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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

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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-
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 °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.

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**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 | 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 |
| j2 | 35 | 33 | 37 | 35 | 33 | 38 | 33 | 32 | 35 | 34 | 23 | 42 |
| j3 | 15 | 13 | 16 | 14 | 13 | 15 | 14 | 13 | 15 | 13 | 8 | 20 |
| j4 | 15 | 13 | 16 | 15 | 15 | 15 | 13 | 13 | 15 | 15 | 9 | 20 |
| j5 | 19 | 17 | 21 | 14 | 13 | 15 | 17 | 15 | 18 | 17 | 11 | 22 |
| j6 | 19 | 17 | 21 | 14 | 13 | 15 | 18 | 15 | 20 | 18 | 11 | 24 |
| j7 | 7 | 6 | 8 | 6 | 5 | 8 | 5 | 5 | 5 | 3 | 8 |
| j8 | 32 | 31 | 35 | 30 | 28 | 33 | 29 | 28 | 33 | 29 | 20 | 37 |
| j9 | 34 | 32 | 35 | 28 | 25 | 30 | 30 | 30 | 30 | 31 | 21 | 40 |
| j10 | 15 | 15 | 15 | 14 | 13 | 15 | 14 | 13 | 15 | 14 | 8 | 19 |
| j11 | 20 | 18 | 21 | 15 | 15 | 15 | 16 | 15 | 18 | 17 | 11 | 21 |
| j12 | 21 | 20 | 23 | 18 | 18 | 20 | 19 | 18 | 20 | 19 | 13 | 25 |
| j13 | 56 | 56 | 57 | 60 | 58 | 63 | 56 | 55 | 58 | 54 | 35 | 62 |
| j14 | 43 | 42 | 45 | 33 | 33 | 35 | 38 | 35 | 40 | 41 | 30 | 52 |
| j15 | 23 | 22 | 24 | 18 | 18 | 18 | 19 | 15 | 23 | 22 | 16 | 28 |
| j16 | 24 | 22 | 28 | 18 | 18 | 20 | 23 | 20 | 25 | 22 | 18 | 29 |
| j17 | 29 | 27 | 31 | 29 | 28 | 30 | 29 | 28 | 30 | 28 | 19 | 36 |
| j18 | 17 | 17 | 17 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 12 | 21 |
| j19 | 16 | 16 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 11 | 20 |
| j20 | 64 | 56 | 70 | 57 | 53 | 60 | 59 | 55 | 63 | 58 | 39 | 71 |

* Dorsal shield length (DSL)
** Dorsal shield width (DSW)
RESULTS

New records for Belgium, Germany, the Netherlands and Turkey *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* (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. Pijnnakker 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 longirocotalis* (Liang and Ke, 1983), *Euseius amissibilis* (Meshkov, 1991) and *Euseius kirghisicus* (Kolodochka, 1979), it should be noted that it is also close to *Eusit us 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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