

A NEW SPECIES OF *STIGMAEUS* FROM SPAIN,
RE-DESCRIPTION OF *S. CORTICEUS* KUZNETZOV & WAINSTEIN
AND A KEY TO THE EUROPEAN SPECIES OF *STIGMAEUS* (STIGMAEIDAE)

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EUROPE
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KEY
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SPAIN
STIGMAEUS

SUMMARY: During two studies on Acari biodiversity in southwest Europe, two species of *Stigmaeus* were found. A new species, *Stigmaeus cataloniensis*, collected from grapevine in Spain is described and illustrated and *Stigmaeus corticeus* Kuznetzov *et* Wainstein collected from weeds in France, is re-described. A key to the known European species of *Stigmaeus* is provided.

RÉSUMÉ : Au cours de l'étude de la biodiversité aracologique du sud ouest de l'europe, deux espèces de *Stigmaeus* ont été récoltées. La nouvelle espèce, *Stigmaeus cataloniensis* des vignobles espagnols est décrit et illustré, et *S. corticeus* Kuznetzov et Wainstein est redécrit de France. La clé des espèces connues d'Europe est fournie.

INTRODUCTION

Except for Australia, *Stigmaeus* is found worldwide and most of its species are known to be free-living or parasitic on insects (HIRST, 1926; MITRA & MITRA, 1953; SWIFT, 1987). To date, about 90 species (excluding *Species Inquirenda*) of *Stigmaeus* have been described worldwide. Of these, 35 species were either described or recorded from Europe. Despite the presence of *Stigmaeus* species in many European countries, none has been recorded from southwestern countries (France, Spain and Portugal). In this paper, we describe and illustrate a new species of *Stigmaeus* collected from grapevine in Spain and re-describe *Stigmaeus corticeus* Kuznetzov *et* Wainstein collected from weeds in France. We also provide a key to the known species of *Stigmaeus* recorded in Europe.

MATERIALS AND METHOD

The mites were collected during two studies conducted on Acari biodiversity in Spain (Baldomar, Catalonia) on grapevine and in France (Buzet, Lot-et-Garonne) on weeds. Mites were extracted from grapevine leaves by washing and application of liquid paraffin as described by FARAJI *et al.*, 2004 and from weeds by placing foliage on a modified Berlese/Tullgren funnel. Mites then were cleared in lactophenol and mounted in Hoyer's medium. Measurements were made from slide-mounted specimens using stage calibrated ocular micrometers. Gnathosoma was measured from the base of the maxillicoxae to the tip of palptibial claw and chelicerae from the tip of movable cheliceral digit to the posterior margin of cheliceral base. Length of idiosoma from the anterior

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part of idiosoma to the posterior margin of suranal shield, width at level of setae c_1 . Setae were measured from alveoli to tips. Legs from the base of coxae to tip of tarsal claws. All measurements are in micrometers (μm). Both setae and solenidia were included in the counts for the setal formulae of the leg and palp segments.

The first given measurement is for holotype, in parenthesis are the maximum and minimum followed by the mean. Where only one measurement is given it refers to the mean. Dorsal setal and shield designations follow KETHLEY (1990) and SUMMERS (1962) respectively. All the *Stigmaeus* species described or recorded from former Soviet Union countries and Turkey are also included in the key of *Stigmaeus* of Europe. The type material is preserved as slide-mounted specimens and will be deposited in the National Museum of Natural Sciences, Madrid (NMNS).

Stigmaeus Koch

Stigmaeus Koch, 1836: fasc. 4(9).

TYPE SPECIES: *Stigmaeus cruentus* Koch, 1836.

Robust species with well sclerotised dorsal shields or delicate species without distinct shields; if dorsal shields absent then dorsal setae situated on platelets; number of shields and platelets may vary from 10 to 16 with 13-14 pairs of setae on them; prodorsum (*pr*) with four pair of setae on a single large or on a large median and a pair of auxiliary shields (*au*), opistosomal shielding (with 9-10 setae) provide with a central shield (*ce*) bearing two to three pairs of setae and three to six paired or unpaired smaller shields: humerals (*hu*), marginals (*ma*), median zonals (*mz*), lateral zonals (*lz*), intercalaries (*in*) each with one pair of setae and suranal (*su*) with two to three pairs of setae; setae e_{1-2} invariably occur on different shields or platelets; eyes may present or absent (FIG. 6).

Key to the European species of *Stigmaeus* (female)

1. Opistosoma without distinct central and marginal plates 2
- Central and marginal plates clearly distinctive 3

2. Genua 6-5-3-3, femora 6-6-3-2... *S. elongates* Berlese
- Genua 5-2-0-1, femora 4-4-3-2 ... *S. caeculus* Barilo
3. Central plate with setae d_1 and e_1 , setae c_1 on a small independent platelets anterior to central plate.....
..... *S. anomalus* Willmann
- Central plate with three pairs of setae c_1 , d_1 and e_1 . 4
- Central plate with two pairs of setae c_1 and d_1 ... 12
4. Eyes present 5
- Eyes not evident..... 9
5. Genua III nude..... 6
- Genua III with one seta 7
6. Genua 4-3-0-1, $ve/sci=119/35=3.4$
..... *S. clitellus* Summers
- Genua 4-2-0-1, $ve/sci=10.4-11.3$ 8
7. Genua 4-4-1-1, $ve/sci=73/41=1.8$. *S. sphagneti* (Hull)
- Genua 4-3-1-1, $ve/sci=80/20=4$ *S. creber* Barilo
8. $ve/le_2=135/96=1.4$, all dorsal setae simple.....
..... *S. longipilis* (Canestrini)
- $ve/le_2=125/20=6.3$, most dorsal setae pectinate
..... *S. fidelis* Kuznetsov
9. Dorsal setae spatulate..... *S. litschitzi* Kuznetsov
Dorsal setae otherwise 10
10. $ve/sci=90/35=2.6$ *S. solidus* Kuznetsov
- $ve/sci=1.4-1.7$ 11
11. vi and ve equal in length (60), idiosoma 390
..... *S. kamili* Dogan et Ayyildiz
- vi (77) shorter than ve (109), idiosoma 480
..... *S. scaber* Summers
12. Eyes not evident..... 13
- Eyes present 24
13. Genua 4-4-1-1..... 25
- Genua otherwise 18
14. One intercalary plate (not a pair). *S. mimus* Summers
- Two intercalary plates (a pair) 15
15. $ve/sci=1.5-1.6$ 16
- $ve/sci=3-3.5$ 17
- $ve/sci=1.9-2.3$ 33
16. Idiosoma 561, c_2 102, ve 74, f_1 , h_2 , h_1 62-66
..... *S. obtectus* Summers
- Idiosoma 390, c_2 55, ve 60, f_1 , h_2 , h_1 42-44
..... *S. petrophilus* Kuznetsov et Petrova
17. Dorsal setae simple, ve 105, c_2 105
..... *S. dignus* Kuznetsov
- Dorsal setae rod-like pilose at the tip, ve 75, c_2 62
..... *S. separatus* Kuznetsov
18. With a single median zonal plate 19
- With a pair of median zonal plates 21
19. Genua III and IV nude..... *S. fissuricola* Halbert
- Genua III and IV with setae 20
20. Genua 6-4-2-3, without reticulation on dorsal and ventral plates *S. constrictus* Summers
- Genua 6-5-3-3, dorsal and ventral plates with reticulation..... *S. stercus* Koznetsov et Petrova
21. Genua 6-3-0-1, without lateral zonal plate
..... *S. planus* Kuznetsov
- Genua 6-5-2-2, with lateral zonal plate 22

22. Tarsi IV with seven setae, lateral zonal plate divided and setae e_2 on small platelets *S. reductus* Barilo
- Tarsi IV with eight setae, lateral zonal plate not divided 23
23. Propodosomal shield entire, lateral zonal plate large 47 long *S. pulchellus* Kuznetzov
- Propodosomal shield divided by striae, lateral zonal plate small 20 long 24
24. $ve/sci=1.1, h_2>c_2>ve$ *S. purpurascens* Summers
- $ve/sci=2.2, c_2>ve>h_2$ *S. cataloniensis* n. sp.
25. $ve/sci=10$ *S. insectus* Willmann
- ve/sci less than 10 26
26. Femur I with four setae *S. rhodomelas* Berlese
- Femur I with six setae 27
27. Femur II with five setae 28
- Femur II with four setae 30
28. Genua 4-4-1-1 *S. corticeus* Kuznetzov et Wainstein
- Genua 3-3-0-0 29
29. Dorsal setae 28-70 long *S. diversus* Barilo
- Most dorsal setae longer than 100
..... *S. nikitensis* Kuznetzov
30. Genua III nude 31
- Genua III with one seta 32
31. Genua IV nude *S. unicus* Kuznetzov
- Genua IV with one seta *S. fusus* Summers
32. Setae e_2 and e_1 subequal, $h_2/h_1=39/23=1.7$, $ve=66$, $sce=31$ *S. calluna* Evans
- Setae e_2 twice as long as e_1 , $h_2/h_1=45/41=1.1$, $ve=90$, $sce=55$ *S. pilatus* Kuznetzov
33. Idiosoma 394, $ve=96$, $sce=60$, $c_2=82$, $ve/sci=2.3$
..... *S. siculosus* (Berlese)
- Idiosoma 500, $ve=143$, $sce=99$, $c_2=136$, $ve/sci=1.9$ *S. luxtoni* Wood*

* The data given by DOGAN (2003) on *Stigmaeus turcica* corresponds with Wood's (1981) description of *Stigmaeus luxtoni*. The differences mentioned (i.e. the distance between propodosomal and central shield) are either intraspecific variations or happens during mounting. Therefore, we consider *S. turcica* a synonym of *S. luxtoni*.

Stigmaeus cataloniensis n. sp.
(Figs. 1-5)

MATERIAL EXAMINED: Holotype ♀, *Vitis vinifera*, Baldomar, Catalonia, Spain, 6.vii.2002, collected by MITOX. Paratypes 3♀ similar data as holotype, but 2♀ 21.vi.2002 & 1♀ 6.vii.2002.

DESCRIPTION: Female (n=4), idiosoma fusiform, 350 (345-360) 351 long, including gnathosoma 470 (440-480) 464 long, 175 (165-188) 176 wide.

Dorsum. With the following distinct dorsal shields: one propodosomal with setae vi , ve , sci ; central with

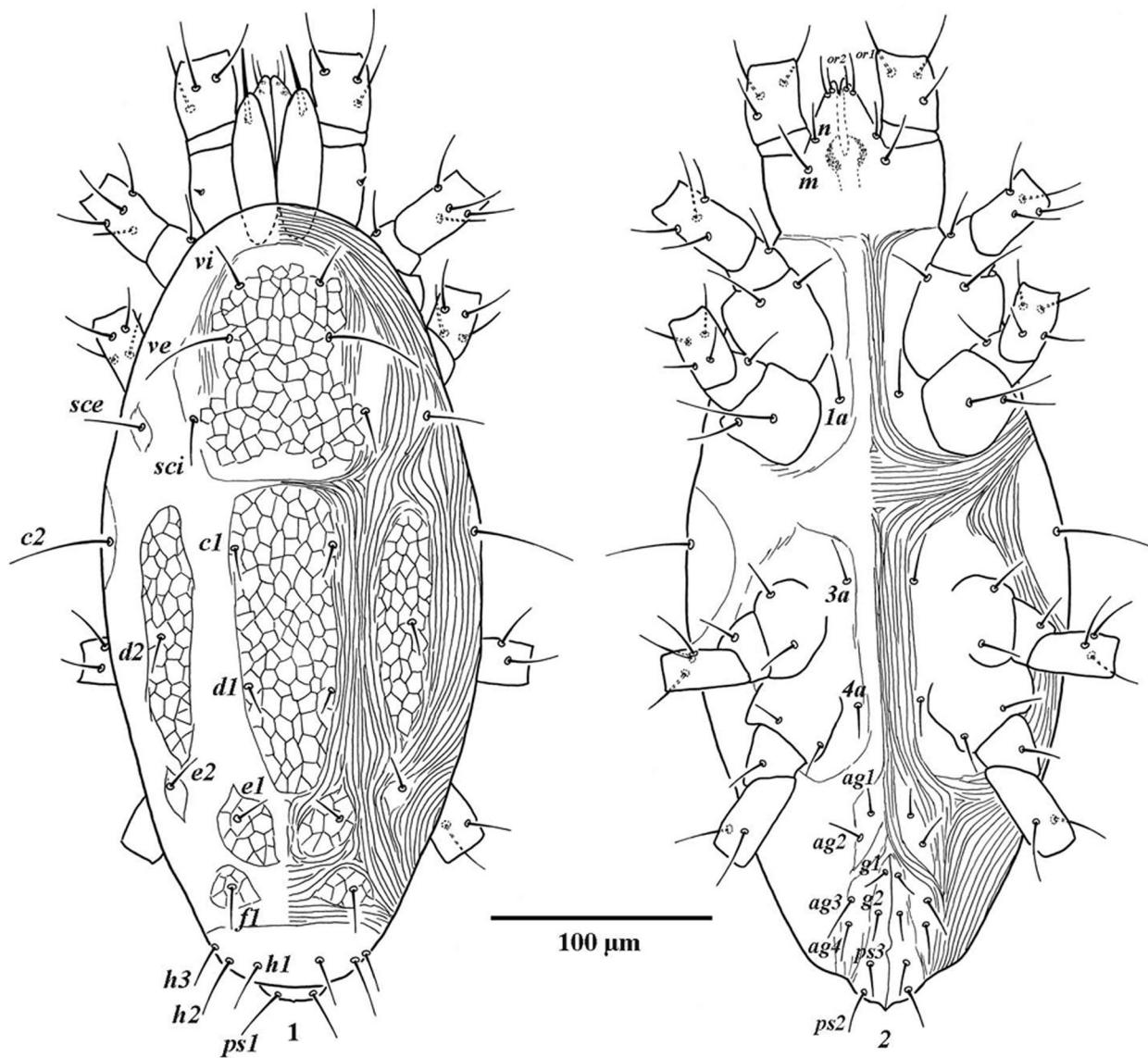
setae c_1 and d_1 ; suranal with setae h_{1-3} ; a pair of humerals with setae c_2 ; marginals with setae d_2 ; median zonals with setae e_1 ; intercalaries with setae f_1 , auxilaries with setae sce and lateral zonals with setae e_2 . Dorsal shields except suranal and humerals are faintly reticulated, dorsal shields are separated by striae, striae also invaded propodosomal shield dividing it to one large median shield and two small lateral platelets; with 14 pairs of dorsal setae (including laterally placed setae c_2), dorsal body setae finely spinose. Length of dorsal setae: $vi=18$ (17-19) 18; $ve=40$ (37-40) 39; $sci=18$ (18-19) 19; $sce=26$ (23-26) 25; $c_1=16$ (15-17) 16; $c_2=47$ (42-47) 45; $d_1=14$ (14-16) 15; $d_2=15$ (15-16) 16; $e_1=15$ (15-16) 16; $e_2=17$ (15-17) 17; $f_1=20$ (19-20) 20; $h_1=21$ (21-22) 21; $h_2=27$ (26-27) 27; $h_3=20$ (19-20) 20. Distances between dorsal setae: $vi-vi=38$ (35-40) 38; $ve-ve=48$ (44-50) 48; $vi-ve=26$ (25-26) 26; $sci-sci=83$ (77-83) 79; $ve-sci=39$ (36-42) 39; $c_1-c_1=46$ (40-46) 43; $d_1-d_1=38$ (35-40) 38; $c_1-d_1=68$ (64-68) 66; $h_1-h_1=30$ (29-30) 30; $h_1-h_2=16$ (16-19) 17. No eyes evident on propodosomal shield (FIG. 1).

Venter. Endopodal shields well separated by striae, with ventral setae $1a=20$, $3a=21$, $4a=18$; aggenital shield is divided by striae behind ag_2 , ag_1 and ag_2 subequal (15), ag_3 and ag_4 also subequal (16), distances $ag_2-ag_3=30$, $ag_1-ag_2=14$ and $ag_3-ag_4=12$; anogenital covers with two pairs of genital setae ($g_1=13$ and $g_2=18$) and three pairs of pseudoanal setae ($ps_1=25$, $ps_2=23$, $ps_3=19$) (FIG. 2).

Gnathosoma. 123 (120-125) 123 long, chelicerae 91 (including movable digit), cheliceral bases elliptical, elongate and not fused, movable digit short 30 and one-third length of cheliceral base, rostrum extends to the middle of palp femur, subcapitular setae $n=17$, $m=33$, $or_1=10$, $or_2=9$, palp five segmented, number of setae on palp-trochanter to tarsus 0-3-1-3 + claw-7 (including solenidion and trifid eupathidium) (FIG. 5).

Legs. Length of legs: I 225 (225-230) 228; II 175 (170-175) 173; III 163; IV 200 (193-200) 198; macrosetae on leg IV 47 (47-52) 49. Number of setae, solenidia and setae κ on leg segments: coxae 2-2-2-2, trochanters 1-1-2-1, femora 4-4-3-2, genua 6(κ)-5(κ)-2-2, tibiae 7(♀, ♂♂)-6(♀♂)-6(♀♂)-6(♀♂), tarsi 14(ω)-10(ω)-8(ω)-8(ω); $\omega I=14$, $\omega II=12$, $\omega III=8$, $\omega IV=7$ (Figs. 3-4).

Male. Not known.



Figs. 1-2. *Stigmaeus cataloniensis* n. sp. adult female (holotype). 1. — Dorsal. 2. — Ventral view of idiosoma.

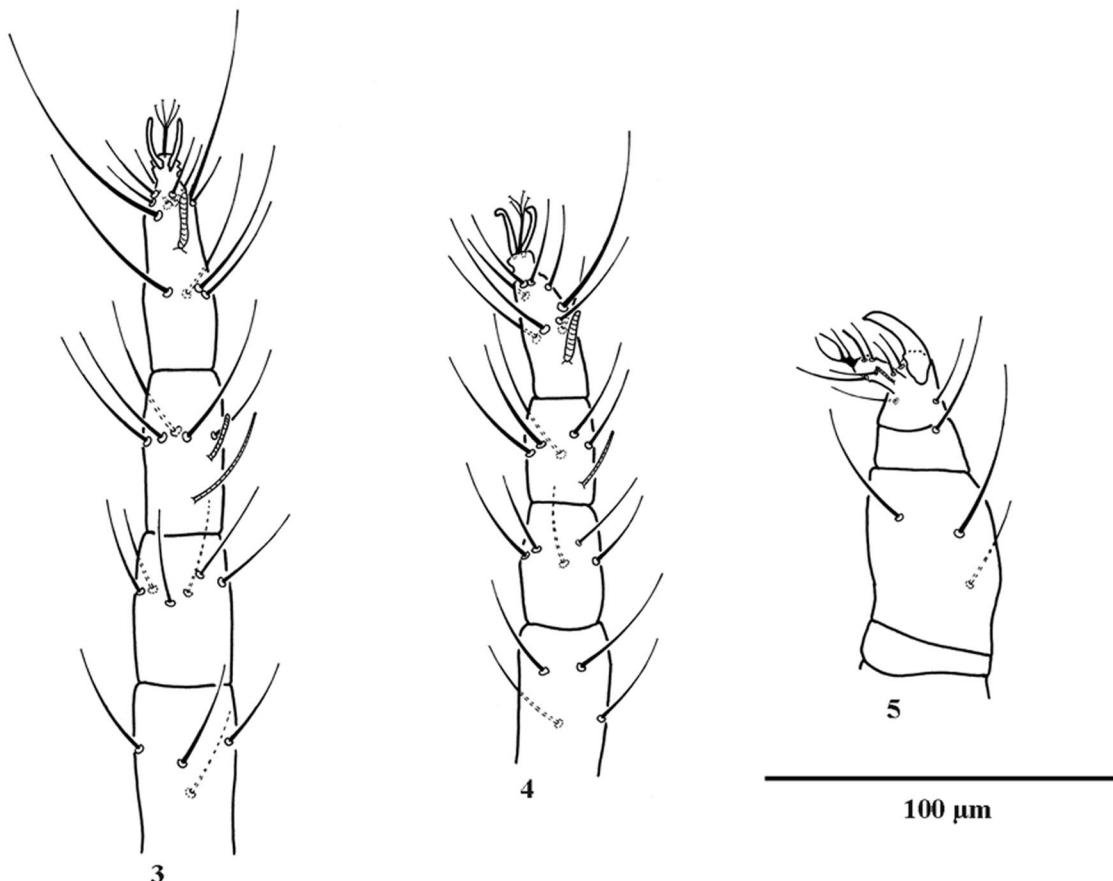
REMARKS

This new species is close to *S. purpurascence* Summers and *S. lucaris* Summers (1962). It differs from *S. purpurascence* by having setae *ve* (39) longer than *sce* (25) as opposed to equal in *S. purpurascence* (*ve* and *sce* both 35). The ratio of *ve/sci* is 2.1 in *S. cataloniensis* and 1.1 in *S. purpurascence*. Setae *c₁* are less than half the length of *c₂* in *S. cataloniensis*, but three quarters

the length of *c₂* in *S. purpurascence*. *Stigmaeus cataloniensis* can be easily discriminated from *S. lucaris* by having four aggenital setae instead of three, the ratio of *c₂/c₁* 3 instead of 1.5 and *ve/h₂* 1.4 instead of 1.

ETYMOLOGY

This species is named after the region “Catalonia” (Spain) of its origin.



Figs. 3-5. *Stigmaeus cataloniensis* n. sp. adult female (holotype). 3. — Leg I (right). 4. — Leg II (right). 5, Palp (right).

Stigmaeus corticeus Kuznetsov et Wainstein, 1977
(Figs. 6-10)

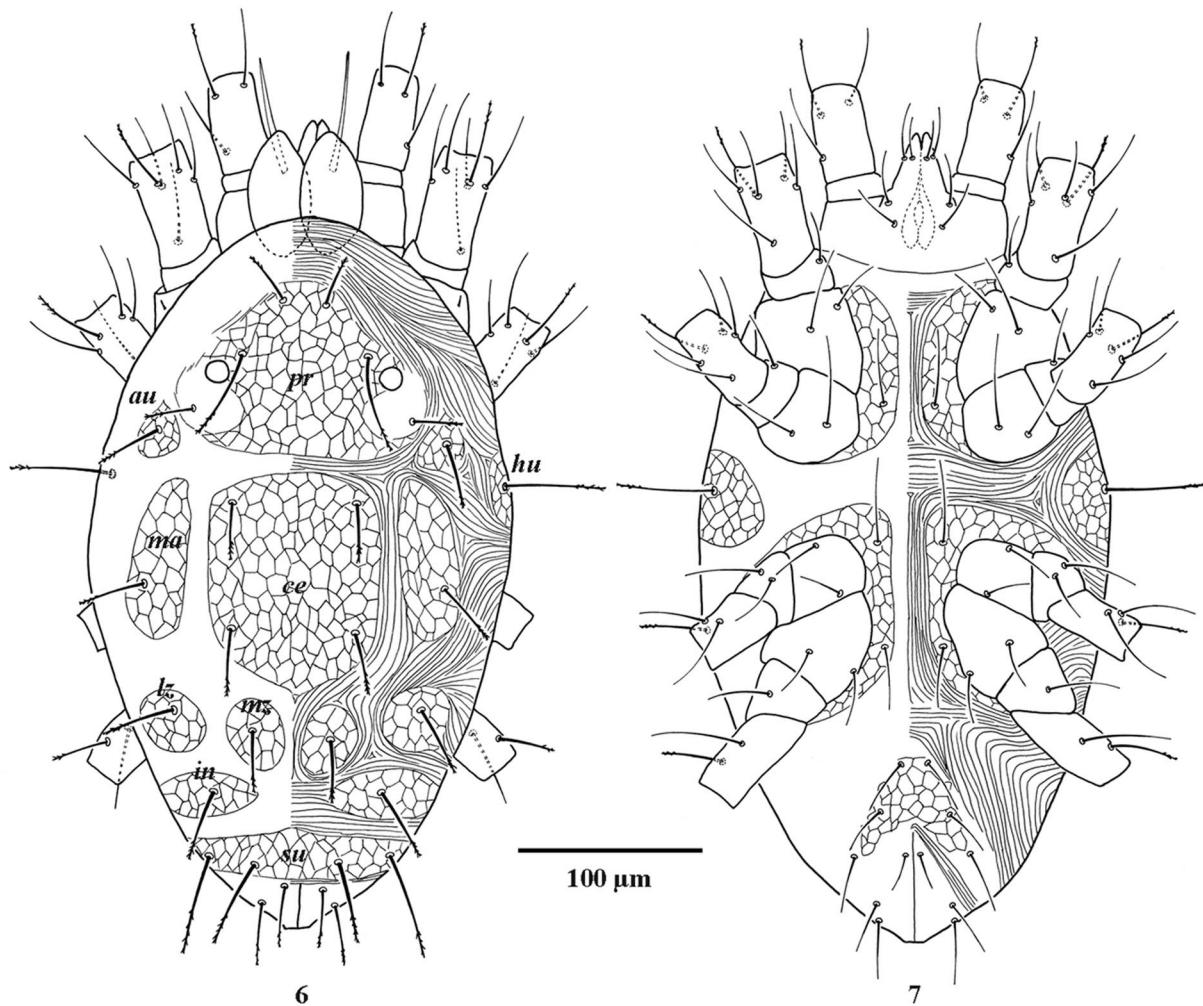
MATERIAL EXAMINED: 3 ♀, weeds (apple orchard), Buzet, Lot-et-Garonne, France, 23.x.2003, collected by MITOX.

DESCRIPTION: Female (n=3), a relatively large species (380-430) 403 long, including gnathosoma (525-600) 563 long, (235-285) 268 wide.

Dorsum. Dorsal shields and position of dorsal setae as in *S. cataloniensis*, but auxilaries and lateral zonals more distinct and larger, suranal shield with only setae h_1 and h_2 . All dorsal shields are well reticulated and separated by striae, but on propodosomal shield between eyes and setae sci smooth; with 13 pairs of dorsal setae (including laterally placed setae c_2), dorsal body setae barbed distally. Length of dor-

sal setae: vi (31-33) 32; ve (51-59) 56; sci (27-32) 30; sce (38-42) 40; c_1 (30-36) 34; c_2 (61-77) 70; d_1 (32-39) 37; d_2 (35-40) 38; e_1 (36-40) 38; e_2 (40-44) 42; f_1 (43-47) 45; h_1 (45-51) 48; h_2 55. Distances between dorsal setae: $vi-vi$ (21-31) 26; $ve-ve$ (72-75) 74; $vi-ve$ (36-43) 39; $sci-sci$ (127-130) 128; $ve-sci$ (43-47) 45; c_1-c_1 (71-78) 75; d_1-d_1 (71-78) 75; c_1-d_1 (75-80) 78; h_1-h_1 (46-50) 48; h_1-h_2 (30-31) 30. Eyes evident on propodosomal shield between setae ve and sci (FIG. 6).

Venter. Endopodal shields reticulated and well separated by striae, with ventral setae $1a$ 34, $3a$ 43, $4a$ 41; aggenital shield also reticulated, ag_1 and ag_3 subequal (31-32), ag_2 shorter (26), ag_1-ag_2 and ag_2-ag_3 subequal (31-32); anogenital covers with one pair of genital setae (g_1) 19, and three pairs of pseudoanal setae (ps_1 33, ps_2 32, ps_3 22) (FIG. 7).



Figs. 6-7. *Stigmaeus corticeus* Kuznetsov et Wainstein adult female. 6. — Dorsal. 7. — Ventral view of idiosoma.

Gnathosoma. (163-175) 168 long, chelicerae 113 long (including movable digit), cheliceral bases fusiform and not fused, movable digit relatively long 71 half length of cheliceral base, rostrum extends almost to the middle of palp femur, subcapitular setae n 33, m 32, or_1 26, or_2 22; palp five segmented, number of setae on palp-trochanter to tarsus 0-3-2-2 + claw-7 (including solenidion and trifid eupathidium) (FIG. 10).

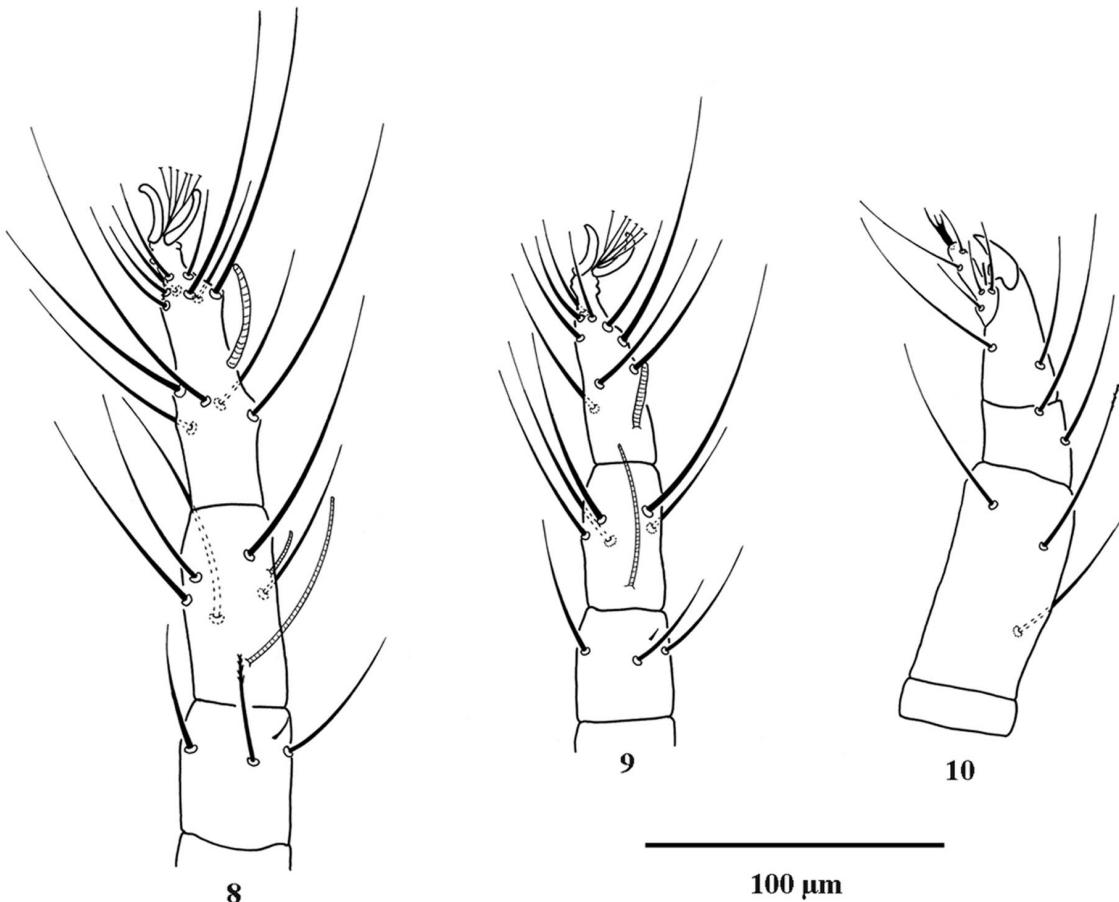
Legs. Length of legs: I (310-320) 315; II (240-260) 252; III (225-240) 233; IV (275-300) 288. Number of setae, solenidia and setae on leg segments: coxae 2-2-2-2, trochanters 1-1-2-1, femora 6-5-3-2, genua 4(κ)-4(κ)-1-1, tibiae 7(φ , $\varphi\varphi$)-6($\varphi\varphi$)-6($\varphi\varphi$), tarsi

14(ω)-10(ω)-8(ω)-8(ω); ω I 28, ω II 18, ω III 10, ω IV 10 (Figs. 8-9).

Male. Not known.

REMARKS

The description given by KUZNETZOV and WAINSTEIN (1977) of *S. corticeus* found in Russia matched the specimens collected in France in all respects. However, the dorsal setae in the France strain are soundly barbed distally opposed to finely barbed over the entire length of the Russian strain and ω I is longer in France strain (28 vs 22).



FIGS. 8-10. *Stigmaeus corticeus* Kuznetsov et Wainstein, adult female. 8. — Leg I (right). 9. — Leg II (right). 10. — Palp (right).

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