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I. Döker, J. Witters, J. Pijnakker, C. Kazak, M. S. Tixier, S. Kreiter

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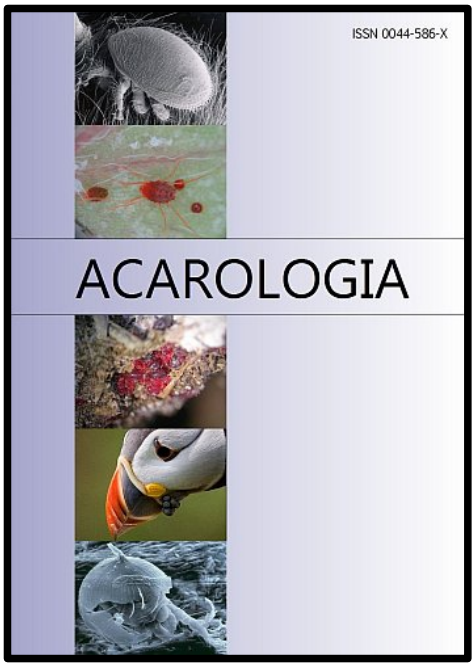
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SHORT NOTE

EUSEIUS GALLICUS KREITER AND TIXIER (ACARI: PHYTOSEIIDAE) IS PRESENT IN FOUR MORE COUNTRIES IN EUROPE: BELGIUM, GERMANY, THE NETHERLANDS AND TURKEY

İsmail DÖKER[1*], Johan WITTERS[2], Juliette PIJNAKKER[3], Cengiz KAZAK[1], Marie-Stéphane TIXIER[4] and Serge KREITER[4]

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[1]*Çukurova University Agricultural Faculty, Plant Protection Department, Acarology Lab., 01330 Adana/Turkey. idoker@cu.edu.tr (* Corresponding author), ckazak@cu.edu.tr*
[2]*Institute for Agricultural and Fisheries Research (ILVO), Plant-Crop Protection, Burg. Van Gansberghelaan 96, 9820 Merelbeke, Belgium. johan.witters@ilvo.vlaanderen.be*
[3]*Biobest Belgium Bv., Ilse Velden 18, 2260 Westerlo, Belgium. juliette.pijnakker@biobest.be*
[4]*Montpellier SupAgro, Unité Mixte de Recherche Centre de Biologie pour la Gestion des Populations INRA/IRD/CIRAD/ Montpellier SupAgro, Campus International de Baillarguet, CS 30016, 34988 Montferrier-sur-Lez cedex, France. tixier@supagro.inra.fr, kreiter@supagro.inra.fr*

ABSTRACT — *Euseius gallicus* is reported from four additional European countries: Belgium, Germany, the Netherlands and Turkey. It is recorded from 4 plant species belonging to 4 families (Convolvulaceae, Malvaceae, Rosaceae and Solanaceae). Measurements based on collected adult females are provided. Finally, comparisons and further observations of type specimens have shown some mistakes on leg chaetotaxy to the original description. The corrected chaetotactic formula is therefore provided.

KEYWORDS — new record; distribution; plants; morphometry; predatory mites

INTRODUCTION

The genus *Euseius* was defined by Wainstein in 1962 with the type species *Seiulus finlandicus* Oudemans, 1915 (Wainstein 1962). This genus is one of the largest genera in the sub-family Amblyseiinae (Acari: Mesostigmata) with more than 188 valid species (Moraes *et al.* 2004; Chant and McMurtry 2007; Tixier *et al.* 2009).

Euseius species are considered as specialized pollen feeders and generalist predators (Croft *et al.* 1997, McMurtry *et al.* 2013). Some of them, such as *E. scutalis* (Athias-Henriot, 1958) and *E. stipulatus* (Athias-Henriot, 1960) are of great importance for Integrated Pest Management (IPM) programs in Mediterranean citrus orchards (*i.e.* Kasap and Sekeroglu 2004; Papadoulis *et al.* 2009). *Euseius gal-*

TABLE 1: Mean, minimum and maximum measurements of females of *Euseius gallicus* Kreiter and Tixier collected from Belgium, the Netherlands, Turkey and those reported in the original description.

	Specimens from Belgium (n=2)			Specimens from the Netherlands (n=3)			Specimens from Turkey (n=3)			Original Description (France, Tixier *et al* . 2009)		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
DSL*	344	334	354	303	300	313	311	308	315	334	259	369
DSW**	192	179	204	179	175	183	178	175	180	226	179	252
j1	34	31	35	37	35	38	34	33	35	33	22	40
j3	35	33	37	35	33	38	33	32	35	34	23	42
j4	15	13	16	14	13	15	14	13	15	13	8	20
j5	15	13	16	15	15	15	13	13	15	15	9	20
j6	19	17	21	14	13	15	17	15	18	17	11	22
J2	19	17	21	14	13	15	18	15	20	18	11	24
J5	7	6	8	6	5	8	5	5	5	5	3	8
z2	32	31	35	30	28	33	29	28	33	29	20	37
z4	34	32	35	28	25	30	30	30	30	31	21	40
z5	15	15	15	14	13	15	14	13	15	14	8	19
Z1	20	18	21	15	15	15	16	15	18	17	11	21
Z4	21	20	23	18	18	20	19	18	20	19	13	25
Z5	56	56	57	60	58	63	56	55	58	54	35	62
s4	43	42	45	33	33	35	38	35	40	41	30	52
S2	23	22	24	18	18	18	19	15	23	22	16	28
S4	24	22	28	18	18	20	23	20	25	22	18	29
S5	29	27	31	29	28	30	29	28	30	28	19	36
r3	17	17	17	15	15	15	15	15	15	15	12	21
R1	16	16	16	15	15	15	15	15	15	15	11	20
StIV	64	56	70	57	53	60	59	55	63	58	39	71

* Dorsal shield length (DSL)

** Dorsal shield width (DSW)

licus Kreiter and Tixier 2009 was recently collected and described from France (Tixier *et al.* 2009). Some field experiments conducted in The Netherlands and France showed that it is one of the most important promising candidates for augmentative biological control of *Frankliniella occidentalis* (Pergande, 1895) (Thysanoptera: Thripidae) and *Trialeurodes vaporariorum* (Westwood, 1856) (Hemiptera: Aleyrodidae). In addition, *E. gallicus* have been available commercially in international markets since January 2014 (Pijnakker and Gui 2013).

This study presents (i) new records of *E. gallicus* from Belgium, Germany, the Netherlands, and Turkey and (ii) some corrections of some morphological features reported in the original description. Measurements (with the exception of German specimens) of adult females are also provided in order to assess intraspecific variations and to secure further diagnosis.

MATERIALS AND METHODS

The specimens were collected on 4 plant species belonging to 4 families. Phytoseiid mites were stored in 95% ethanol and were then cleared in lactophenol solution for 5 hours. The permanent slides were made using Hoyer's medium and kept in a hot plate (50 $^{\circ}$C) during two weeks.

The taxonomic system for the identification is based on Chant and McMurtry (2005; 2007). Setae nomenclature follows that proposed by Lindquist and Evans (1965) as adapted by Rowell *et al.* (1978) for the family Phytoseiidae. Measurements were performed using a Leica DM 2500 microscope with 400X magnification. All measurements are given in micrometers (μm). Because authors do not have permanent slides of German specimens, no measurements were done.

RESULTS

New records for Belgium, Germany, the Netherlands and Turkey *Euseius gallicus* Kreiter and Tixier *Euseius gallicus* Kreiter and Tixier 2009, in Tixier *et al.*: 242. *Type specimens* Montpellier, France, on sour cherry *Prunus cerasus* L. (Rosaceae).

New records from Belgium 4 ♀♀, 2 ♂♂, 27.09.2011, Destelbergen (51°4'17" N, 3°49'1" E), on *Tilia cordata* (Miller) (Malvaceae), Coll. J. Witters.

New records from Germany 10 ♀♀, 5 ♂♂, 27.10.2011, Hohenheim (48°42'43" N, 9°12'20" E), on *Lycium barbarum* L. (Solanaceae), Coll. H. Schneller. (K. M. Schrameyer, pers. com., 09.01.2014).

New records from The Netherlands 5 ♀♀, 3 ♂♂, 05. 10. 2011, Zevenhuizen (52°0'39" N, 4°34'48" E) on *Rosa* sp. cv. Red Naomi (Rosaceae), Coll. J. Pijnakker and A. Leman.

New records from Turkey 5 ♀♀, 1 ♂, 02.07.2012, Boztepe, Trabzon province (40°59'50" N, 39°43'57" E), *Ipomea* sp. (Convolvulaceae), Coll. I. Döker.

World distribution France (Okassa *et al.* 2009; Tixier *et al.* 2009), Tunisia (Kreiter *et al.* 2010), Belgium, Germany, The Netherlands and Turkey (this study).

Remarks

Prior to this study, three species of *Euseius* namely *E. finlandicus*, *E. scutalis* and *E. stipulatus* were known from Turkey (Şekeroğlu 1984; Faraji *et al.* 2011). Only *E. finlandicus* was known in Belgium, Germany and The Netherlands (Miedema, 1987; Moraes *et al.* 2004).

Morphological characters and measurements of Belgian, Dutch and Turkish specimens of *E. gallicus* fit those of the original description (Table 1). Low variations in setal length were observed between the specimens herein reported. This comparison allows to ensure a right diagnosis especially for specimens collected far away from the location of type material. Comparing the present specimens with the type specimens we observed, there are some differences in the original description regarding leg chaetotaxy. We thus checked the type specimens (in the Montpellier SupAgro collection) and we observed two mistakes in the original description: the chaetotactic formula of Genu II and III should be changed as 1-2/0, 2/0-2 and 1-2/1, 2/0-1, respectively (7 setae on each genua and not 6 as indicated in the original description). In addition, the number of setae of genu and tibia IV should be 7 and 6, respectively (and not 6 and 5 as illustrated in the drawings of original description). However these corrections do not invalidate the species status of *E. gallicus*.

In addition to the species morphologically close to *E. gallicus* reported in the original description (*Euseius longiverticalis* (Liang and Ke, 1983), *Euseius amissibilis* (Meshkov, 1991) and *Euseius kirghisicus* (Kolodochka, 1979), it should be noted that it is also close to *Euseius ucrainicus* (Kolodochka, 1979) especially in idiosomal setae but differs from this latter in the peritreme length and spermatheca shape. Furthermore, when *E. gallicus* was described the descriptors sent specimens to Dr. Kolodochka for him checking the new status of this new species in relation to those he already described, *i.e. E. kirghisicus* and *E. ucrainicus* (M.-S. Tixier, pers. Comm. 2014).

This study clearly shows that *E. gallicus* is widespread in Europe (including some northwestern and southern countries) on a wide range of plants. In general, these plants were colonized by *Tetranychus urticae*, *Frankliniella occidentalis* and *Trialeurodes vaporariorum.* Future studies should be conducted on biology and effectiveness of this predatory mite to control spider mites, thrips and whiteflies.

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