

ARTÍCULO:

**A new species of the genus *Erythraeus* Latreille, 1806 (Acari: Erythraeidae) from the Gypsum Karst of Sorbas in the south of Spain**

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ARTÍCULO:

**A new species of the genus *Erythraeus* Latreille, 1806 (Acari: Erythraeidae) from the Gypsum Karst of Sorbas in the south of Spain**

**Jaime G. Mayoral & Pablo Barranco**

**Abstract:**

During a systematic field sampling in the Gypsum Karst of Sorbas Natural Park, 4 specimens belonging to the genus *Erythraeus* were captured. In the present work *Erythraeus (Zaracarus) ruizporterae* sp. n. is described from Almería, Spain, based on larval specimens. In addition, *Erythraeus (Erythraeus) southcotti* Goldarazena & Zhang, 1998 is reported for the south of Spain (Andalucía).

**Key words:** Acari, Erythraeidae, *Erythraeus*, *Zaracarus*, Almería, Spain.

**Taxonomy:** *Erythraeus (Zaracarus) ruizporterae* sp. nov.

**Una nueva especie del género *Erythraeus* Latreille, 1806 (Acari: Erythraeidae) del Karst en Yeso de Sorbas, Almería, España.**

**Abstract:**

En el transcurso de unos muestreos sistemáticos en el Parque Natural del Karst en Yeso de Sorbas se capturaron 4 ejemplares pertenecientes al género *Erythraeus*. En el presente trabajo se describe *Erythraeus (Zaracarus) ruizporterae* sp. n. de Almería, España. También, *Erythraeus (Erythraeus) southcotti* Goldarazena & Zhang, 1998 se cita para Andalucía por primera vez.

**Palabras clave:** Acari, Erythraeidae, *Erythraeus*, *Zaracarus*, Almería, Spain.

**Taxonomía:** *Erythraeus (Zaracarus) ruizporterae* sp. nov.

**Introduction**

Forty four larval-stage species of the genus *Erythraeus* Latreille have been identified and characterized from around the world. This genus is divided into two subgenera based on the characters given by Southcott (1995). Basically, the length and expanded base of the anterior scutulae, and the presence of strong cuticular structures at the bases of the anterior sensillae of scutum distinguish the subgenus *Zaracarus* Southcott from *Erythraeus*. A total of 5 species have been described from Spain: two in the subgenus *Erythraeus*: *Erythraeus (Erythraeus) southcotti* Goldaracena & Zhang, 1998 and *Erythraeus (Erythraeus) tinnae* Hailinger, 1997; and three in the subgenus *Zaracarus*: *Erythraeus (Zaracarus) lancifer* Southcott, 1995, *Erythraeus (Zaracarus) fabiolae* Hailinger 1997 and *Erythraeus (Zaracarus) preciosus* Goldarazena & Zhang, 1998 (Southcott, 1995; Hailinger, 1997; Goldarazena & Zhang, 1998).

Four larval specimens belonging to the genus *Erythraeus* were collected during a field sampling by Carmen Ruiz-Portero in the Gypsum Karst of Sorbas, Natural Park (Almería, Spain). As a result of this study *Erythraeus (Zaracarus) ruizporterae* sp. n. is described and *Erythraeus (Erythraeus) southcotti* Goldarazena & Zhang, 1998 that is known from other regions in the north of Spain is reported for the first time for Andalucía.

## Material and Methods

Specimens were captured using pitfalls baited with goat excrement. Insects and mites falling into the trap were killed with a solution of water, chloral hydrate and detergent to ensure that they die and sink quickly. The collected material was separated according to the order that they belong to and mites preserved in Oudemans' fluid.

All the measurements and illustrations were made from specimens cleared in 50 % lactic acid and mounted on microscope slides in Hoyer's medium. Illustrations were made using a Nikon Optiphot-2 compound microscope with a drawing attachment.

The terminology and abbreviations are adapted from Haitlinger (1999). All the measurements are expressed in micrometers.

## Results

### *Erythraeidae Robineau-Desvoidy, 1828*

#### *Erythraeus Latreille, 1806*

#### *Erythraeus (Zaracarus) ruzporterae* sp. n.

Figs. 1-8

**TYPE MATERIAL.** Holotype larva: P.N. Karst en Yeso de Sorbas (Almería). España. 12-06-2002. (R-76A). Collected by C. Ruiz-Portero. Paratype: one larva, same locality and collector (R-76B). Holotype is deposited in the Museo Nacional de Ciencias Naturales de Madrid. Paratype is deposited in the authors' collection.

**ETYMOLOGY.** The specific name is in recognition of the collector Carmen Ruiz Portero for providing these specimens and many others.

**DESCRIPTION.** Idiosoma rounded, dorsal surface with 30 setulose setae (Fig. 1a). Prodorsal scutum 1.5 times wider than longer and bearing 2 pairs of setae (AL and PL) and 2 pair of sensillae (AM and S). Anterior merge of the scutum slightly concave, posterior convex and lateral margins strongly convex. Posterior pair of sensillae (S) nude and located posterior to PL setae, near the posterior border of the scutum. AL and PL are highly barbed, AL 2 times longer than PL and with the bases expanded. AL and anterior sensillary setae (AM) inserted at the same level at the anterior part of the scutum. One pair of circular eyes at each side of the scutum, not on platelets (Fig. 1a).

Ventral surface of idiosoma bearing 4 sternalae and 14-15 setulose setae (Fig. 1b). Sternalae 1a pointed 3a bifid at the end, both setulose. Each coxae I-III with one seta; coxala 1b and 3b pointed coxala 2b with distal bifid end; all coxalae barbed. Gnathosoma with galealae and hypostomale nude (Fig. 2a). Palpal femur and genu with 1 barbed seta (Fig. 2b). Palpal tibia with two nude and one barbed setae (Fig. 2b-c). Tarsus with 8 setae (including euphatidium and solenidion). Palpal setal formula: 0-B-B-BNN-NNB BBB $\zeta$  $\omega$ .

Legs formula: segmentation formula: 7-7-7. Leg setal formula: Leg I: Ta: 1 $\omega$ , 1 $\epsilon$ , 2 $\zeta$ , 24B; Ti: 2 $\phi$ , 1Cp, 1 $\kappa$ , 14B; Ge: 1 $\sigma$ , 1 $\kappa$ , 8B; Tf: 5B; Bf: 3B; Tr: 1B (Fig. 3-4). Leg II: Ta: 1 $\omega$ , 2 $\zeta$ , 21B; Ti: 2 $\phi$ , 15B; Ge: 1 $\kappa$ , 8B; Tf: 5B; Bf: 3B; Tr: 1B (Fig. 5-6). Leg III: Ta: 1 $\zeta$ , 24B; Ti: 1 $\phi$ , 15B; Ge: 8B; Tf: 5B; Bf: 3B; Tr: 1B (Fig. 7-8). IP= 1115 + 1017 + 1277 = 3409 (holotype). IP= 1073 + 966 + 1211 = 3250 (paratype). Measurements are given in Table I.

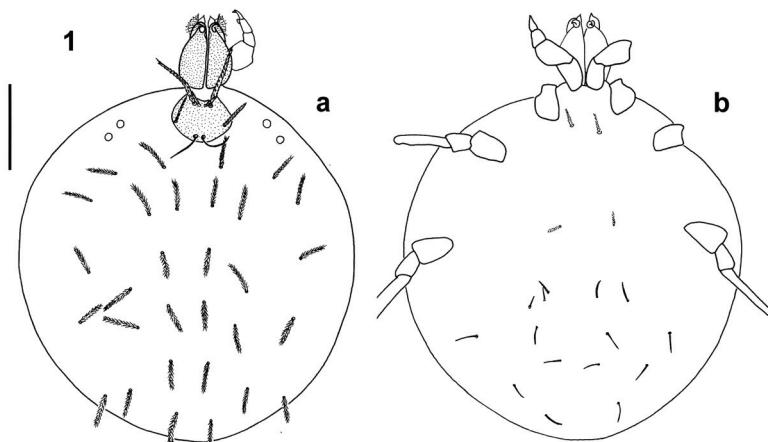
**DISCUSSION.** The studied specimens belong to the subgenus *Zaracarus* in the *Erythraeus* genus by the special features given by Southcott (1995). The 3+3 basifemoral setal formula relate the material from the Gypsum Karst of Sorbas with nine species: *E. (Z.) lancifer* Southcott, 1995, *E. (Z.) fabiolae* Haitlinger, 1997, *Erythraeus (Zaracarus) rajabii* Saboori, 2000, *Erythraeus (Zaracarus) longipedus* Saboori & Nowzari, 2001, *Erythraeus (Zaracarus) aydinicus* Saboori, Cakmak & Nouri-Gonbalani, 2004 and *Erythraeus (Zaracarus) sibuljincus* Haitlinger, 2004, *Erythraeus (Zaracarus) jinkaensis* Haitlinger 2005, *Erythraeus (Zaracarus) kastaniensis* Haitlinger, 2006, *Erythraeus (Zaracarus) passidonicus* Haitlinger, 2006 (Haitlinger, 1997, 2004, 2005, 2006; Saboori, 2000; Saboori, Cakmak & Nouri-Gonbalani, 2004; Saboori & Nowzari, 2001; Southcott, 1995).

The length of the Ti III (longer than 300 but shorter than 400  $\mu$ m) and the length of AL setae in the scutum (longer than 140 but shorter than 180  $\mu$ m) (Haitlinger, 2005) relate *E. (Z.) ruzporterae* sp. n. mainly with other two species: *E. (Z.) lancifer* described from Zaragoza, Spain and *E. (Z.) aydinicus* from Aydin, Turkey.

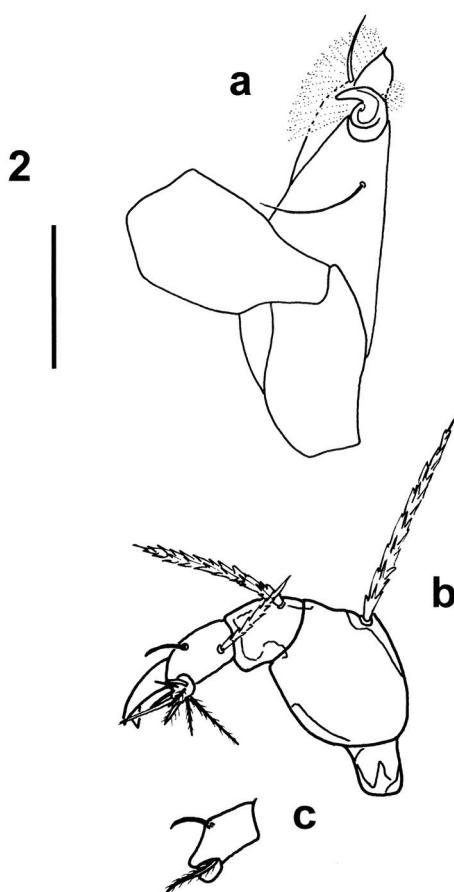
It is possible to easily distinguish *E. (Z.) ruzporterae* sp. n. from the two previously cited species because of the presence of 8 setae in the palp tarsus in the first species and 7 in the other two. In addition, the presence of an extra row of setae on the ventral side of the idiosoma results in 14-15 vs. 12 total ventral setae.

Some other remarkable differences are: in *E. (Z.) lancifer*, the number of solenidialae on Ti II (2 vs. 1); shorter AA (15 vs. 22-35); longer dorsal seta (DS) at the posterior part of the idiosoma (63-70 vs. 47-55) and at the anterior (78-80 vs. 60-66), longer Ta I (170-178 vs. 144-164), Ta II (163-170 vs. 128-144) Ta III (183-190 vs. 128-144), Ti I (278-280 vs. 205-269), Ti III (375-398 vs. 304-355), Ge I (195-210 vs. 153-189) and Cx III (95-98 vs. 39-42), resulting in the total length of its legs (IP) (3280-3409 vs. 2710).

In *E. (Z.) aydinicus* in the shape of the 2a coxala (bifid vs. pointed), the number of dorsal setae (32 vs. 30) and shorter AL (145-150 vs. 165-167), resulting the ratio parameter AL/PL (1.93-2.05 vs. 2.36-2.39); also they differ by longer DS at the posterior part of the idiosoma (63-70 vs. 53-56) and at the anterior (78-80 vs. 68), 1b coxalae (112-114 vs. 92), ISD (75 vs. 61-66), W (160-163 vs. 138-146), Bf I (150-153 vs. 133-134), Bf III (150-160 vs. 158-170), Tr I (73-75 vs. 56-65), Tr II (70-75 vs. 56-65) and Cx III (95-98 vs. 80).



**Figure 1.** *Erythraeus (Zaracarus) ruzporterae* sp. n. Idiosoma and gnathosoma, holotype: **a**, dorsal view; **b**, ventral view. Scale 210  $\mu\text{m}$



**Figure 2.** *Erythraeus (Zaracarus) ruzporterae* sp. n. **a** Gnathosoma ventral view, holotype. **b**, palp, tarso-trochanter, dorsal view; **c**, palp, tibia, ventral view. Scale 100  $\mu\text{m}$

The mites studied in this work were unintentionally captured in the pitfall originally designed for the capture of other arthropods; unfortunately, it is not pos-

sible to know which was the host of this species because the mites were found free living in the trap. Even though, the size of the mites and the overall appearance suggest that they had been already parasiting their host and were ready to molt.

#### **Erythraeidae Robineau-Desvoidy, 1828**

#### *Erythraeus* Latreille, 1806

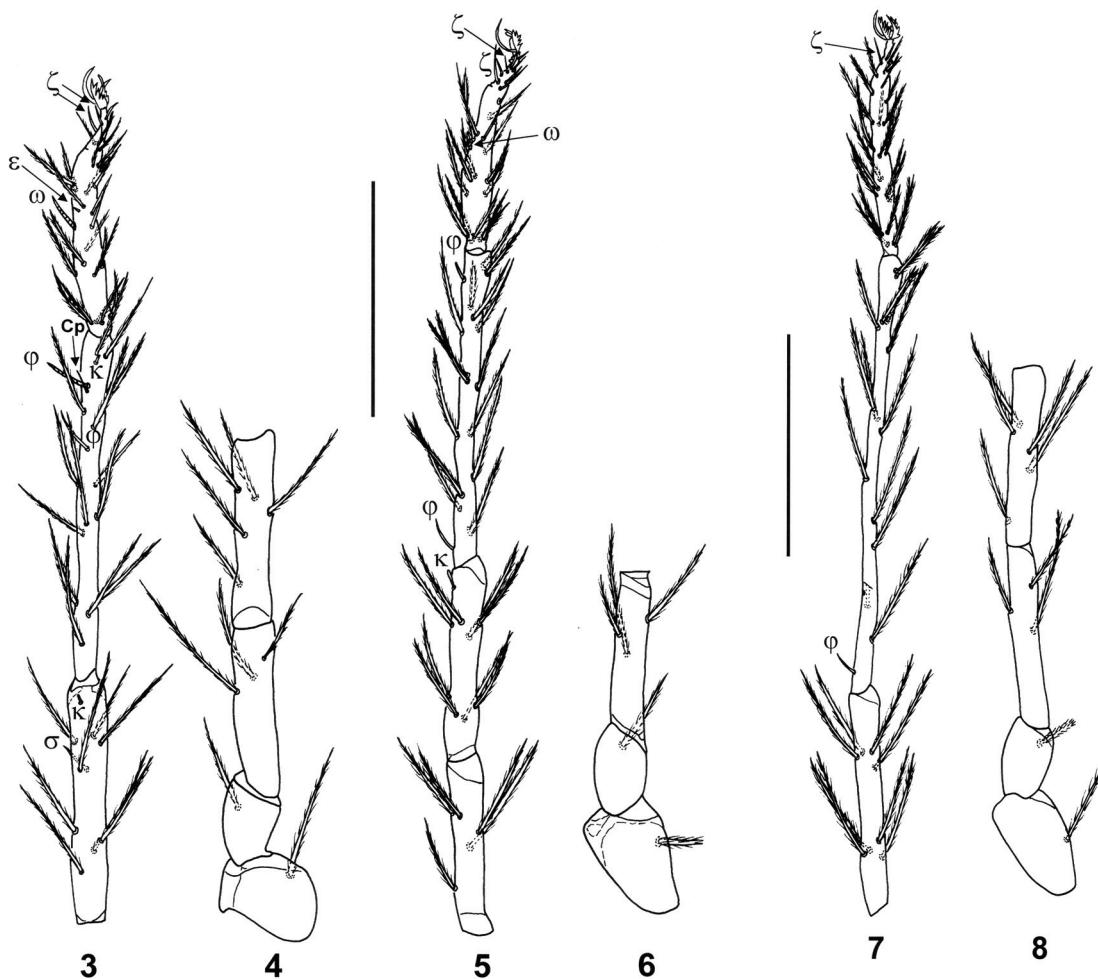
*Erythraeus (E.) southcotti* Goldarazena & Zhang, 1998

**MATERIAL EXAMINED.** Two larvae from P.N. Karst en Yeso de Sorbas (Almería). España. 12-06-2002 (R-76C); 26-06-2002 (R-78D). Both collected by C. Ruiz-Portero.

**DISCUSSION.** *Erythraeus (E.) southcotti* was described from the provinces of Navarra and Zaragoza in the north of Spain parasitizing Homoptera (Goldarazena & Zhang, 1998). Haitlinger (2007) reported this species from Santa Eulalia (Galicia), also from the north of Spain, with no associate host. Haitlinger (2002) captured 23 larvae from 8 different locations in Mallorca (Balearic Islands) belonging to *Erythraeus (E.) southcotti*. All of them were captured on plants except for one which was obtained from an undetermined Aphidoidea (Homoptera). He reported this species as "very common" to the island. In this work, we report two larvae that were captured from the south of Spain (Almería, Andalucía). This is the first time that *Erythraeus (E.) southcotti* has been captured in the south of Spain.

#### **Acknowledgements**

We thank Mario Perez for the revision of the MS.



**Figures 3-6.** *Erythraeus (Zaracarus) ruizporterae* sp. n. Legs I-II, paratype. 3, leg I, tarsus-genua; 4, leg I, tibia-coxa; 5, leg II, tarsus-genua; 6, leg II, tibia-coxa. Scale 210 µm

**Figures 7-8.** *Erythraeus (Zaracarus) ruizporterae* sp. n. Leg III, paratype. 7, tarsus-genua; 8, tibia-coxa. Scale 210 µm

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**Table I.**  
Metric data for *Erythraeus (Zaracarus) ruizporterae* sp. n. larva. Measurements are in  $\mu\text{m}$ .

Character	Holotype	Paratype	Character	Holotype	Paratype
<b>IL</b>	878	1315	<b>Ti I</b>	278	280
<b>IW</b>	783	946	<b>Ta I</b>	178	170
<b>AM</b>	28	28	<b>Cx II</b>	90	93
<b>S</b>	73	70	<b>Tr II</b>	70	75
<b>AL</b>	145	150	<b>Tf II</b>	125	130
<b>PL</b>	75	73	<b>Bf II</b>	130	125
<b>AW</b>	40	43	<b>Ge II</b>	160	155
<b>PW</b>	120	120	<b>Ti II</b>	272	255
<b>AA</b>	15	15	<b>Ta II</b>	170	163
<b>SB</b>	18	18	<b>Cx III</b>	98	95
<b>AP</b>	60	60	<b>Tr III</b>	63	63
<b>SP</b>	40	60	<b>Tf III</b>	173	160
<b>ISD</b>	75	75	<b>Bf III</b>	160	150
<b>W</b>	163	160	<b>Ge III</b>	195	185
<b>DS</b>	70-80	63-78	<b>Ti III</b>	398	375
<i>la</i>	44	42	<b>Ta III</b>	190	183
<i>lb</i>	112	114	<b>Ti I/Ge I</b>	1.32	1.44
<i>2b</i>	44	44	<b>Ti II/Ge II</b>	1.70	1.65
<i>3b</i>	53	53	<b>Ti III/Ge III</b>	2.04	2.03
<b>Cx I</b>	75	68	<b>AW/AL</b>	0.28	0.29
<b>Tr I</b>	73	75	<b>AW/ISD</b>	0.53	0.57
<b>Tf I</b>	148	135	<b>PW/AW</b>	3.00	2.79
<b>Bf I</b>	153	150	<b>AL/PL</b>	1.93	2.05
<b>Ge I</b>	210	195			

