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# Uropodina mites (Acari) collected in Costa Rica, I

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**Abstract.** In this paper six Uropodina species are presented from Costa Rica. Two of them, *Oplitis pecki* Hirschmann, 1991 and *Uroobovella faceta* Hiramatsu & Hirschmann, 1978 are already known, however the other four species; *Rotundabaloghia unisetosa*, *Trigonuropoda caudosetosa*, *Brasiluropoda costaricana* and *Cyllibula forroi* spp. nov. proved to be new to science. *Oplitis peckisimilis* Hirschmann, 1991 and *O. ellipsioides* Hirschmann, 1991 are synonymized with *O. pecki*.

Uropodina species of Neotropical soils, mosses and leaf litters have been well investigated in general. There are, however, several countries in this region which were little studied in our respect, as for instance Belize, Nicaragua, Guyana and French Guyana (Wiśniewski, 1993). Costa Rica also belongs to the less investigated countries in the Neotropical Region, only Elzinga and Rettenmeyer (1966, 1970, 1975), Hirschmann (1975) and Elzinga (1981, 1982, 1995) reported a number of *Trichocylliba* species from there. Recently, Vazquez and Klompen (2007) listed some mites from Costa Rica mentioning 15 unidentified uropodine species of the genera *Eutrachytes, Nenteria, Oplitis, Polyaspis, Uroobovella, Urodiaspis* and *Uropoda*.

János Balogh, the world-wide renowned Hungarian acarologist led several expeditions to Central and South America. He and his co-workers from the Department of Systematic Zoology and Ecology of the Eötvös Loránd University as well as from the Department of Zoology of the Hungarian Natural History Museum collected thousands of "Berlese" samples from all over the world including most of the Neotropical countries (Zicsi & Csuzdi, 2008). Recently, this material is deposited in the Soil Zoology Collections of the Hungarian Natural History Museum. My first results of the investigation of the Costa Rican materials are herewith presented.

## MATERIALS AND METHODS

The specimens were cleared in lactic acid and drawings were made with *camera lucida*. The specimens identified including the types are stored in alcohol and deposited in the Soil Zoology Collections of the Hungarian Natural History Museum, Budapest. All measurements are given in micrometers (μm).

## RESULTS

### *Uroobovella faceta* Hiramatsu & Hirschmann, 1978

(Fig. 1)

*Uroobovella faceta* Hiramatsu & Hirschmann, 1978: 74-75. Fig. 81.

*Uroobovella faceta*: Wiśniewski & Hirschmann 1993: 162., Wiśniewski 1993a: 239., Wiśniewski 1993b: 414.

*Material examined.* Four females and one male, Costa Rica, Northern part, cca. 400–500 m a.s.l., rainforest, from leaf litter and soil, 16.I. 1993; leg. J. Balogh.

*Distribution*. Ecuador and Costa Rica.

*Remarks.* Hiramatsu and Hirschmann (1978) placed it in the genus *Uroobovella* Berlese, 1903 on the basis of the gnathosomal region. In my opinion the shape of idiosoma, dorsal, marginal

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and ventral setae, and shape of the peritreme suggest that this species better belongs to a new, still undescribed genus.

This is the first record of this species from Costa Rica.

### *Oplitis pecki* Hirschmann, 1991

(Fig. 2)

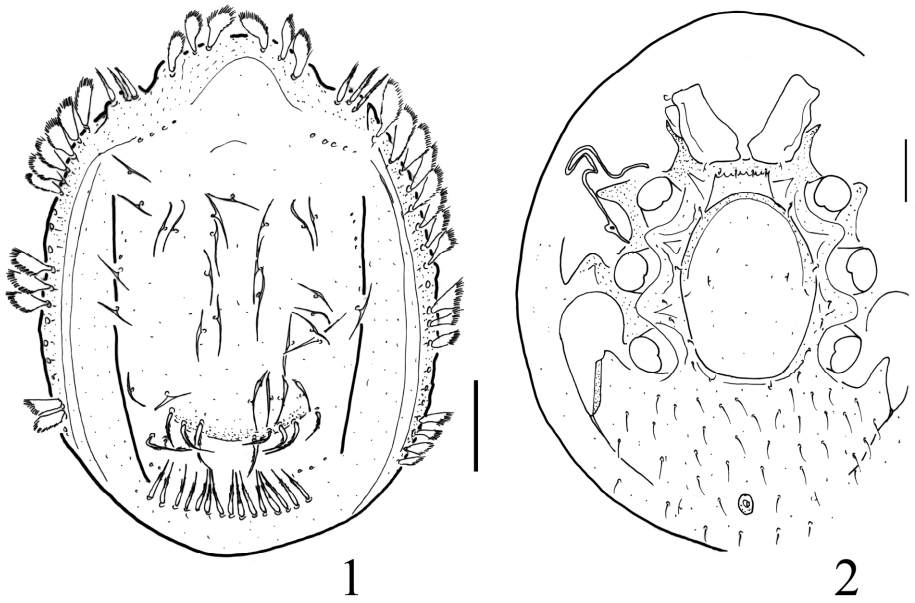
*Oplitis pecki* Hirschmann, 1991: 84. Figure in page 85.
*Oplitis pecki*: Wiśniewski & Hirschmann 1993: 61., Wiśniewski 1993a: 240., Wiśniewski 1993b: 390.
*Oplitis peckisimilis* Hirschmann, 1991: 82-84. Figure in page 83. **syn. nov.**
*Oplitis peckisimilis*: Wiśniewski & Hirschmann 1993: 61., Wiśniewski 1993a: 240., Wiśniewski 1993b: 390.
*Oplitis ellipsioides* Hirschmann, 1991: 84 and 86. Figure in page 86. **syn. nov.**
*Oplitis ellipsioides*: Wiśniewski & Hirschmann 1993: 61., Wiśniewski 1993a: 240., Wiśniewski 1993b: 389.

*Material examined.* Three females and one male, Costa Rica, Santa Cruz, Universidad de Costa Rica, cca. 150 m a.s.l., 17.I.1992; leg. J. Balogh.

*Distribution.* Galapagos Archipelago and Costa Rica.

*Remarks.* When described *Oplitis pecki, Oplitis peckisimilis* and *Oplitis ellipsioides,* Hirschmann (1991) mentioned that they differ from each other in the proportion of length and width of the genital shields. In my opinion, these differences are not enough for establishing new species, they represent merely variations among different populations within the same species.

This is the first record of this species from Costa Rica.




**Figures 1–2.** 1 = *Uroobovella faceta* Hiramatsu & Hirschmann, 1978; 2 = *Oplitis pecki* Hirschmann, 1991. (Scale bar 100 μm)

***Rotundabaloghia unisetosa* sp. nov.**

(Figs. 3–9)

*Material examined.* Holotype: female, Costa Rica, Arenal, Northern part, cca. 400–500 m a.s.l., rainforest, from moss of trees, 16.I.1993; leg. J. Balogh. Paratype: male, locality and date same as that of the holotype. Other paratypes: four females and three males, Costa Rica, Santa Cruz, Universidad de Costa Rica, cca. 150 m a.s.l. from decayed wood with soil, 17.I.1992; leg. J. Balogh.

*Diagnosis.* Sternal setae St2 and St3 long and needle-like, St1 three times and St4 two times shorter than other sternal setae. All ventral setae smooth, V2 and V7 long and wide, *ad* and V6 slightly shorter than V2 and V7. V8 absent. Sternal, genital and ventral shields without ornamentation. Genital shield of female scutiform. Dorsal setae bearing short hairs on their apical part.

*Female.* Length of idiosoma 300–310 µm, width 250–270 µm (n = 5). Shape circular, posterior margin rounded.

*Dorsal side* (Fig. 3). Marginal and dorsal shields fused. All dorsal setae bearing short hairs on their apical margins (Fig. 4). Sculptural pattern of dorsal shield absent.

*Ventral side* (Fig. 5). Sternal and ventral shields without ornamentation. Two pairs of sternal setae (St2 and St3) long and smooth, St1 three times shorter than St2 and St3. St4 two times shorter than St2 and St3. St1 placed near the anterior margin of genital shield, St2 near the anterior margin of coxae II, St3 near the central region of coxae III. St4 can be found near the anterior margin of coxae IV. All ventral setae smooth and needle-like. V2 can be seen near the basal margin of the genital shield, V7 near the metapodal line, V6 between V2 and V7. V8 absent. Setae *ad* similar to ventral setae and placed near the anal platelets. One pair of lyriform fissures can be found near the posterior margin of coxae IV. Tritosternum not clearly visible.

*Stigmata* situated between coxae II and III. Peritreme hook-shaped.

*Genital shield* scutiform, without ornamentation on its surface and without process on its apical margin.

*Gnathosoma* (Fig. 6). Corniculi horn-like, internal malae short and smooth. Hypostomal setae are as follows: h1 long, smooth and setiform, h2 two times shorter than h1, setiform and smooth, h3 1.5 times longer than h2, setiform and with serrated margins, h4 as long as h2, setiform, with serrated margins. Labrum with hairs on its apical part. Epistome narrow and apical part bears short hairs (Fig. 7). Chelicera as is shown on Fig. 8. Palp trochanter with two smooth setae, other setae of the palp smooth and simple.

*Male.* Length of idiosoma 310–320 µm, width 270–280 µm (n = 4). Shape circular, posterior margin rounded.

*Dorsal side.* Ornamentation and chaetotaxy of dorsal shield similar as for the female.

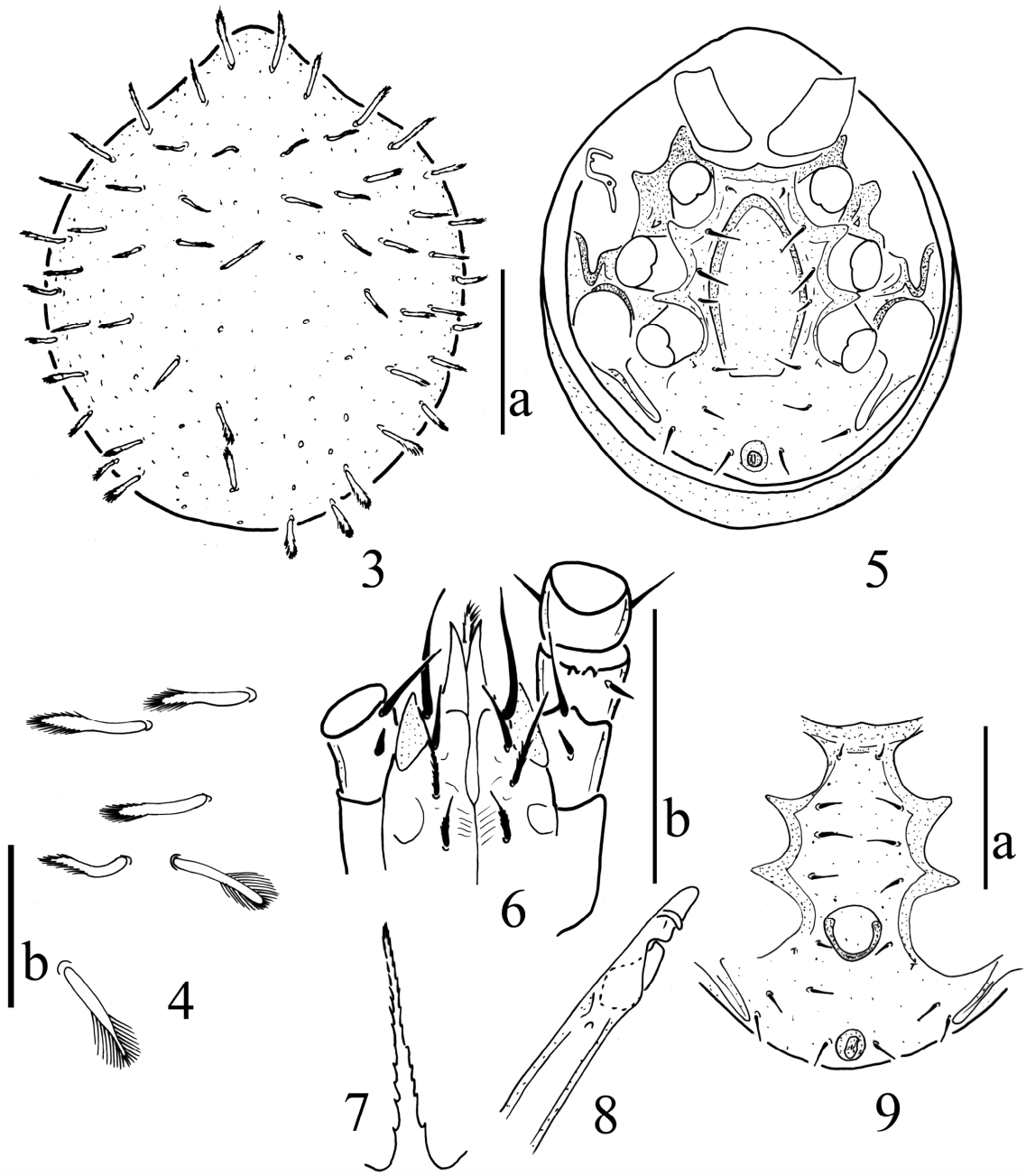
*Ventral side* (Fig. 9). Sternal and ventral shields without ornamentation. Two pairs of sternal setae (St2 and St3) long and smooth, St1 three times shorter than St2 and St3. St4 two times shorter than St2 and St3. St1 placed near the anterior margin of sternal shield, St2 near the anterior margin of coxae II, St3 near the central region of coxae III. St4 can be found near the anterior margin of coxae IV. St5 present and placed near the posterior margin of genital shield. All ventral setae smooth and needle-like. Shape and position of ventral setae same as that of the females (Fig. 14).

*Genital shield* oval and placed between coxae IV.

*Gnathosoma.* Same as in females.

*Etymology.* The specific epithet refers to the single seta in the metapodal line.

*Remarks.* Missing of setae V8 is an unusual character in the genus *Rotundabaloghia.* Recently we do not know any other species of this genus without V8 setae.




**Figures 3-9.** *Rotundabaloghia unisetosa* sp. nov. 3 = dorsal view, 4 = dorsal setae, 5 = ventral view, 6 = ventral view of gnathosoma, 7 = epistome, 8 = chelicera (female), 9 = sternal region of male. (Scale bar: a: 100 μm, b: 50 μm)

***Trigonuropoda caudosetosa* sp. nov.**

(Figs. 10–15)

*Material examined.* Holotype: female. Costa Rica, Sierra de La Muerte, El Empalme, Lower Montana Rain Forest, 2150 m a.s.l., from leaf litter, 24.I.1992; leg. J. Balogh. Paratypes: three males, locality and date same as holotype.

*Diagnosis.* All dorsal setae smooth, long and setiform, but several very long dorsal setae can be found near the anterior margin of caudal cavity. Marginal setae shorter than dorsal setae. Ornamentation lacking on dorsal and marginal shields. Scalloping can be seen between dorsal and marginal shields on the caudal region. Ventral setae similar to dorsal setae. Genital shield of female scutiform, peritreme M-shaped.

*Female.* Length of idiosoma 470 µm, width 330 µm (n = 1). Shape oval, posterior margin rounded

*Dorsal side* (Fig 10). Dorsal and marginal shields fused on the anterior region. All dorsal setae long, smooth and setiform. Posterior region of dorsal shield with a cavity, which has a well sclerotised posterior margin. Dorsal setae on anterior margin of dorsal cavity 1.5 times longer than other dorsal setae (Fig. 12). Marginal setae smooth, setiform and three times shorter than dorsal setae (Fig. 11). Dorsal and marginal shields without ornamentation.

*Ventral side* (Figs 2 and 13). Sternal and ventral shields without sculptural pattern, all sternal setae short, smooth and needle-like. St1 placed near the anterior margin of genital shield, St2 near central region of coxae II, St3 near central region of coxae III. St5 can be found at the basal part of genital shield. Ventral setae four times longer than sternal setae, all sternal setae smooth, and setiform. Ventral setae situated in four rows: first row can be found on the level of posterior margin of coxae IV, second row on central region of metapodal line, third on the level of anal platelets and fourth on level of postanal setae. Ornamentation of ventral shield lacking. Tritosternum with narrow basis and trifurcated laciniae (Fig. 14).

*Stigmata* situated between coxae II and III. Peritreme long, M-shaped.

*Genital shield* scutiform, without patterns and process. Genital shield localized between coxae II and IV.

*Gnathosoma* (Fig 14). Corniculi horn-like, internal malae short and smooth. The ventral part of gnathosoma with the following hypostomal setae: h1 smooth and long, h2 setae five times shorter than h1 and smooth, h3 smooth and two times shorter than h1, h4 smooth and trifurcated. Labrum with short hairs. Epistome with serrated margin on its basal part, and with short hairs on its apical part. Chelicera not clearly visible.

*Male.* Length of idiosoma 460–470 µm, width 310–340 µm (n = 3). Shape oval, posterior margin rounded. Dorsal side similar to that of the female.

*Ventral side* (Fig 15): Sternal shield without ornamentation. Sternal setae smooth, short and needle-like. Ventral setae similar to that of the female.

*Genital shield* of male circular and situated between coxae IV.

*Gnathosoma.* Same as in females.

*Nymphs* and larva are unknown.

*Etymology.* The specific epithet refers to the long caudal setae.

*Remarks.* The presence of the dorsal cavity and the shape and length of the dorsal setae is unique in the genus *Trigonuropoda*.

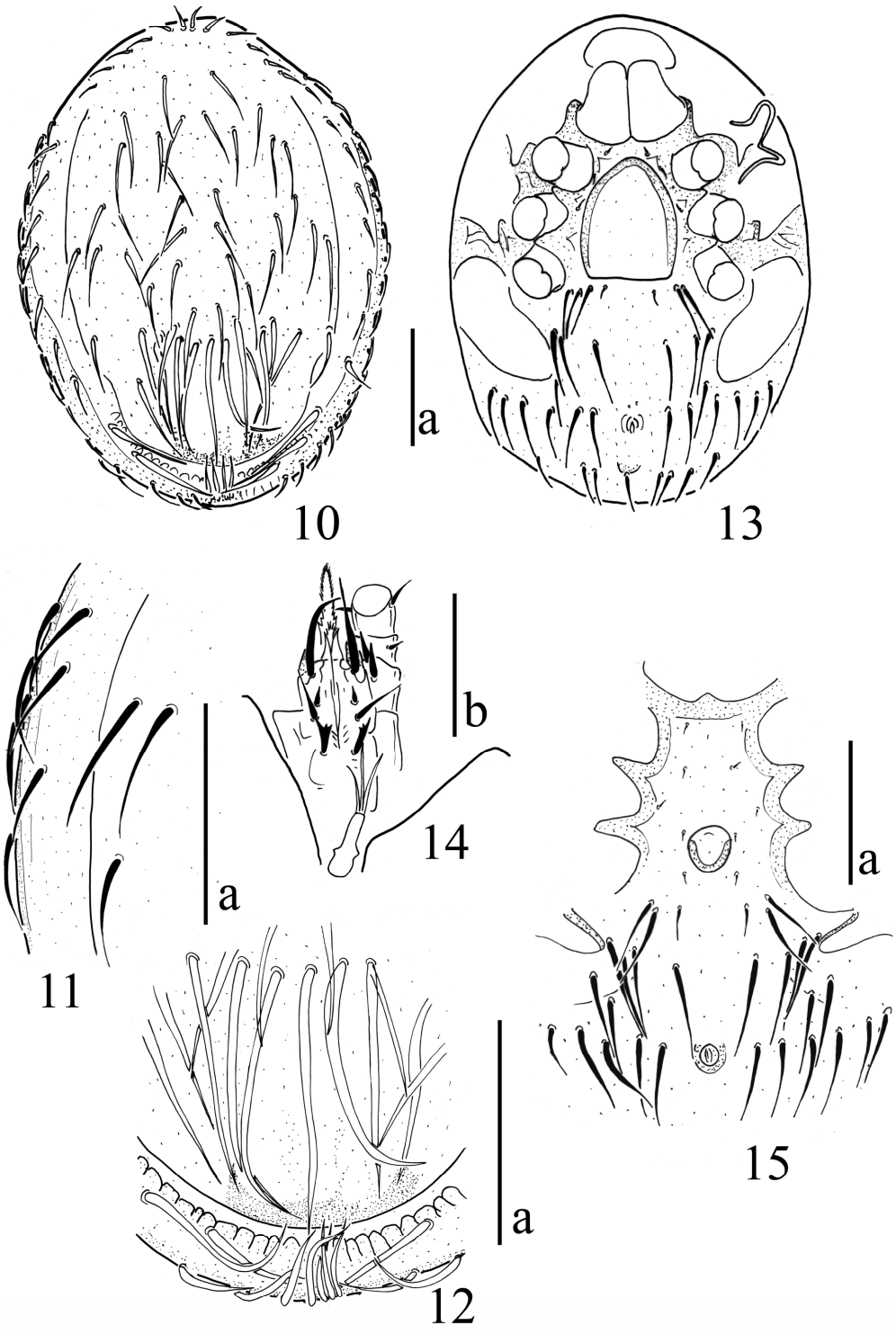
### ***Brasiluropoda costaricana* sp. nov.**

(Figs. 16–22)

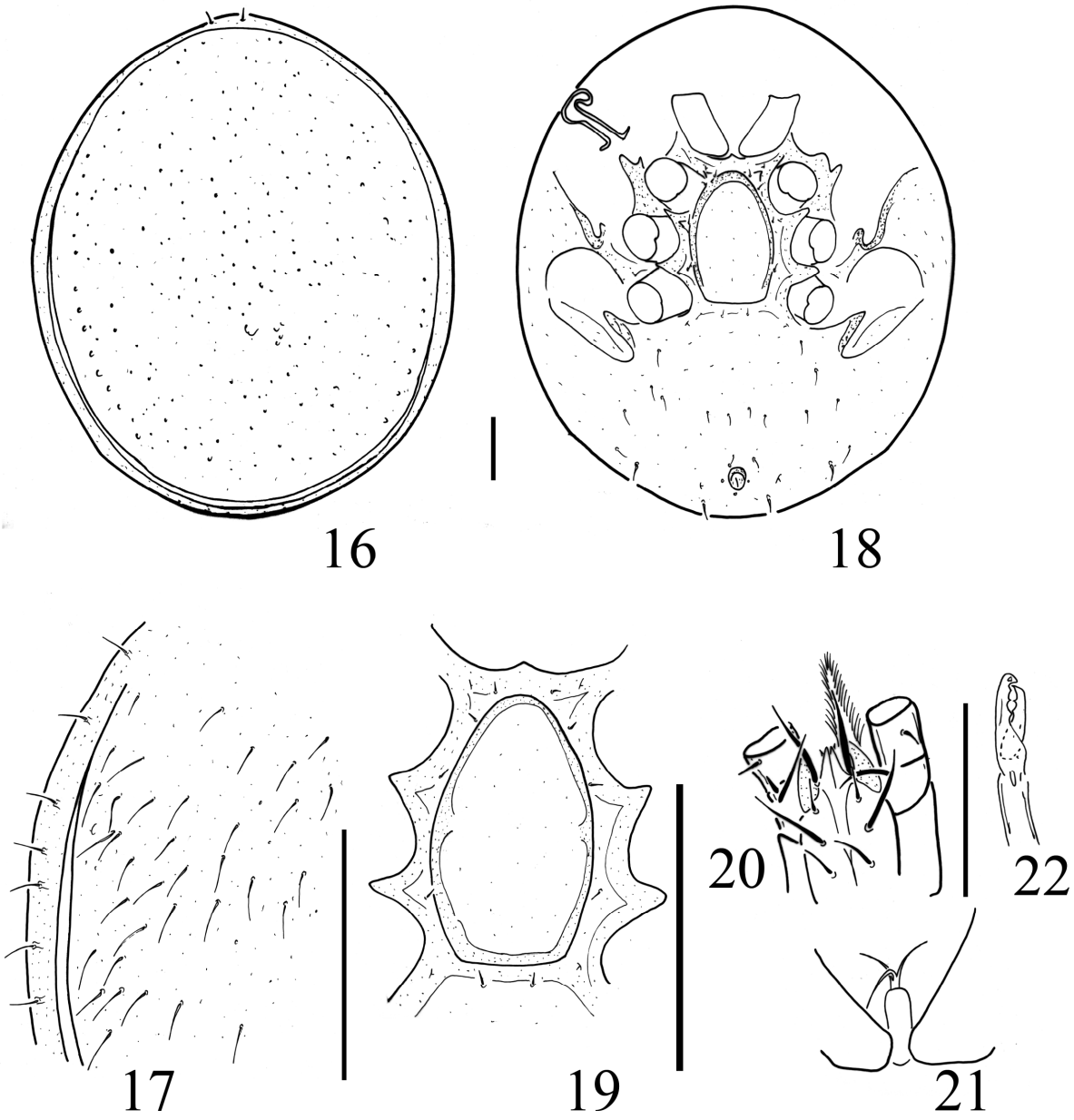
*Material examined.* Holotype: female: Costa Rica, Sierra de La Muerte, Cerro La Muerty, 3400 m a.s.l., Montana Rain Forest, from mixed moss, 24.I.1992; leg. J. Balogh. Paratypes: two females, locality and date same as in holotype.

*Diagnosis.* All dorsal and marginal setae smooth, narrow and needle-like. Sternal setae short, smooth and needle-like, ventral setae two times longer than sternal setae. Eight ventral setae can be found in a row between the anal platelets and the metapodal lines. Peritreme asymmetric, mushroom-shaped.

*Female.* Length of idiosoma 780–800 µm, width 670–690 µm (n = 3). Shape oval, posterior margin rounded. *Dorsal side* (Fig. 16). Dorsal and marginal shields separated. Ornamentation on dor-




**Figures 10–15.** *Trigonuropoda caudosetosa* sp. nov. 10 = dorsal view, 11 = marginal setae, 12 = caudal setae 13 = ventral view, 14 = ventral view of gnathosoma (female), 15 = sternal region of male. (Scale bar: a: 100 μm, b: 50 μm)




**Figures 16–22.** *Brasiluropoda costaricana* sp. nov. 16 = dorsal view, 17 = marginal- and dorsal setae, 18 = ventral view, 19 = genital shield of female, 20 = ventral view of gnathosoma, 21 = tritosternum, 22 = chelicera. (Scale bar 100 μm)

sal and marginal shields lacking. All dorsal and marginal setae smooth, narrow and needle-like (Fig. 17).

*Ventral side* (Fig. 18). Sternal and ventral shields without sculptural pattern, all sternal setae short, smooth and needle-like (Fig. 19). St1 placed near the anterior margin of genital shield, St2 near anterior region of coxae II, St3 near posterior region of coxae III, St4 near anterior margin of coxae IV. St5 can be found at the basal part of genital shield. One pair of lyriform fissure can be found near St1, an other pair placed near

St5. Ventral setae two times longer than sternal setae, all ventral setae smooth, and needle-like. Eight ventral setae placed in a row between anal platelets and metapodal lines. Tritosternum with narrow basis and trifurcated laciniae. (Fig. 21).

*Stigmata* situated between coxae II and III. Peritreme long, asymmetric mushroom-shaped.

*Genital shield* scutiform, without patterns and process. Genital shield localized between coxae II and IV.

*Gnathosoma* (Fig. 20). Corniculi horn-like, internal malae short and smooth. The ventral part of gnathosoma with the following hypostomal setae: h1 smooth and long, h2 setae three times shorter than h1 and smooth, h3 smooth and as long as h1, h4 smooth and as long as h2. Epistome with short hairs on its apical part. Chelicera is shown in Fig. 22.

*Nymphs* and larva are unknown.

*Etymology.* This species is named after the country where it was collected.

*Remarks.* The new species with its asymmetric mushroom-shaped peritreme belongs to the *mahunkai* species group.

### Key to the species of the *mahunkai* group

1 Ornamentation on sternal and ventral shields present .....
..... ***B. eustructura*** Hirschmann & Zirngiebl-Nicol, 1975
– Ornamentation on sternal and ventral shields absent.....2
2 Ventral setae short.....3
– Ventral setae very long.....
..... ***B. loksai*** Zirngiebl-Nicol & Hirschmann, 1975
3 Eight ventral setae arranged in a row.....
.....***B. costaricana*** sp.nov.
– Ventral setae not not arranged in a row.....
..... ***B. mahunkai*** Zirngiebl-Nicol & Hirschmann, 1975

### *Cyllibula forroi* sp. nov.

(Figs. 23–28)

*Material examined.* Holotype: female: Costa Rica, Arenal, Northern part, cca. 400-500 m a.s.l., rainforest, from leaf litter and soil, 16.I.1993. leg. J. Balogh. Paratypes: one female and two males, locality and date same as holotype.

*Diagnosis.* All dorsal and marginal setae needle-like and bear short hairs on their margins. Sternal and ventral setae short, smooth and needle-like. Several long (two times longer than other ventral setae) smooth and setiform setae can be seen near the margin of ventral shield. Peritreme S-shaped.

*Female.* Length of idiosoma 610–620 μm, width 540–550 μm (n=2). Shape oval, posterior margin rounded.

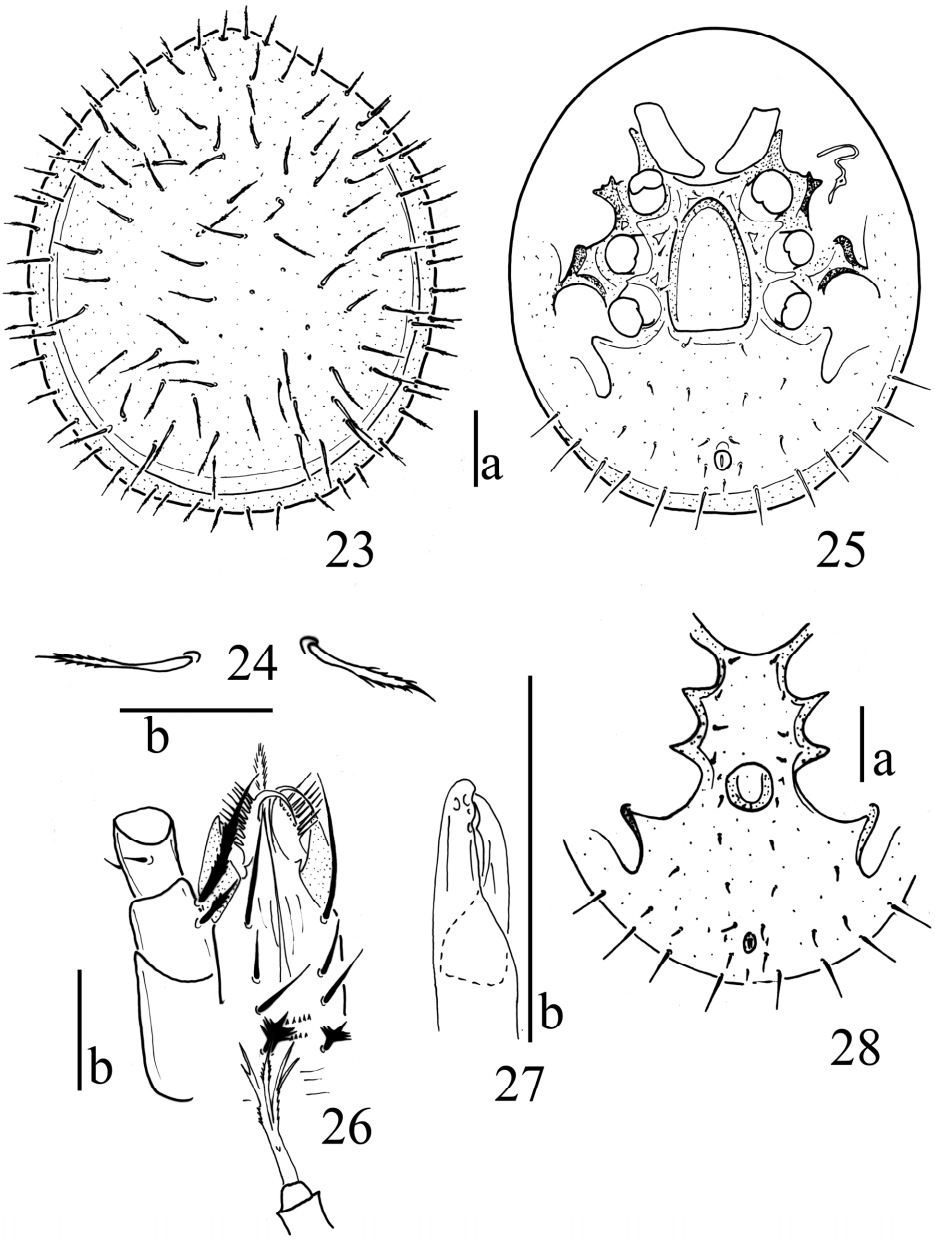
*Dorsal side* (Fig. 23). Dorsal and marginal shields fused on the anterior region. Ornamentation on dorsal and marginal shields lacking. All dorsal and marginal setae needle-like and bear short hairs on their margins (Fig. 24).

*Ventral side* (Fig. 25). Sternal and ventral shields without sculptural pattern, all sternal setae short, smooth and needle-like. St1 placed near the anterior margin of genital shield, St2 near posterior margin of coxae II, St3 near central region of coxae III, St4 near central region of coxae IV. St5 can be found at the basal part of genital shield. Ventral setae smooth, needle-like and as long as sternal setae. Several longer setae can be found near the caudal margins of ventral shield. One pair of lyriform fissures can be seen near the anal platelets. Tritosternum with narrow basis and trifurcated laciniae provided with serrated margin (Fig. 26).

*Stigmata* situated between coxae II and III. Peritreme S-shaped.

*Genital shield* scutiform, without patterns and process. Genital shield localized between coxae II and IV.

*Gnathosoma* (Fig. 20). Corniculi horn-like, internal malae long and with several branches on the margin. The ventral part of gnathosoma with the following hypostomal setae: h1 smooth and long, h2 setae three times shorter than h1 and smooth, h3 smooth and as long as h2, h4 short and antler-shaped. Epistome with short hairs on its apical part. Chelicera is shown in Fig. 27.




**Figures 23–28.** *Cyllibula forroi* sp. nov. 23 = dorsal view, 24 = dorsal setae, 25 = ventral view, 26 = ventral view of gnathosoma and tritosternum, 27 = chelicera (female), 28 = sternal region of male. (Scale bar a: 100 μm, b: 50 μm)

*Male.* Length of idiosoma 620–630 μm, width 510–540 μm (n=2). Shape oval, posterior margin rounded. Dorsal side similar to that of the female.*Ventral side* (Fig 28): Sternal shield without ornamentation. Sternal setae smooth, short and needle-like, one pair of lyriform fissures can be found near the genital shield. Ventral setae similar to female. Genital shield of male circular and situated between coxae IV. *Gnathosoma.* Same as in the females.

*Nymphs* and larva are unknown.

*Etymology*. I dedicate this new species to Dr. László Forró, Crustacean specialist, head of the Department of Zoology of the Hungarian Natural History Museum.

*Remarks.* The new species with its S-shaped peritreme belongs to the *kaszabi* species group. The dorsal setae with short hairs and the antler-shaped h4 setae are unique for this species in the *kaszabi* group.

## ZOOGEOGRAPHICAL NOTES

Six Uropodina species are listed in the present work from Costa Rica. One of the already known species, *Uroobovella faceta* Hiramatsu & Hirschmann, 1978 was originally described from Ecuador (Hiramatsu & Hirschmann, 1978, Wiśniewski 1993a). I suppose that this species has a wider distribution in Central and South America.

The other known species *Oplitis pecki* was described from the Galapagos Island, however the genus *Oplitis* is a world-wide distributed genus, and urgently need to be revised.

One of new species (*Brasiluropoda costaricana*) is the 15th species of the neotropical genus *Brasiluropoda* Hirschmann & Zirngiebl-Nicol, 1964. The members of this genus occur only in Brasilia, Paraguay and Peru (Wiśniewski 1993a). This is the first record of the genus from Central America.

The *Cyllibula* Berlese, 1916 species are widely distributed in the Neotropical region (Brasilia, Cuba and other Caribbean Islands, Mexico, Bolivia, Peru, Paraguay, Chile and Venezuela (Wiśniewski 1993a, Kontschán 2007), in Polynesia, Malaysia, West-Africa and Europe (Wiśniewski 1993a). This is the first record of the genus from Costa-Rica.

The circum-tropical and species-rich genus *Rotundabaloghia* has not been recorded from Costa Rica so far; the species of this genus occur in every tropical regions of the world. Recently more than 60 species are described from Central- and South-America (Kontschán 2007, 2008a), so the occurrence of the genus in Costa, Rica is not surprising.

*Trigonuropoda caudosetosa* sp. nov. belongs to the monotypic circumtropical family Trigonuropodidae, There are only two species recorded for continental South America so far (Peru; Wiśniewski 1993a) and 12 species are known from the Caribbean Islands (Cuba and Dominican Republic; Kontschán, 2008 b).

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