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Description of the morphology of the first Ethiopian  
*Achipteria* BERLESE, 1885  
(Acari: Oribatida)

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ABSTRACT. A new oribatid mite of the genus *Achipteria* from southern Ethiopia is described and illustrated in detail. Specimens of *A. baleensis* sp. n. were collected in soil and moss from trees from Harena Forest of Bale Mountains National Park. The new species is similar to the *Achipteria* species-group (name of the species group must not be formed with a genus name) with the presence of point lateral cusp on lamella, long notogastral setae and long sensilli. However, it selectively differs from other species by the body size, morphology of sensilli and tibia, body surface, length of interlamellar and notogastral setae. The new species is the first and only record for *Achipteria* in the Ethiopian region.

Key words: acarology, taxonomy, oribatid mites, new species, *Achipteria* BERLESE, 1885, Ethiopia.

#### INTRODUCTION

The oribatid mite of the family Achipteriidae THOR, 1929 comprises 89 species from eight genera (SUBÍAS 2004, online version 2011): *Achipteria* BERLESE, 1885, *Anachipteria* GRANDJEAN, 1932, *Campachipteria* AOKI, 1995, *Cerachipteria* GRANDJEAN, 1935, *Cubachipteria* BALOGH & MAHUNKA, 1979, *Dentachipteria* NEVIN, 1974, *Parachipteria* HAMMEN, 1952, *Plakoribates* POPP, 1960. All listed taxa collectively distribute in the Holarctic, Oriental and Neotropical regions.

*Achipteria* is the most species-rich genus of Achipteriidae family, which currently comprises 32 species (SUBÍAS 2004, online version 2011). In the course of taxonomic studies of the oribatid fauna of southern part of Ethiopia we recorded the new species of *Achipteria*, which is also the first note of it in Ethiopia. The new species is described below as *Achipteria baleensis* sp. n.

At present, juvenile stages have been described for some species of *Achipteria*, in particular: *A. acuta* BERLESE, 1908 (see SENICZAK 1978; CHISTYAKOV 1988), *A. coleoprata* (LINNAEUS, 1758) (see SENICZAK 1978), *A. italica* (OUDEMANS, 1914) (see CHISTYAKOV 1994). Unfortunately, we have not found juvenile stages of the new species, and therefore we do not describe them in the paper.

## MATERIAL AND METHODS

Specimens were studied in lactic acid, mounted in temporary cavity slides for the duration of the study and then stored in 70% alcohol in tubes. All body measurements are presented in micrometres. Body length was measured in lateral view, from the tip of the rostrum to the posterior edge of the ventral plate, to avoid discrepancies caused by different degrees of notogastral distension. Notogastral width refers to the maximum width in dorsal view. Length of body setae was measured in lateral view. Formulae of leg setation are given in parentheses according to sequence of trochanter–femur–genu–tibia–tarsus (famulus included). Formulae of leg solenidia are given in square brackets according to sequence of genu–tibia–tarsus.

## DESCRIPTION OF NEW SPECIES

### *Achipteria baleensis* sp. n.

(Figs. 1-23)

#### DIAGNOSIS

New species is distinguished by the following combination of character states: body size 647-697 × 448-464; surface of notogaster, anogenital region and anal plates foveolae; lamellae with point lateral tooth; interlamellar setae not reaching distal parts of lamellae; sensilli clavate, with long stalk and oblong, barbed head; notogastral setae long; tutoria reaching rostral border.

#### DESCRIPTION

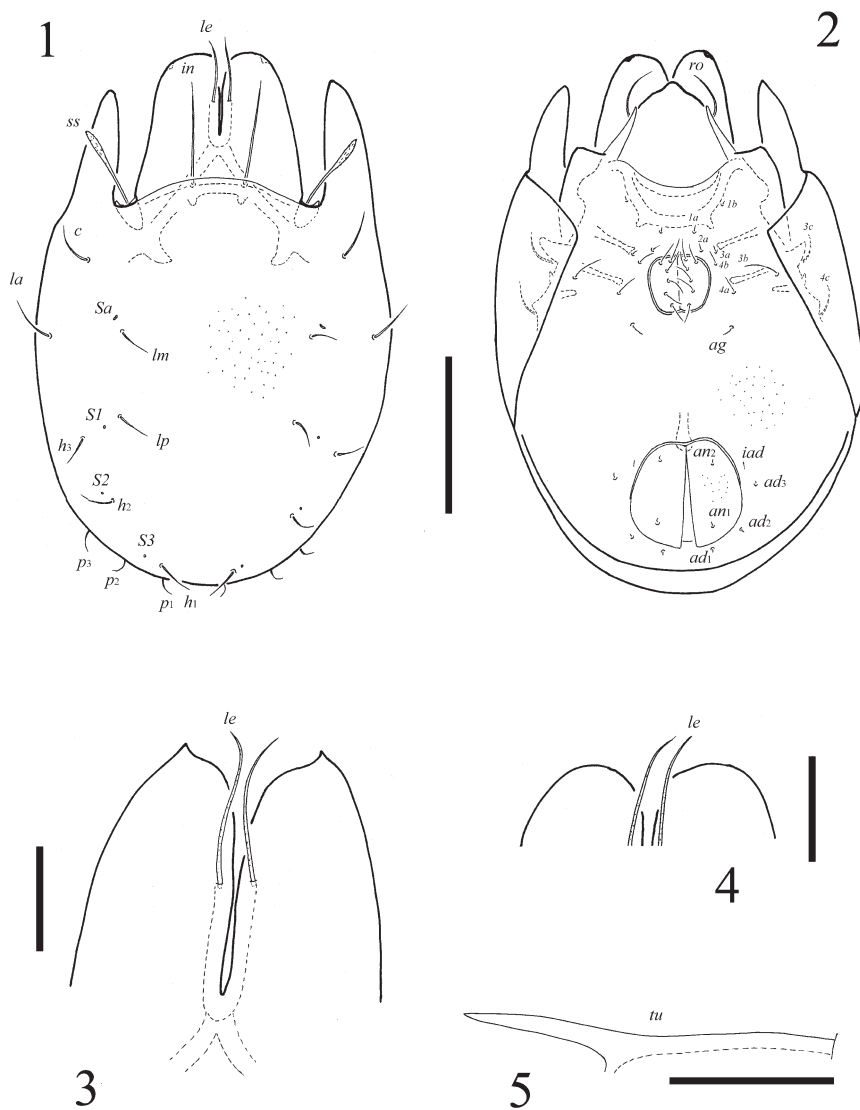
*Measurements* – Body length 647 (holotype), 647-697 (average 677, five paratypes); body width 448 (holotype), 448-464 (average 461, five paratypes).

*Integument* – Body colour: brown - black. Notogaster, anogenital region and anal plates with very small foveolae (sometimes hardly visible).

*Prodorsum* (Figs. 1, 3-9) – Rostrum rounded. Lamellae broad, separate medially, only in the middle fused shortly, extending far beyond the tip of the rostrum. Distal parts of lamellae rounded apically in dorsal view; with pointed lateral tooth in dorso-anterior

view. Rostral, lamellar (both 73-82) and interlamellar (151-172) setae setiform, slightly barbed. Interlamellar setae not reaching distal parts of lamellae. Sensilli (94-110) clavate, with long stalk and oblong, barbed head.

*Notogaster* (Figs. 1, 10-12) – Dorsosejugal suture convex medially. Pteromorphs strongly curved ventrally. Lenticulus large, with indistinct margins. Ten pairs of setiform, smooth notogastral setae; *c* and *la* longest (65-69),  $p_1$ - $p_3$  shortest (28-36), others of



1-5. *Achipteria baleensis* sp. n.: 1 – Dorsal view; 2 – Ventral view (without gnathosoma and legs); 3 – Medio-distal part of lamellae, antero-dorsal view; 4 – Distal parts of lamellae and lamellar setae, dorsal view; 5 – Turtorium. Scale bar 1, 2: 200  $\mu$ m, scale bar 3-5: 50  $\mu$ m

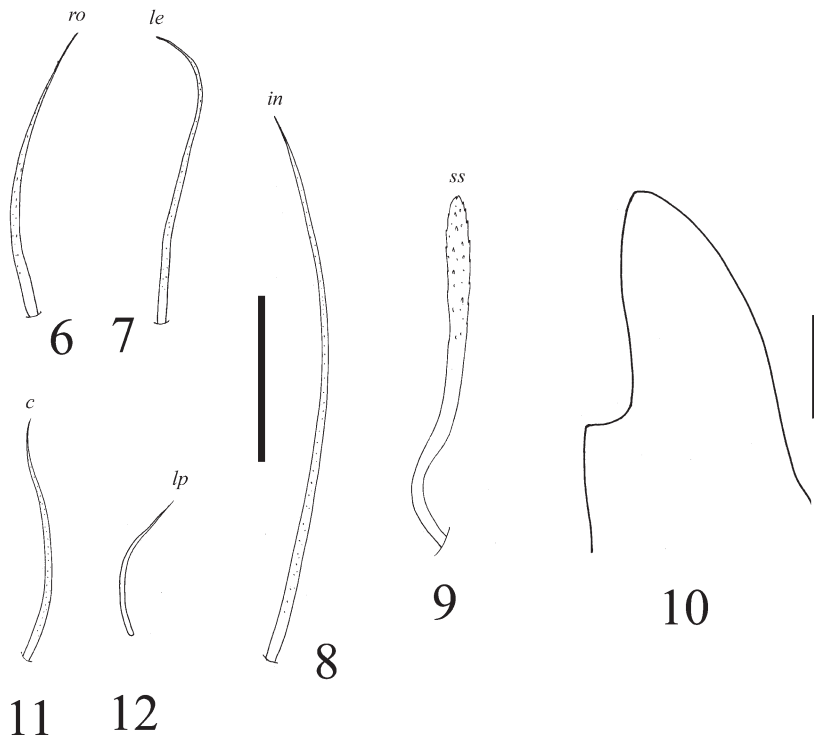
medium size (41-45). Sacculi *Sa* oblonged, well developed; *S1*, *S2*, *S3* rounded, very small, hardly visible. Opisthosomal gland openings and lyrifissures weakly visible, developed in typical arrangement for genus.

*Lateral part of body* (Fig. 5). Exobothridial setae not observed. Tutoria (*tu*) long, reaching rostral border, with free tip.

*Anogenital region* (Figs. 2, 13-15) – Six pairs of genital setae ( $g_1$ – $g_6$ , 36-41); one pair of aggenital setae (*ag*, 20); two pairs of anal ( $an_1$ ,  $an_2$ , 8) and three pairs of adanal setae ( $ad_1$ – $ad_3$ , 8). All setae setiform, smooth. Ovipositor: length of lobes 69-73, length of cylindrical distal part (bDp) 73-82, width of cylindrical distal part 49-57. All setae of ovipositor setiform, smooth. Lobe setae  $\psi_1 \approx \tau_1$  (28-32) longer than  $\psi_2 \approx \tau_a \approx \tau_b \approx \tau_c$  (73-82). Six coronal setae *k* short (8-10) present.

*Epimeral region* (Figs. 2, 16) – The shape of the apodemes and epimeral borders typical for the genus. Custodium (*cus*) thorn-like. Epimeral setal formula 2-1-3-3. Setae *1c* not observed. Setae setiform, smooth; medial setae *1a*, *1b*, *2a*, *3a* (12-16) shorter than others (32-61). Setae *3c* and *4c* inserted laterally.

*Gnathosoma* (Figs. 17-19) – Subcapitulum longer than wide: 143-147 × 118-127. Hypostomal setae *h* absent, only alveoli present; setae *a* (28-32) and *m* (36-41) seti-



6-12. *Achipteria baleensis* sp. n.: 6 – Rostral seta; 7 – Lamellar seta; 8 – Interlamellar seta; 9 – Sensillus; 10 – Pteromorphous cusp; 11 – Notogastral seta *c*; 12 – Notogastral seta *lp*. Scale bar 50  $\mu$ m

form, slightly barbed. Adoral setae (24-28) setiform, with curved distal part, barbed. Palp (length 90-98) with setation 0-2-1-3-9 (+1 $\omega$ ). Solenidion rod-like. Chelicera (length 164) chelate-dentate. Cheliceral setae long, setiform, barbed; *cha* (61) longer than *chb* (28).

*Legs* (Figs. 20-23) – Formulae of leg setation and solenidia: I (1-5-3-4-20) [1-2-2], II (1-5-3-4-15) [1-1-2], III (2-3-1-3-15) [1-1-0], IV (1-2-2-3-12) [0-1-0]; homology of setae and solenidia indicated in Table 1. Almost all setae slightly barbed (except, in particular, setae *p*, *ft*'' on leg I). Famulus short, blunt-ended. Seta *s* of tarsi II thick, with strong spines unilaterally. Ventral setae of femora I short (these setae on other legs very long). Solenidia  $\omega_1$  and  $\omega_2$  on tarsi II rod-like, other solenidia setiform.

#### MATERIAL EXAMINED

Six specimens were obtained from the southern Ethiopia, Bale Mountains National Park, Harena Forest (*Hagenia abissinica* forming the canopy), collected by L. B. Rybalov, 23.11.2009. Holotype and four paratypes obtained from: 6°38'N, 39°43'E, 1883 m.a.s.l. in soil; one paratype obtained from: 6°42'N, 39°43'E, 2249 m.a.s.l. in mosses on trees.

*Type deposition* – The holotype is deposited in the collection of Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia; three paratypes are deposited in the collection of Siberian Zoological Museum, Novosibirsk, Russia; two paratypes are in the personal collection of S.G. ERMILOV.

#### ETYMOLOGY

The new species is named after the Ethiopian Bale Mountains National Park.

#### DISTRIBUTION

At present, this species is only known from Ethiopia.

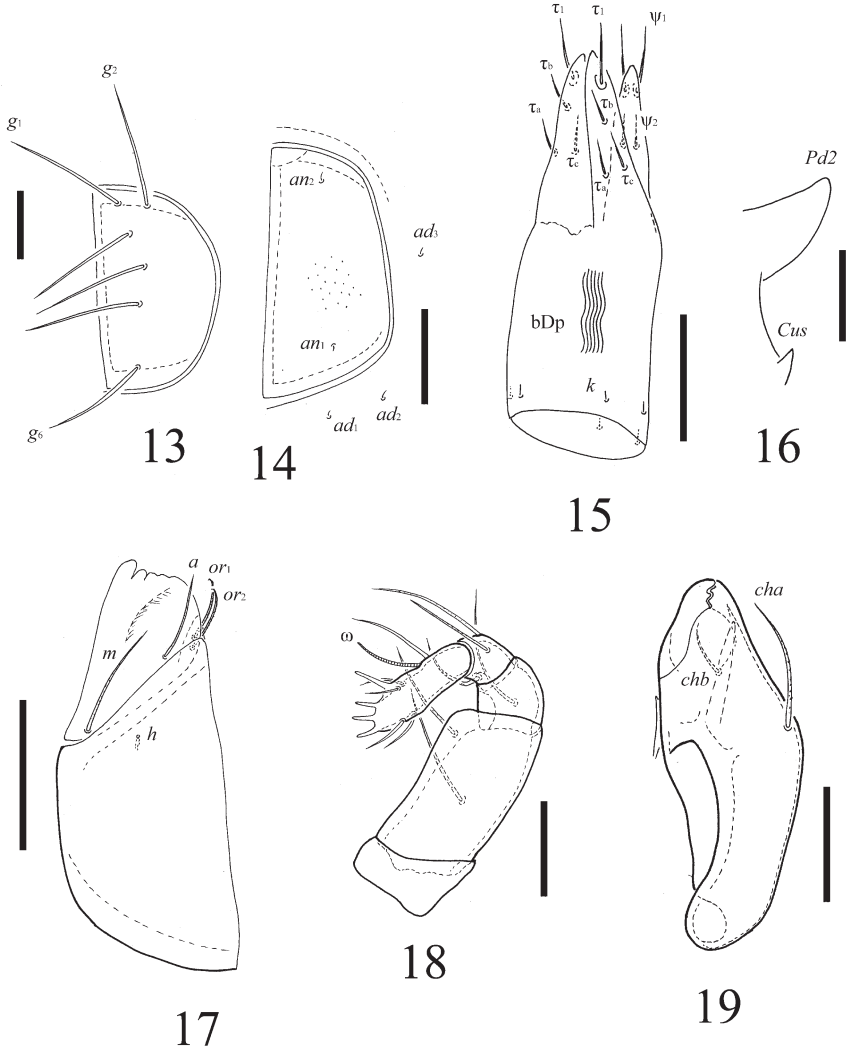
Table 1. Leg setation and solenidia of *Achipteria baleensis* sp. n.

Leg	Trochanter	Femur	Genu	Tibia	Tarsus
I	<i>v</i> '	<i>d</i> , ( <i>l</i> ), <i>bv</i> '', <i>v</i> ''	( <i>l</i> ), <i>v</i> ' , $\sigma$	( <i>l</i> ), ( <i>v</i> ), $\phi_1$ , $\phi_2$	( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> ), <i>v</i> ' , ( <i>pl</i> ), <i>l</i> '', <i>e</i> , $\omega_1$ , $\omega_2$
II	<i>v</i> '	<i>d</i> , ( <i>l</i> ), <i>bv</i> '', <i>v</i> ''	( <i>l</i> ), <i>v</i> ' , $\sigma$	( <i>l</i> ), ( <i>v</i> ), $\phi$	( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> ), $\omega_1$ , $\omega_2$
III	<i>l</i> ' , <i>v</i> '	<i>d</i> , <i>l</i> ' , <i>ev</i> '	<i>l</i> ' , $\sigma$	<i>l</i> ' , ( <i>v</i> ), $\phi$	( <i>ft</i> ), ( <i>tc</i> ), ( <i>it</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> )
IV	<i>v</i> '	<i>d</i> , <i>ev</i> '	<i>d</i> , <i>l</i> '	<i>l</i> ' , ( <i>v</i> ), $\phi$	<i>ft</i> '', ( <i>tc</i> ), ( <i>p</i> ), ( <i>u</i> ), ( <i>a</i> ), <i>s</i> , ( <i>pv</i> )

\*Roman letters refer to normal setae, *e* to famulus, Greek letters to solenidia. Single prime (') marks setae on anterior and double prime (") setae on posterior side of the given leg segment. Parentheses refer to a pair of setae.

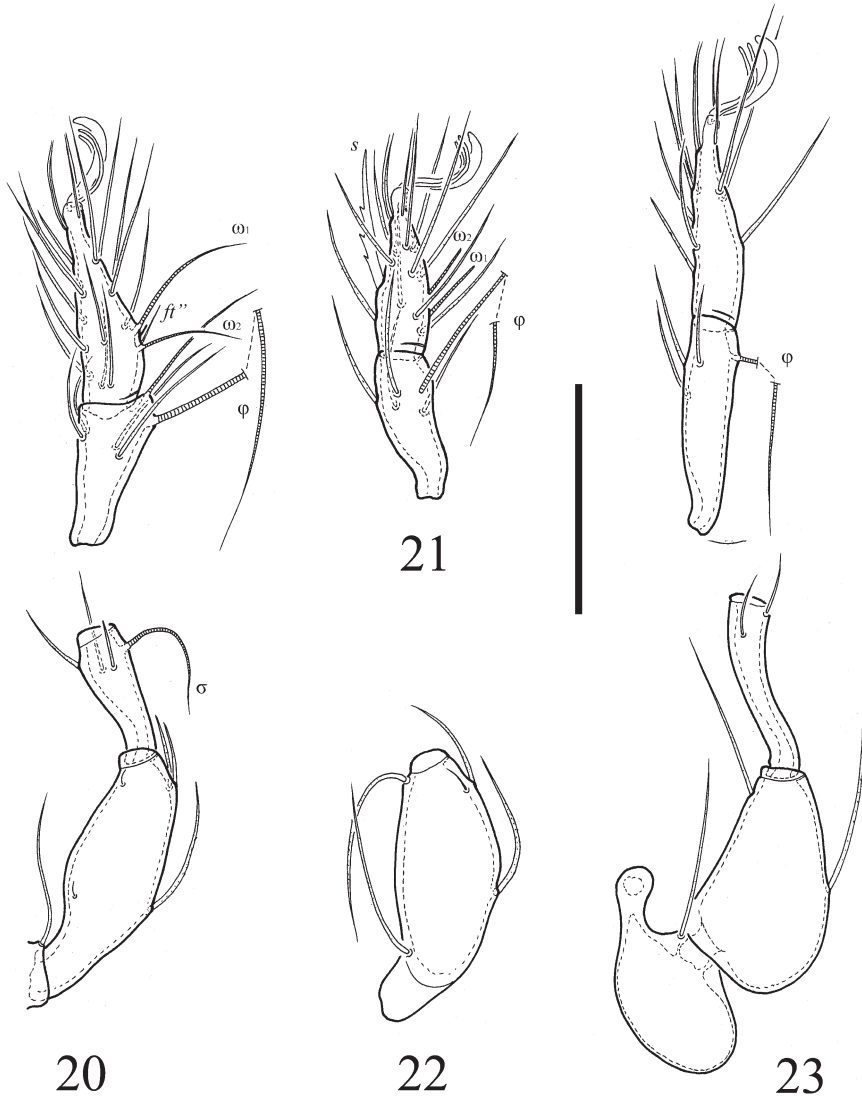
## REMARKS

*Achipteria baleensis* sp. n. can be included in the *Achipteria* species-group because of the presence of point lateral cusp on lamella, long notogastral setae and long sensilli. The most similar species are: *A. acuta* BERLESE, 1908 from the Holarctic region, *A. holomonensis* CANCELA DA FONSECA and STAMOU, 1987 from Greece, *A. italica* (OUDEMANS, 1914) from Europe, *A. longisetosus* WEIGMANN and MURVANIDZE, 2003 from Caucasus (see accordingly BERLESE 1908; CANCELA DA FONSECA & STAMOU 1987; OUDEMANS 1927;



13–19. *Achipteria baleensis* sp. n.: 13 – Genital plate, left; 14 – Anal plate, left and adanal setae; 15 – Ovipositor; 16 – Pedotecta I and custodium; 17 – Subcapitulum, right half; 18 – Palp; 19 – Chelicera. Scale bar 13, 16, 18: 20  $\mu$ m, scale bar 14, 15, 17, 19: 50  $\mu$ m

WEIGMANN & MURVANIDZE 2003). *Achipteria baleensis* sp. n. differs from *A. acuta* by the interlamellar setae more short (shorter than lamella in new species; longer than lamella in *A. acuta*), sensilli barbed (smooth in *A. acuta*), surface of notogaster and anogenital region foveolate (not foveolate in *A. acuta*); from *A. holomonensis* and *A. italica* by the larger body length (647-697 vs. 512-556 in *A. holomonensis*, 483-546 in *A. italica*), sensilli barbed (smooth in *A. holomonensis* and *A. italica*), surface of notogaster and



20–23. *Achipteria baleensis* sp. n.: 20 – Leg I, left, antiaxial view; 21 – Tarsus and tibia of leg II, left, antiaxial view; 22 – Femur of leg II, left, antiaxial view; 23 – Leg IV, right, antiaxial view. Scale bar 100  $\mu$ m

anogenital region foveolate (not foveolate in *A. holomonensis* and *A. italica*); from *A. longisetosus* by the larger body length (647-697 vs. 450-475 in *A. longisetosus*), tatoria long, reaching rostral border (very short, not reaching rostral border in *A. longisetosus*), surface of notogaster and anogenital region foveolate (not foveolate in *A. longisetosus*); dorsal notogastral setae shorter (seta *lm* not reaching *lp*, seta *h*<sub>3</sub> not reaching *h*<sub>2</sub> in new species; *lm* reaching *lp*, *h*<sub>3</sub> reaching *h*<sub>2</sub> in *A. longisetosus*).

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