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A new genus and four new species of mites from Argentina, Brazil and Nicaragua (Acari: Prostigmata: Erythraeidae, Eutrombidiidae)

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ABSTRACT. *Fozustium paranensis* n. gen., n. sp. from Brazil, *Balaustium brunoni* n. sp. (Erythraeidae), *Eutrombidium fortunatae* n. sp. both from Argentina and *E. carazoense* n. sp. from Nicaragua (Eutrombidiidae), all from larval instar are described.

Key words: acarology, taxonomy, Erythraeidae, Eutrombidiidae, *Fozustium*, *Balaustium*, *Eutrombidium*, new genus, new species, Argentina, Brazil, Nicaragua.

INTRODUCTION

In South, Central and North America in the subfamily Balaustiinae (Erythraeidae) only five species based on larvae were known hitherto: *Balaustium kendalii* WELBOURN from USA, *B. putmani* SMILEY from Canada, *B. medardi* HAITLINGER from Peru, *B. soydani* HAITLINGER from Guatemala and *B. minodorae* HAITLINGER from Mexico. Moreover, *B. obtusum* TRÄGÅRDH from Juan Fernandez Isl. based on adults was noted (TRÄGÅRDH 1931, SMILEY 1968, WELBOURN & JENNINGS 1991, HAITLINGER 2000a, b). In this paper new species of *Balaustium* and *Fozustium* n. gen., n. sp. are described.

In the family Eutrombidiidae from South, Central and North America only three species, based on larvae, were known hitherto: *Eutrombidium orientale* SOUTHCOTT from Canada and USA, *E. occidentale* SOUTHCOTT, *E. centrale* SOUTHCOTT and *Verdunella lockleii* (WELBOURN & YOUNG) all from USA (WELBOURN & YOUNG 1988, SOUTHCOTT 1993). In this paper two new species from Argentina and Nicaragua are described.

MATERIAL AND METHODS

Balaustiniid mites were obtained from herbaceous plants. *Fozaustium paranensis* n. gen., n. sp. was obtained in the vicinity of Foz do Iguacu (Brazil) in April 2003 and *Balaustium brunoni* n. sp. was obtained in Buenos Aires (Argentina) in March 2003. Eutrombidiid mites were obtained: *Eutrombidium carazoense* n. sp. in La Boquita n. Carazo (Nicaragua) in February 1998 from undetermined Gryllidae (Orthoptera) and *E. fortunatae* n. sp. in Bariloche (Argentina) in March 2003 from undetermined Apidae. All specimens were preserved in ethanol and mounted later in Berlese's medium. Holotypes of the new species are deposited in the Museum of Natural History, Wrocław University (MNHWU), Poland.

Measurements below are expressed in micrometers (μm). Abbreviations used in the text are explained in SOUTHCOTT (1993) and HAITLINGER (2000 b, 2003).

Erythraeidae ROBINEAU-DESVOIDY, 1828
Balaustiinae GRANDJEAN, 1947
Balaustium VON HEYDEN, 1826

Balaustium brunoni n. sp.

ETYMOLOGY

The name has been derived from the name Brunon.

DIAGNOSIS

Bf 4-4-3, Tr 3-3-2, Ti 13-11-11, number of dorsal setae ~77, ISD 46-58, AL 22, TaI 60, TiI 68-74.

DESCRIPTION

Larva. Dorsum of idiosoma with ~77 slightly barbed setae, eyes present (fig. 1). Dorsal scutum with AL /ML<PL, all barbed. AM and S barbed distally (fig 3).

Ventral surface of idiosoma with sternalae 1a and 2a, ~21 setae between coxae II-III and behind coxae III 36 setae, all nude excluding posterior setae of opisthosoma. Coxalae I-III ?nude (fig. 2). NDV = ~113.

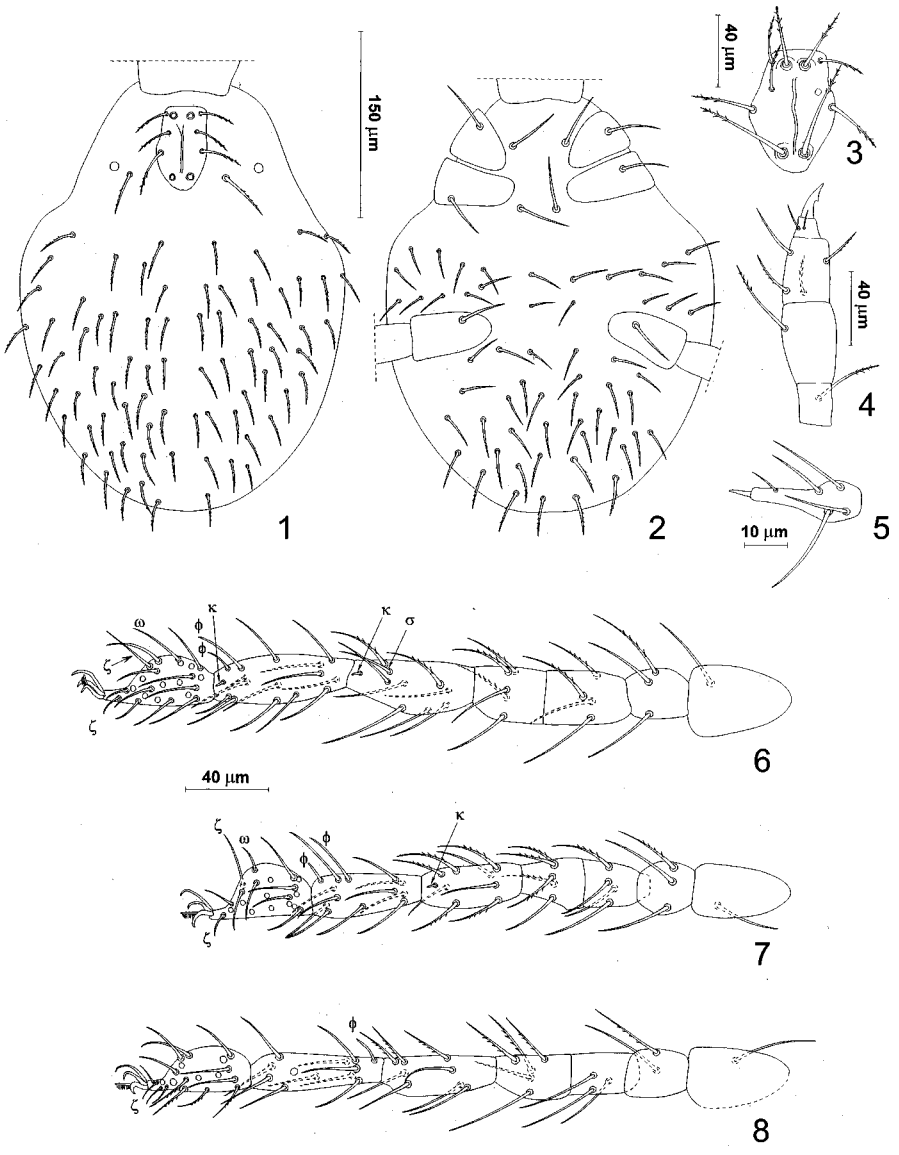
Gnathosoma relatively short, deformed. Hypostomalae invisible, galealae present. Palptrochanter and palpfemur, each with one barbed seta. Palpgenu with 4 setae, one is nude. Palptibia with 2 nude setae (fig. 4). Palptarsus with 6 nude setae (with solenidion and eupathidium) (fig. 5). Palpal setal formula B-B-BBBN-NN-ζωNNNN.

Leg lengths (with coxa, without claws) I 358 holotype, 394 paratype; II 334, 308; III 372, 352. IP = 1064, 1054.

Setal formula. Leg I. Ta 1ω, 2ζ, 19, Ti 2ϕ, 1κ, 13, Ge 1σ, 1κ, 8, Tf 5, Bf 4, Tr 3, Cx 1 (fig. 6).

Leg II. Ta 1ω, 2ζ, 17, Ti 2ϕ, 11, Ge 1κ, 8; Tf 5; Bf 4; Tr 3; Cx 1 (fig. 7).

Leg III. Ta 1ζ, 19; Ti 1ϕ, 11; Ge 8; Tf 5; Bf 3; Tr 2; Cx 1 (fig. 8).



1-8. *Balaustium brunoni*: 1 - idiosoma, dorsal view, 2 - idiosoma, ventral view, 3 - scutum (paratype), 4 - palp, 5 - palptarsus, 6 - leg I, tarsus-coxa, 7 - leg II, tarsus-coxa, 8 - leg III, tarsus-coxa

Metric data are given in Table 1.

Table 1. Metric data for *Fozustium paranensis* n. gen. and n. sp., and *Balaustium brunoni* n. sp.

	F. paranensis	*B. brunoni*			*F. paranensis*	*B. brunoni*	
	H	H	P		H	H	P
IL	425	336	356	TaI	64	60	60
IW	292	266	254	TiI	78	68	74
AW	38	28	34	GeI	76	64	68
MW		26	28	TfI	34	40	40
PW	40	36	44	BfI	52	42	42
AL	46	22	22	TrI	36	32	36
ML		28	26	CxI	62	52	74
PL	74	36	32	TaII	56	54	48
AM	50	-	36	TiII	72	56	58
S	54	-	56	GeII	62	52	52
AA	14	12	10	TfII	28	38	30
SB	12	12	10	BfII	40	36	24
ISD	40	58	46	TrII	40	36	40
AP	26	26	24	CxII	56	62	56
DS	36-94	30-44	28-36	TaIII	62	58	52
GL	74	104	94	TiIII	88	74	70
1a	50	42	42	GeIII	70	60	60
Pfd	42	-	-	TfIII	36	40	38
Pfv	46	-	-	BfIII	46	40	40
1b*	54	44	48	TrIII	44	36	32
1b**	50	-	40	CxIII	52	64	60
2b	42	42	40	Ip	1154	1064	1054
3b	56	40	40				
sc1	36	-	-				

Abbreviations: 1b* proximal seta, 1b** distal seta.

TYPES

Holotype: ARGENTINA, 7 III 2003, from herbaceous plants; leg. R. HAITLINGER (preserved in the Museum of Natural History, Wrocław University). Holotype deposited in MNHWU; one paratype: same data as holotype, preserved in author's collection.

REMARKS

The following species recognized as larvae have been described in the genus *Balaustium* VON HEYDEN, so far: *B. zhangi* SABOORI from Iran, *B. florale* GRANDJEAN from Corsica and Mallorca, *B. kacperi* HAITLINGER, *B. wratislaviensis* HAITLINGER, *B. rajmundi* HAITLINGER, all from Poland, *B. nikae* HAITLINGER from Poland, Slovakia and the Czech Republic, *B. cristatum* MEYER & RYKE from Republic of South Africa, *B. medardi* HaitLinger from Peru, *B. soydani* HAITLINGER from Guatemala, *B. minadorae* HAITLINGER from Mexico, *B. putmani* SMILEY from Canada and *B. kendalli* WELBOURN from USA (GRANDJEAN 1947, MEYER & RYKE 1959, SMILEY 1968, WELBOURN & JENNINGS 1991, HAITLINGER 1996, 2000b, 2002, 2003, SABOORI 2001). *B. brunoni* n. sp. is especially similar to *B. soydani*. It

differs in Ti setae formula 13-11-11 vs 11-11-10, GeI with 1σ, 1κ, 8 vs 1σ, 9, TiII with 2ϕ vs 1ϕ, 1κ, GeII with κ, shorter IP (1054-1064 vs 1112) and 1a (42 vs 54); from *B. minodorae* in shorter AL (22 vs 28-32), PL (32-36 vs 46-48), AM (36 vs 48-54), GL (94-104 - 110-118), fD (77 vs 88) and fV (36 vs 62); from *B. medardi* in shorter AW (28-34 vs 36-42), AL (22 vs 32-46), PL (32-36 vs 42-52), GL (94-104 vs 122-130), ISD (46-58 vs 64-74), TaI (60 vs 70-80) and TiI (68-74 vs 80-102); from *B. kacperi* in shorter AW (28-34 vs 50), PW (36-44 vs 62), AL (22 vs 40), PL (32-36 vs 44), ISD (46-58 vs 80), GL (94-104 vs 136) and TaI (60 vs 86); from *B. rajmundi* in shorter AW (28-34 vs 54), ISD (46-58 vs 64) and the presence of scutum; from *B. nikae* in longer PL (32-36 vs 24-30), TiI (68-74 vs 56-66), fD (77 vs 53) and GeI with 2ϕ; from *B. wratislaviensis* in shorter AP (24-26 vs 38-40), GL (94-104 vs 108-120), TiI (68-74 vs 78-86), fV (36 vs 56); from *B. zhangi* in shorter PW (36-44 vs 56-63), AP (24-26 vs 33-37), longer PL (32-36 vs 27-31), formula of Bf (4-4-3 vs 4-4-2) and formula of Tr (3-3-3 vs 3-3-2); from *B. florale* in shorter MW (26-28 vs 36-44), PW (36-44 vs 66-84), longer ML (26-28 vs 16-20), PL (32-36 vs 20-24), GL (94-104 vs 74-92) and TiI (68-74 vs 54-62); from *B. kendalli* in shorter AM (36 vs 45-53), AL (22 vs 26-32), AW (28-34 vs 37-42), ISD (46-58 vs 57-66) and leg III (352-372 vs 381-425).

Fozustium n. gen.

DIAGNOSIS

fnCx 2-2-2, fnTr 2-2-2, pedotarsalae 3-3-3 without pulviliform rod, palp with 3 palpfemoralae, 2 palpgenualae and 2 palptibialae, palp claw divergent, lack of scutum, setae ML and 1a. Gender: masculine.

Type species: *Fozustium paranensis* n. sp.

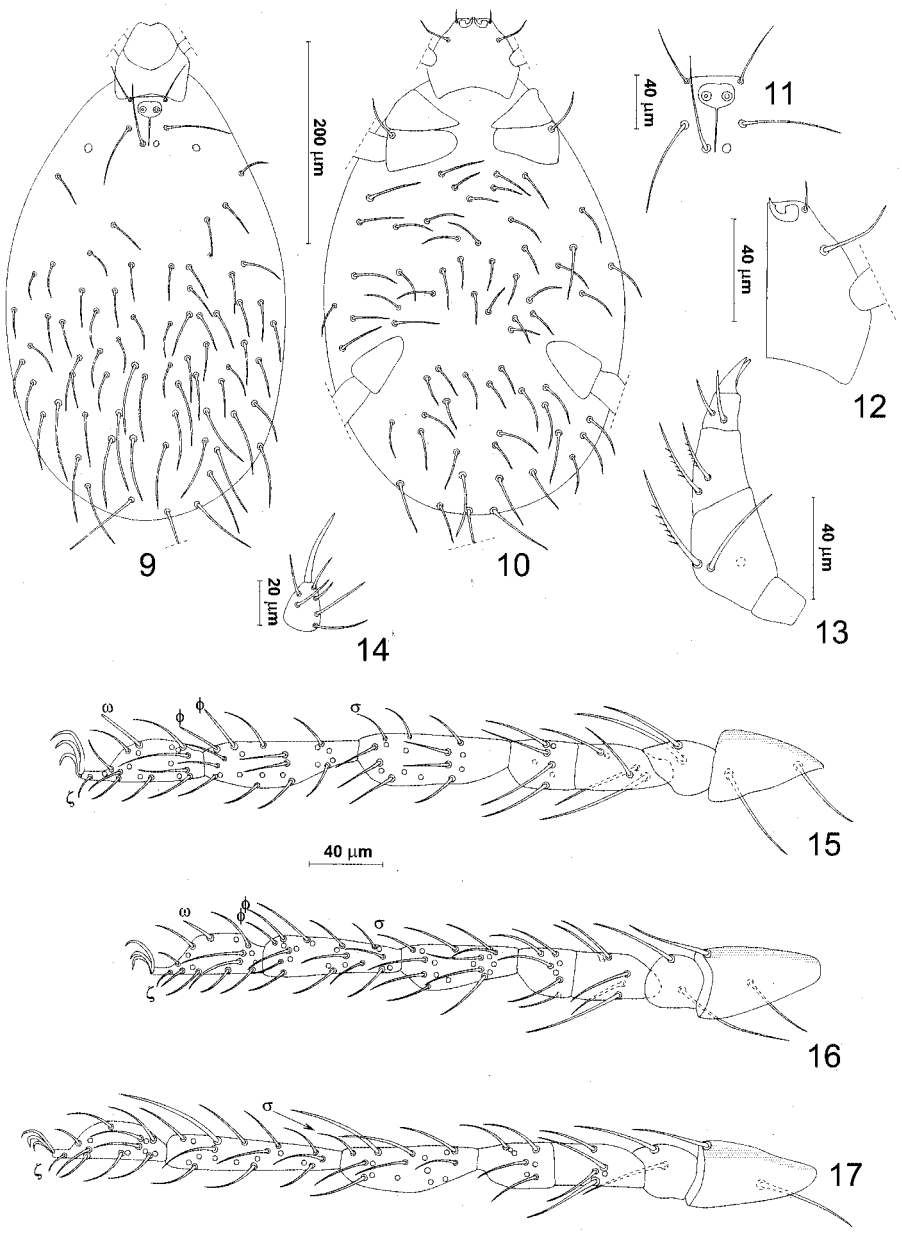
REMARKS

In the subfamily Balaustiinae 7 genera were known: *Balaustium* VON HEYDEN, 1826, *Myopongia* SOUTHCOTT, 1961, *Pollux* SOUTHCOTT, 1961, *Bursaustium* HAITLINGER, 2000, *Palenqustium* HAITLINGER, 2000, *Guatustium* HAITLINGER, 2000 and *Italustium* HAITLINGER, 2000 (SOUTHCOTT 1961, HAITLINGER 2000a, b). The new genus *Fozustium* differs from all these genera in fnCx 2-2-2, 3 palpfemoralae (excluding *Pollux*), bifurcate palp claw and fnTr 2-2-2 (excluding *Italustium*). Moreover, from *Pollux* it differs in 2 palpgenualae (vs 5) and 2 tibialae (vs 3).

Fozustium paranensis n. sp.

ETYMOLOGY

Named after the type locality, State of Parana.



9-17. *Fozustium paranensis*: 9 - idiosoma and gnathosoma, dorsal view, 10 - idiosoma and gnathosoma, ventral view, 11 - setae in scutal area, 12 - fragment of gnathosoma, ventral view, 13 - palp, 14 - palptarsus, 15 - leg I, tarsus-coxa, 16 - leg II, tarsus-coxa, 17 - leg III, tarsus-coxa

DIAGNOSIS

With the features mentioned in the diagnosis for the genus and DS 36-94, PL 74, TaI 64, TiIII 88.

DESCRIPTION

Larva. Idiosoma longer than wide with ~68 nude setae, excluding the longest posterior setae that are weakly barbed. Eyes present (fig. 9). Scutum lacking, AL<PL, all nude, lacking setae ML. Sensillae S long, nude (AM damaged). At bases of setae AM surrounding line (fig. 11).

Idiosoma ventrally without setae 1a, between coxae II and III ~37 setae, beyond coxae III ~26 posteriorly long setae, all nude. Coxae I -III, each with two nude setae, subequal in length (fig. 10).

Gnathosoma short with nude hypostomalae and nude galealae (fig. 12). Palp with 3 palpfemoralae (one barbed), 2 palpgenualae (one barbed) and 2 nude palptibialae (fig. 13). Palptarsus with seven setae (with solenidion and ζ) (fig. 14). Palpal setal formula fPp O-2N, 1B-1N,1B-2N-7N. Palpal tibial claws bifurcate without median tooth (fig. 13).

Leg setal formula. Leg I. Ta 1ω, 1ζ, 17, Ti 2ϕ, 19, Ge 1σ, 15, Tf 7, Bf 5, Tr 2, Cx 2 (fig. 15).

Leg II. Ta 1ω, 1ζ, 15, Ti 2ϕ, 20, Ge 1σ, 15, Tf 7, Bf 5, Tr 2, Cx 1 (fig. 16).

Leg III. Ta 16, Ti 19, Ge 1σ, 15, Tf 7, Bf 5, Tr 2, Cx 1 (fig. 17).

Leg lengths (with coxa, without claws) I 402, II 354, III 398. Ip = 1154.

Metric data are given in Table 1.

TYPES

Holotype: BRAZIL, vicinity of Foz do Iguacu, 8 III 2003, from herbaceous plants; leg R. HAITLINGER (preserved in MNHWU).

Eutrombidiidae THOR, 1935
Eutrombidium VERDUN, 1909

Eutrombidium fortunatae n. sp.

ETYMOLOGY

The name of the species has been derived from the name Fortunata.

DIAGNOSIS

Lateral pygosomal seta (LPS) 80, AW 108, AW/AA 1.80, SA/SP 1.45, HS/PLN 4.75.

DESCRIPTION

Larva. Idiosoma elongate; dorsum with 17 ?nude setae. Eyes placed far from scutum (fig. 18). Scutum punctate with rounded anterior border and slightly

concave posterior border. Scutalae AL longer than PL, AM and S thin, all these setae bare (fig. 20). Scutellum oval, punctate with two bare setae placed at its anterior margin (fig. 21).

Ventral surface of idiosoma with two setae 3a, beyond coxae III with 12 nude setae. Anus placed in medial part of opisthosoma. Distal coxala I and coxalae II-III, each with divergent distal part. Proximal coxala I thin and nude (fig. 19).

Gnathosoma hardly visible; conical hypostomalae, sclerotised oral „ring" present; palptarsus has long and thin seta (the other setae invisible).

Leg lengths (with coxa, without claws). I 278, II damaged, III 254.

Leg setal formula. Leg I. Ta 1ω, 1ζ, 17; Ti 2φ, 6; Ge 2σ, 4; Fe 6; Tr 1 (fig. 22).

Leg II damaged. Leg III. Ta 10; Ti 4; Ge 1σ, 2; Fe 4; Tr 1 (fig. 23). Tarsus III with bare roxala 26 μm long, dumala bears 3 long setules and two short setules, cultanala with short setules.

Metric data are given in Table 2.

Table 2. Metric data for *Eutrombidium fortunatae* n. sp. and *E. carazoense* n. sp.

	E. fortunatae	*E. carazoensis*			*E. fortunatae*	*E. carazoensis*	
		H	P			H	P
IL	1324	1206	330-1125	LPS	80	68	62-66
IW	793	674	241-1116	HS	76	64	62-66
L	116	136	112	LSS	134	94	104-116
W	140	126	106-122	SS	50	36	32-42
AW	108	70	70-80	SL	36	48	40-44
PW	130	120	104-120	PLN	16	8	8
AL	48	46	38-44	TaI	74	62	64-68
PL	30	26	26-28	TiI	38	32	30-34
AM	38	-	20	GeI	26	22	22-24
S	84	~54	72	FeI	52	44	44-48
ASB	94	110	96	TrI	30	24	24-30
MA	42	50	42	CxI	58	64	54-60
SA	32	46	46-48	TaII	-	54	56-60
SP	22	14	14-16	TiII	-	34	26-30
AA	60	40	42	GeII	-	16	16-20
SB	94	92	90-92	FeII	-	44	44-46
GL	92	60	64-72	TrII	-	26	24-32
3a	30	34	36-42	CxII	-	62	50-56
1b*	26	24	22-24	TaIII	52	50	50-52
1b**	12	20	18-20	TiIII	40	32	32-36
sc1	12	-	14	GeIII	18	16	18
				FeIII	54	44	42-48
				TrIII	34	32	26-32
				CxIII	56	54	50-54

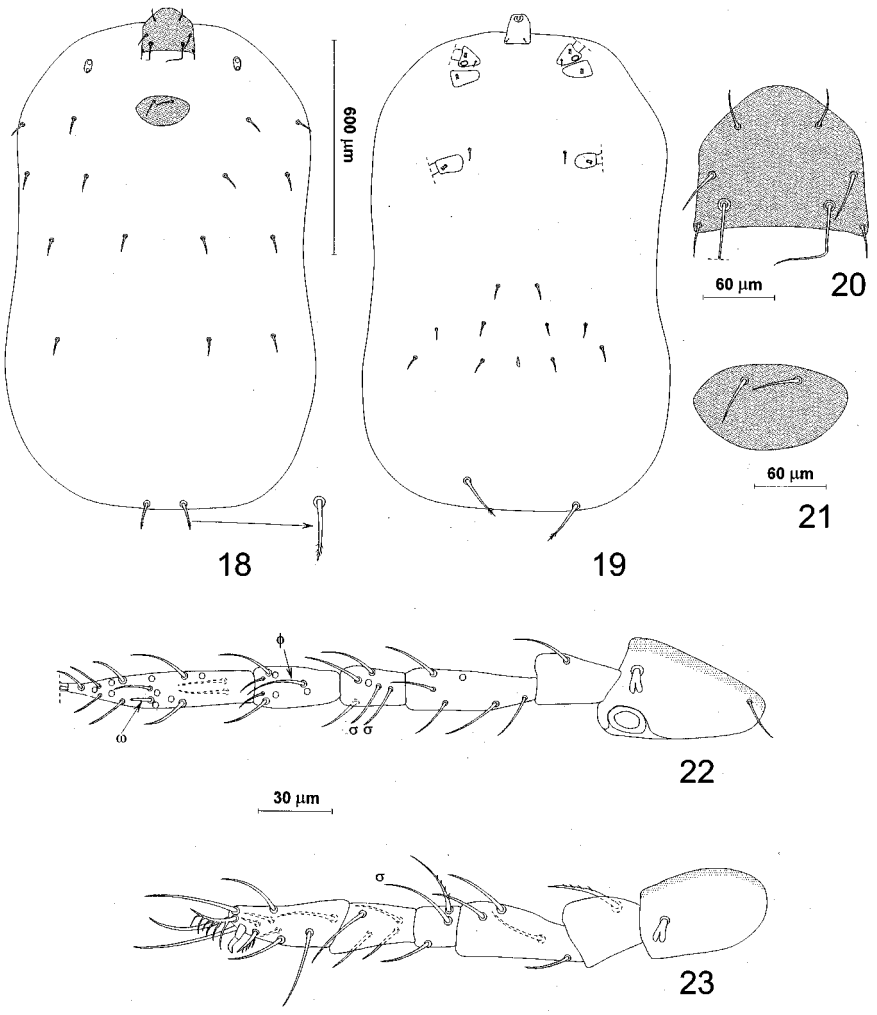
Abbreviations: 1b* proximal seta, 1b** distal seta.

TYPES

Holotype: ARGENTINA, Bariloche, 21 II 2003, from undetermined Apidae; leg. R. HAITLINGER (preserved in MNHWU).

REMARKS

E. fortunatae n. sp. belongs to the species group without deeply cleft coxalae with uneuqal lobes. To this group belong *E. feldmanmuhsamae* FEIDER, *E. orientale* SOUTHCOTT, *E. africanum* SOUTHCOTT, *E. trigonum* (HERMANN), *E. indicum* SOUTHCOTT, *E. occidentale* SOUTHCOTT, *E. verdense* SOUTHCOTT, *E. centrale* SOUTHCOTT, *E. australiense* SOUTHCOTT, *E. robauxi* SOUTHCOTT, *E. macfarlanei* SOUTHCOTT and *E. sorbasiensis* MAYORAL & BARRANCO (FEIDER 1977, SOUTHCOTT



18-23. *Eutrombidium fortunatae*: 18 - idiosoma and gnathosoma, dorsal view, 19 - idiosoma and gnathosoma, ventral view, 20 - scutum, 21 - scutellum, 22 - leg I, tarsus-coxa, 23 - leg III, tarsus-coxa

1993, MAYORAL & BARRANCO 2004). It differs from *E. feldmanmuhsamae* in the lack of lanceolate AL scutalae, fnFe (6 vs 5), lacking microseta κ, longer PW (130 vs 90), SB (94 vs 68-73) and AL (48 vs 23-24); from *E. orientale* in shorter L (116 vs 120-145), MA (42 vs 50-66), leg I (278 vs 315), leg III (254 vs 300), SA/SP (1.36 vs 1.48-1.78), roxala on TaIII nude (setulose in *E. orientale*), scutum and scutellum punctate (vs not punctate) and shape of scutum (in *E. orientale* constricted before posterior angles of scutum); from *E. africanum* in punctate scutum and scutellum, shorter leg I (278 vs 350) and leg III (254 vs 350); from *E. trigonum* in shorter L (116 vs 124-145), ASB (94 vs 100-119), SA/SP (<1.5 vs >1.5); from *E. indicum* in longer PW (130 vs 104-106), SB (94 vs 77-79), W (140 vs 122-125), SA (32 vs 24-25), AL (48 vs 36-38) and shorter MA (42 vs 57); from *E. occidentale* in longer PW (130 vs 114-117), shorter MA (42 vs 54), ASB (94 vs 105), SA/SP (1.45 vs 1.26-1.40) and dumala with long setules (in *E. occidentale* short setules); from *E. verdense* in longer PW (130 vs 119-124), shorter ASB (94 vs 106-111), LPS (80 vs 91-98), AM (38 vs 47), QL (36 vs 55-57) and punctate scutum and scutellum; from *E. centrale* in longer PW (130 vs 92-104), W (140 vs 110-120), SB (94 vs 70-82) and LPS (80 vs 63-72); from *E. australiense* in shorter AW (108 vs 71-87), PW (130 vs 88-100), W (140 vs 95-113), TaI (74 vs 56-67) and lack of reticular pattern; from *E. robauxi* in shorter MA (42 vs 54-57), longer AW (108 vs 84-97), PW (130 vs 90-98), SB (94 vs 63-72), W (140 vs 102-116), AL (48 vs 29-38) and fD (18 vs 26); from *E. macfarlanei* in the lack of reticular pattern on scutum and scutellum, longer AW (108 vs 91), PW (130 vs 98), SB (94 vs 75), W (140 vs 110), AL (48 vs 36) and shorter LPS (80 vs 96) and from *E. sorbasiensis* in shorter MA (42 vs 50-65), longer PW (130 vs 88-105), W (140 vs 98-123), AL (48 vs 28-35), LSS (134 vs 105-115) and not lanceolate AL and PL. Species of the genus *Eutrombidium* are associated with various species of Orthoptera. The presence of this species in Apidae is unusual.

***Eutrombidium carazoense* n. sp.**

ETYMOLOGY

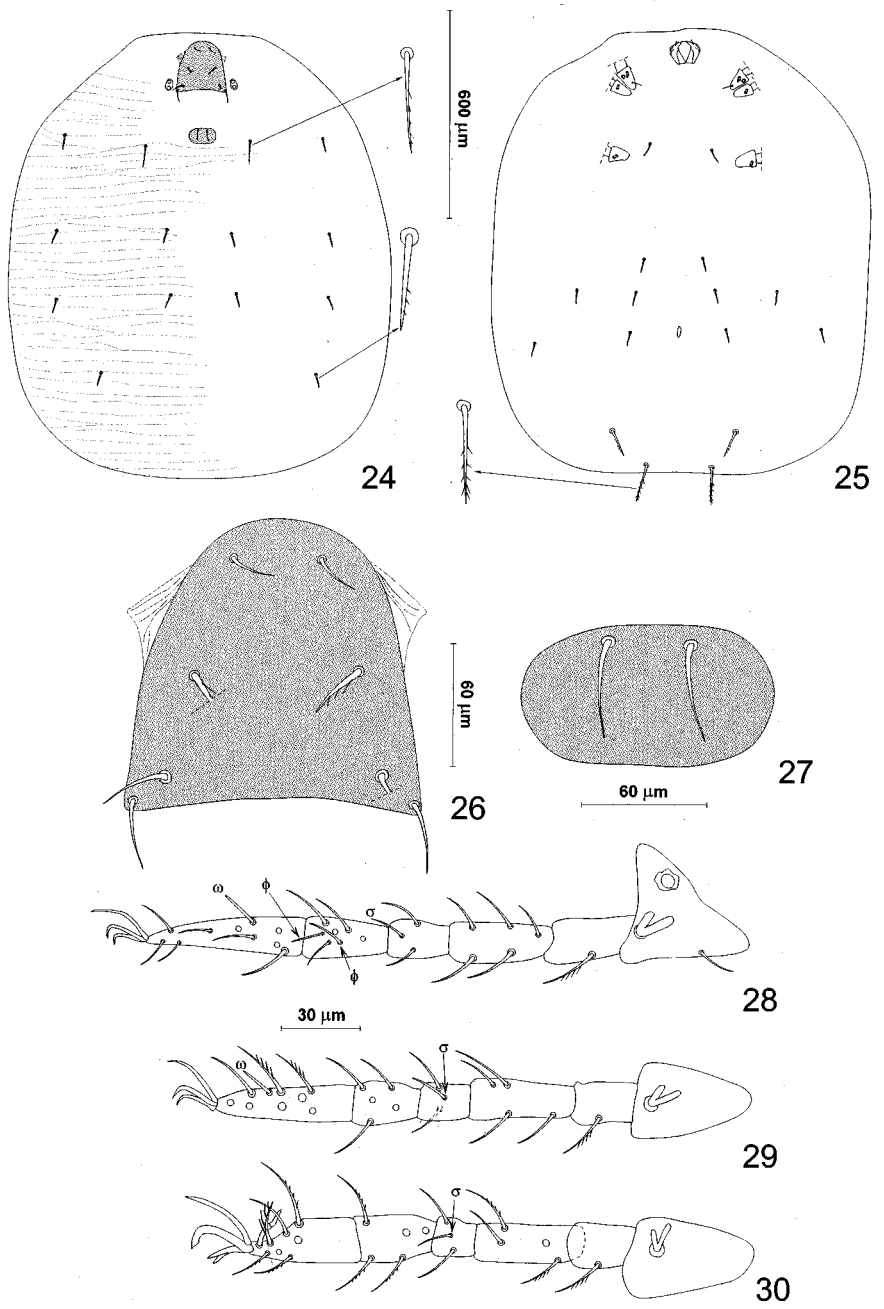
Named after the type locality, town Carazo.

DIAGNOSIS

Idiosoma oval, AW<SB, coxalae deeply cleft with unequally bifurcate lobes, nfFe 5-4-4, nfTi 5-5-5, AL 38-46, PL 26-28.

DESCRIPTION

Larva. Idiosoma longer than wide. Dorsum of idiosoma ornamented with 14 slightly barbed setae; anterior setae are longer than posterior setae. Eyes placed near scutum (fig. 24). Scutum punctate, with anterior border rounded and antero-lateral lobes with lines. Posterior border weakly concave. Scutalae AL barbed, longer and thicker than nude scutalae PL. Anterior sensillae AM and posterior



24-30. *Eutrombidium carazoense*: 24 - idiosoma, dorsal view, 25 - idiosoma and gnathosoma, ventral view, 26 - scutum, 27 - scutellum, 28 - leg I, tarsus-coxa, 29 - leg II, tarsus-coxa, 30 - leg III, tarsus-coxa

sensillae S, both short and nude (fig. 26). Scutellum oval, punctate, with two nude setae; their bases placed at the anterior border of scutellum (fig. 27).

Ventral surface of idiosoma with sternalae 3a and behind coxa III with 14 weakly barbed setae. Posterior setae about three times longer than anterior setae. Anus placed in the middle of opisthosoma. Distal coxala I and coxalae II-III, all deeply cleft with unequally bifurcate lobes; proximal coxala I thin and nude, close to border of coxa (fig. 25).

Gnathosoma very slightly visible, setae sc1 conical.

Leg lengths (with coxa, without claws) I 248 holotype, 244-256 paratypes, II 236, 226-234, III 228, 224-240. Ip = 712 holotype, 704-720.

Setal formula. Leg I. Ta 1ω, 10; Ti 2φ, 5; Ge 1σ, 2; Fe 5; Tr 1 (fig. 28).

Leg II. Ta 1ω, 8; Ti 5; Ge 1σ, 2; Fe 4; Tr 1 (fig. 29).

Leg III. Ta 8; Ti 5; Ge 1σ, 2; Fe 4; Tr 1 (fig. 30).

Metric data are given in Table 2.

TYPES

Holotype: NICARAGUA, La Boquita n. Carazo, 16 II 1998, from undetermined Gryllidae (Orthoptera); paratypes: 3 larvae, same data as holotype, all from wings; leg. R. Haitlinger (preserved in MNHWU, paratypes in author's collection).

REMARKS

E. carazoense n. sp. belongs to the species group with deeply cleft coxalae, with unequally bifurcate lobes. To this group belong *E. mossadeghi* SABOORI & NEMATI, *E. sepasgosariani* SABOORI, NEMATI & MOSSADEGH and *E. mbuensis* HAITLINGER (SABOORI, NEMATI & MOSSADEGH 2000, SABOORI & NEMATI 2001, HAITLINGER 2003). It differs from *E. mossadeghi* in shorter AW (70-80 vs 105-109), PW (104-120 vs 135-143), SB (90-92 vs 102-106), LPS (62-68 vs 153) and TaI (62-68 vs 104-109); from *E. sepasgosariani* in longer PW (104-120 vs 99-102), SB (90-92 vs 72-74), LPS (62-68 vs 38-44), fD (14 vs 22), fV (14 vs 10) and from *E. mbuensis* in longer PW (104-120 vs 102), SB (90-92 vs 78) and shorter PL (26-28, nude vs 48, pilose). From all above-mentioned species it differs in nfFe 5-4-4 and nfTi 5-5-5.

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