSUMZ.

Etymology — This new species is dedicated to Friedrich Schaller (1920–2018), a famous German-Austrian zoologist. Among his numerous fields of research he was dedicated to ecology and behaviour of Collembola and other soil-bound invertebrates. For example, he discovered the indirect sperm transfer of collembolans.

Remarks — *Leobodes schalleri* **n. sp.** differs from all representatives of the genus by the presence of broadly phylliform (versus setiform or slightly phylliform only in basal part) notogastral setae *c*.

Leobodes schawalleri **n. sp.**

Zoobank: [xxxxxxxxxxxxxxxxxxxx](https://zoobank.org/xxxxxxxxxxxxxxxxxxxx)

(Figures 3g, 3h, 6e, 6f, 10a–c, 11a–d, 12a–d)

Diagnosis — Adult. Body size: 597–664 × 365–431. Body surface with dense granulate microsculpturing; notogaster and partially anogenital region foveolate. Prodorsal processes connected medially at a relatively large distance; their anterior parts forming rounded prodorsal aperture. Rostral, lamellar and interlamellar setae slightly thickened; *in* shortest, erect. Bothridial seta with distinctly lanceolate head. Notogastral tubercle present. Distance between medial notogastral condyles comparatively short. Thirteen pairs of notogastral setae present: seta *c* long, with slightly phylliform basal part and attenuate mediobasal part, straight; other setae of medium length, thickened. Subcapitular seta *h* setiform. Seta *l'* on trochanter III and *v'* on leg trochanters III, IV long, thick.

Description of adult — Measurements – Body length: 664 (holotype: female), 597–664 (16 paratypes: four males and 12 females); body width: 431 (holotype), 365–431 (16 paratypes).

Integument – Body color brown. Body surface with dense granulate microsculpturing. Tutorium and pedotectum I foveate. Region between bothridium and acetabula I–III densely tuberculate (diameter of tubercle up to 4). Notogaster with sparse foveolae (diameter of foveola up to 10). Anogenital region (except ventrolateral parts and region between genital and anal apertures) with more dense foveolae (diameter of foveola up to 10).

Prodorsum – Rostrum rounded. Lateral carinae fused medially before rostral margin. Lamella slightly developed. Prolamella present, but inconspicuous. Tutorium and prodorsal hollow of prodorsum well developed. Prodorsal processes connected medially at a relatively large distance. Anterior part of prodorsal processes have rounded prodorsal aperture (fused with prodorsal hollow) anteriorly to connecting region. Rostral (192–205), lamellar (180–192) and interlamellar (151–155) setae slightly thickened, slightly barbed; *ro* with slightly attenuate



Figure 10 *Leobodes schawalleri* n. sp., adult: a – dorsal view (legs omitted); b – ventral view (gnathosoma and legs omitted); c – lateral view (gnathosoma and legs omitted). Scale bar 100 μ m.

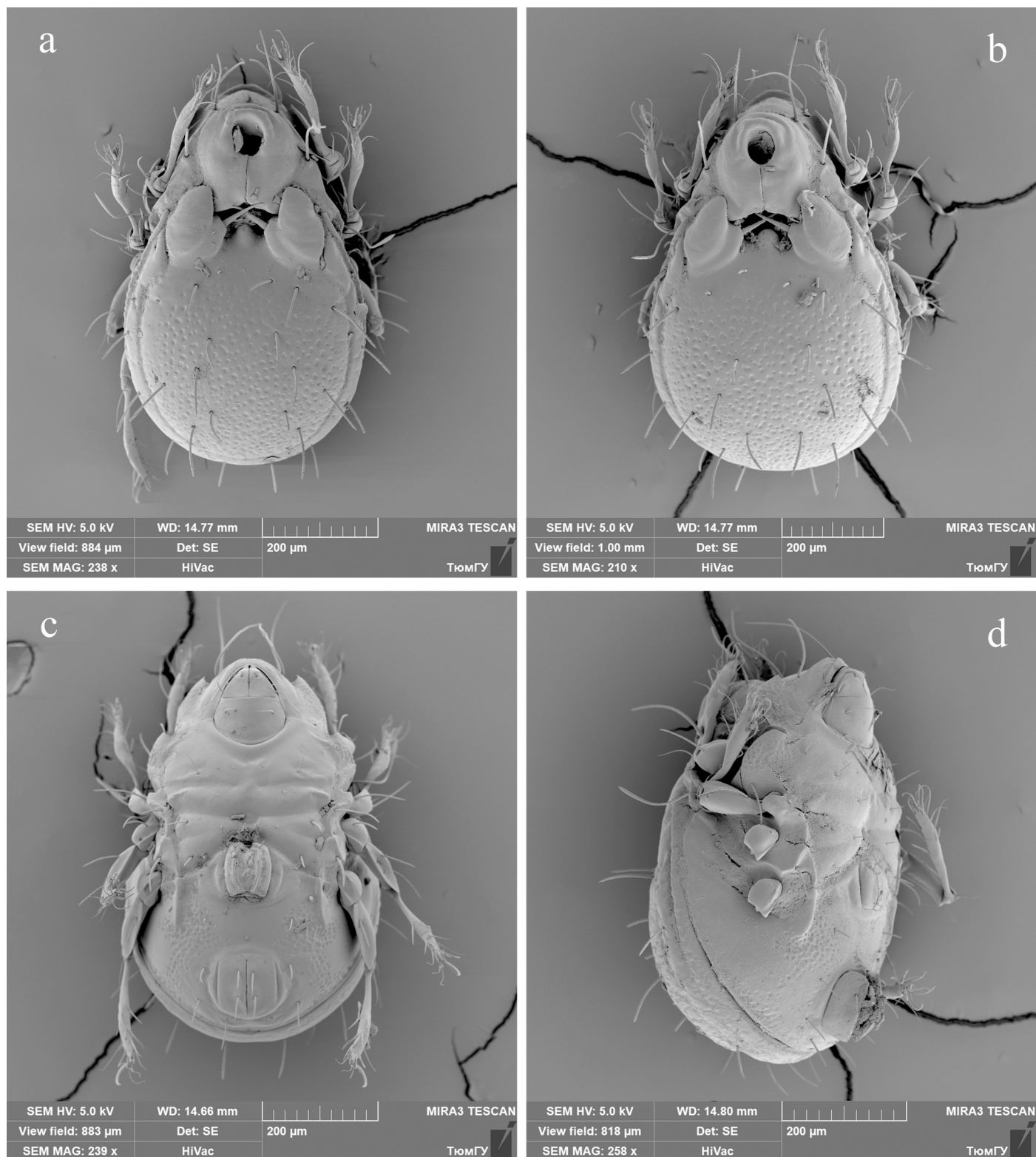


Figure 11 *Leobodes schawalleri* n. sp., adult, SEM micrographs: a, b – dorsal view; c – ventral view; d – ventrolateral view.

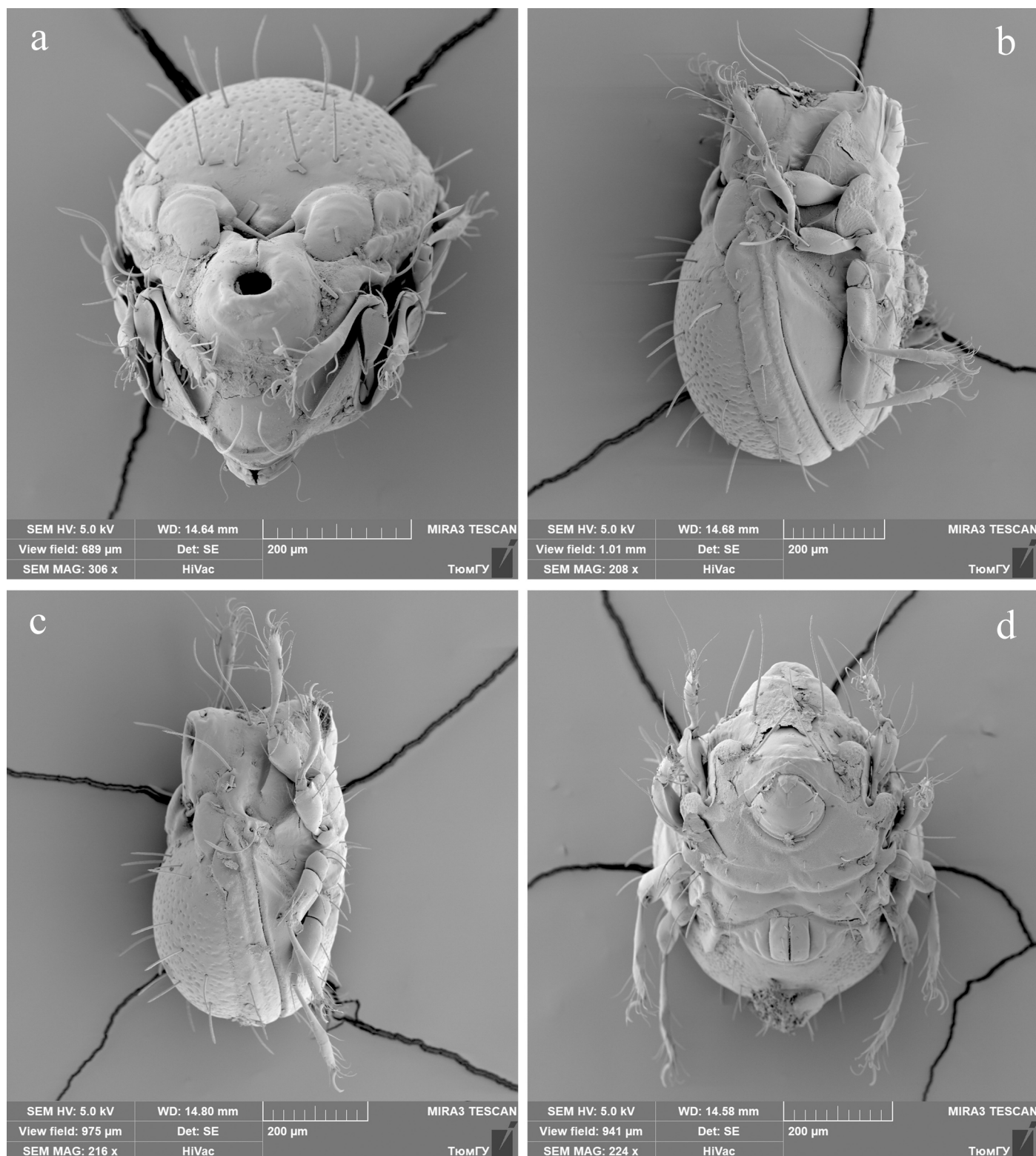


Figure 12 *Leobodes schawalleri* n. sp., adult, SEM micrographs: a – dorsoanterior view; b, c – lateral view; d – ventroanterior view.

tip; *le* inserted on distinct tubercle; *in* erect. Distance *in-le* equally to *le-ro*. Slight carina developed between insertions of rostral setae. Bothridial seta (127–135) with long stalk and short, distinctly lanceolate head, roughened.

Notogaster – Notogastral tubercle present. Distance between medial notogastral condyles comparatively short (distinctly shorter than distance between setae *lm-lm*). Thirteen pairs of notogastral setae present: seta *c* (114–118) with phylliform basal part and attenuate mediodistal part and flexible tip, roughened, straight, directed anteromediad; *h*₃, *p*₁–*p*₃ (57–65) and others (82–90) thickened, barbed. Opisthonotal gland opening and all lyrifissures distinct.

Gnathosoma – Mostly similar to *Leobodes becki* **n. sp.** Subcapitulum size: 143–151 × 123–131. Subcapitular setae (*a*: 16; *m*, *h*: 65–69) with attenuate tip, slightly barbed; *a* thinnest. Palp length: 73–77. Length of postpalpal seta: 10. Chelicera length: 180–188. Length of *cha*: 53–57; *chb*: 22–24.

Epimeral and lateral podosomal regions – Epimeral setae *1b*, *3b*, *4a* (41–49), *3c*, *4c* (61–69) thickened, barbed; other setae (24–32) thin, with attenuate tip, slightly barbed; *4c* thickest. Ventrolateral tubercle on epimere II distinct. Discidium with triangular tip.

Anogenital region – Genital seta (28–32) thin, with attenuate tip, slightly barbed. Aggenital (36–41), anal (36–41) and adanal (*ad*₁, *ad*₂: 49–53; *ad*₃: 36–41) setae thickened, barbed. Adanal lyrifissure distinct.

Legs – Mostly similar to *Leobodes becki* **n. sp.**, but seta *l'* on trochanter III and *v'* on trochanters III, IV long, thick.

Material examined — Nepal, Panchthar District, Dhorpar Kharka, 27°05'N, 87°55'E, 2700 m a.s.l., soil-litter in mature *Rhododendron-Lithocarpus* forest (sample No. 324), 13–16.IV.1988 (collected by J. Martens and W. Schawaller).

Type deposition — The holotype and one paratype are deposited in the collection of the SMNH; 15 paratypes are deposited in the collection of the TSUMZ.

Etymology — The specific name is dedicated to Dr. Wolfgang Schawaller, well known entomologist, active participant and collector of the J. Martens expeditions to various parts of Europe and Asia, until recently working at State Museum of Natural History, Stuttgart, Germany.

Remarks — *Leobodes schawalleri* **n. sp.** differs from all representatives of the genus by the presence of 13 pairs (versus 10) of notogastral setae.

Key to known species of *Leobodes*

1. Prodorsal aperture (anteriorly to connecting region) absent 2
— Prodorsal aperture (anteriorly to connecting region) present 5
2. Notogastral seta *c* broadly phylliform; notogastral tubercle present; prodorsal processes shortly connected medially; body size: 664–730 × 431–498
..... *Leobodes schalleri* **n. sp.** Distribution: Nepal.
— Notogastral seta *c* setiform; notogastral tubercle absent; prodorsal processes longly connected medially 3
3. Notogastral seta *c* bent in mediodistal part and directed posteriad; surface of notogaster not rugose and foveolate; body size: 540–582 × 376–412
..... *Leobodes mirabilis* Aoki, 1965. Distribution: Oriental region.
— Notogastral seta *c* straight, directed anteromediad; surface of notogaster rugose or foveolate 4
4. Surface of notogaster rugose; notogastral seta *c* about as long as distance between notogastral medial condyles; prodorsal processes longly connected medially; body size: 645 × 400
..... *Leobodes carinatus* Chen and Wang, 2007. Distribution: China.
— Surface of notogaster foveolate; notogastral seta *c* distinctly shorter than distance between

notogastral medial condyles; prodorsal processes shortly connected medially; body size: 852–875 × 550–590 *Leobodes lijiangensis* Aoki, 2000. Distribution: Oriental region.

5. Notogastral seta *c* bent in mediodistal part and directed posteriad; distance between notogastral medial condyles about as long as distance between notogastral setae *lm–lm* 6

— Notogastral seta *c* straight, directed anteromediad; distance between notogastral medial condyles distinctly shorter than distance between notogastral setae *lm–lm* 9

6. Surface of notogaster foveolate; notogastral seta *c* bifurcate; body size: 628 × 430 *Leobodes yinae* Aoki, 2000. Distribution: China.

— Surface of notogaster not foveolate; notogastral seta *c* not bifurcate 7

7. Interlamellar seta comparatively short, directed posterolaterad; dorsal notogastral setae comparatively short; body size: 531–630 × 332–431 *Leobodes becki* n. sp. Distribution: Nepal.

— Interlamellar seta long, erect; dorsal notogastral setae of medium length 8

8. Notogastral setae of medium length, smooth; prodorsal aperture oval, transversely oriented; body size: 665 × 420 *Leobodes praeconcaus* Chen and Wang, 2007. Distribution: China.

— Notogastral setae comparatively long, barbed; prodorsal aperture nearly rounded; body size: 610–750 × 302–400 *Leobodes trypsis* Fernandez, Theron and Leiva, 2018. Distribution: Vietnam.

9. Prodorsal aperture heart-shaped; 10 pairs of notogastral setae present; notogastral tubercle absent; body size: 663–745 × 408–485 *Leobodes anulatus* Aoki, 1965. Distribution: Himalaya.

— Prodorsal aperture rounded; 13 pairs of notogastral setae present; notogastral tubercle present; body size: 597–664 × 365–431 *Leobodes schawalleri* n. sp. Distribution: Nepal.

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