



Abh. Ber. Naturkundemus. Görlitz	Band 78 Heft 1	S. 3 – 9	2006
--	-------------------	----------	------

ISSN 0373-7586

Beitrag zum 5. Milbenkundlichen Kolloquium vom 6. bis 8. Oktober 2005  
im NLU-Institut Biogeografie der Universität Basel

## **European mites of the genus *Veigaia* Oudemans, 1905 (Acari, Gamasida: Veigaiidae)**

CZESLAW BLASZAK<sup>1</sup>, RAINER EHRNSBERGER<sup>2</sup> & MACIEJ SKORUPSKI<sup>3</sup>

<sup>1</sup>Department of Animal Morphology, A. Mickiewicz University, Poznań, Poland

<sup>2</sup>Institut of Nature Conservation and Environmental Education,  
University of Vechta, Germany

<sup>3</sup>Department of Forest and Environment Protection,  
August Cieszkowski Agricultural University, Poznań, Poland

### **Abstract**

A revision of the European mites of the genus *Veigaia* is given. The current list of mites of the genus comprises 19 confirmed species in Europe. A determination key to the females is given. The European mites of this genus can be divided into four zoogeographic groups.

Keywords: mites, taxonomy, zoogeography

### **Zusammenfassung**

**Europäische Milben der Gattung *Veigaia* Oudemans, 1905 (Acari, Gamasida: Veigaiidae)** – Die europäischen Arten der Milbengattung *Veigaia* wurden revidiert. Gegenwärtig sind 19 Arten für Europa anerkannt, die in vier zoogeographische Gruppen eingeteilt werden können. Ein Bestimmungsschlüssel zu den Weibchen der Gattung wird präsentiert.

### **1. Introduction**

In addition to the genera *Gamasolaelaps* Berlese, 1903 and *Cyrthydroaelaps* Berlese, 1904, the mites of the genus *Veigaia* belong to the family Veigaiidae of the order Gamasida, suborder Gamasina and cohort Dermanyssina. All species of this genus are predatory mites and are common in different forest types. They mainly inhabit the litter and humus layer, and rarely occur in decaying substance. They are also found in moss cushions, grass roots and, rarely, in pastures and meadows.

The species of this genus are highly specialised in their food gathering. The slim, pincer-like chelicerae extend almost the whole length of the body when stretched out. They are well adapted to catch small animals, such as springtails (Collembola) and other mites.

## 2. Materials and Methods

This study is based on literature (WILLMANN 1935, 1936, 1951, EVANS 1955, FARRIER 1957, ATHIAS-HENRIOT 1961, BREGETOVA 1961, 1977, KARG 1971, 1993, SCHMÖLZER 1992, 1995, SKORUPSKI & GOŁOJUCH 1996, BŁASZAK & EHRNSBERGER 2001, BŁASZAK et al. 2004, SKORUPSKI & ŁABĘDZKI 2004) and several years of study by the authors in different collections, of which the most important are the Zoologische Staatssammlung München, Istituto Sperimentale per la Zoologia Agraria in Florence and the British Museum (Natural History) in London.

## 3. Genus *Veigaia* Oudemans, 1905

Diagnosis:

Tectum with extended and differentiated medial pointed projection. Fringe-like lacinae around the hypostome. Genital shield with bristles.

Dorsal shield of female is either divided or entire with lateral incision. Tarsus II to IV between claws with round pulvillae. Metasternal bristles in the female on fused endopodal metasternal shield. Male with sterniti-genital and ventri-anal shield.

### Zoogeographical remarks

The family Veigaiidae consists of only few species and belongs to the smallest family in the order Gamasida. So far, very few species are listed in the published classification keys because each key only covers a restricted number of European species. The first larger key was established by ATHIAS-HENRIOT (1961) in the paper on mesostigmata for mites of the Mediterranean area. This key only includes 13 species, mainly from Western and Central Europe. In 1971, KARG presented a key for Central Europe comprising 10 species and later, in his work of 1993, 11 species. The most comprehensive key was established by BREGETOVA (1977) and contains 25 species, including 14 from Europe. The other species occur in Asia.

### Zoogeographic distribution of the species of the genus *Veigaia*

Currently, there are 19 confirmed species of this genus in Europe, divided into the following zoogeographic groups:

#### I. European species

<i>V. agilis</i> (Berlese, 1916)	European species
<i>V. cerva</i> (Kramer, 1876)	Holarctic species
<i>V. exigua</i> (Berlese, 1917)	European species

<i>V. kochi</i> Trägårdh, 1901	Palearctic species
<i>V. nemorensis</i> (C. L. Koch, 1839)	Holarctic species
<i>V. planicola</i> Berlese, 1892	Palearctic species
<i>V. propinqua</i> Willmann, 1936	European species
<i>V. transisalae</i> Oudemans, 1902	European species

## II. East European species (perhaps a Siberian faunal element)

<i>V. igolkini</i> Bregetova, 1961	European Urals
<i>V. sibirica</i> Bregetova, 1961	European Urals

## III. West European species (perhaps an Atlantic and Mediterranean faunal element)

<i>V. bouvieri</i> (Berlese, 1916)	England, France, Spain
<i>V. garraldensis</i> Athias-Henriot, 1961	Spain
<i>V. perinsolita</i> Athias-Henriot, 1961	Spain
<i>V. sanmamedi</i> Athias-Henriot, 1961	Spain

## IV. Central European species

<i>V. inexpectata</i> Kaluz, 1993	Slovakia (Cave)
<i>V. leruthi</i> Willmann, 1935	Belgium (Cave)
<i>V. mollis</i> Karg, 1971	Germany and Poland (Forest)
<i>V. paradoxa</i> Willmann, 1951	Austria (Cave)
<i>V. lauseggeri</i> Schmölzer, 1992	Austria (Cave)

The distribution of zoogeographically interesting species of the genus *Veigaia* is presented in Fig. 1.

## 4. Remarks

According to Bregetova (1977) *Veigaia exigua* probably corresponds to *V. agilis*, and *V. decurtata* Athias Henriot is certainly identical with *V. exigua* Berlese.

The mistake occurred when, in 1961, Athias Henriot described a supposedly new species as *V. decurtata*. *V. decurtata* is, however, a synonym for *V. exigua*. We verified this after a comparison of the type of *V. exigua* Berlese in the Berlese collection. The species *V. decurtata* is not included in Karg's two keys.

Schmölzer's description and drawings of the species *V. relictata* Schmölzer, 1995 is so imprecise that it is not possible to determine whether this is a new species. Unfortunately, we could not yet verify the type (which is in his private collection). *V. relictata* is probably *V. sanmamedi* Athias-Henriot, 1961, but this is only speculation. Only confirmed species are listed in the key.



Fig. 1 Distribution of zoogeographically interesting species of the genus *Veigaia* Oudemans, 1905

East European species (perhaps a Sibirian faunal element)

1. *V. sibirica* Bregetova, 1961
2. *V. igolkini* Bregetova, 1961

West European species (perhaps an Atlantic and Mediterranean faunal element)

3. *V. bouvieri* (Berlese, 1916)
4. *V. garraldensis* Athias-Henriot, 1961
5. *V. perinsolita* Athias-Henriot, 1961
6. *V. sanmamedi* Athias-Henriot, 1961

Central European species

7. *V. mollis* Karg, 1971
8. *V. leruthi* Willmann, 1935
9. *V. paradoxa* Willmann, 1951
10. *V. lauseggeri* Schmölzer, 1992
11. *V. inexpectata* Kaluz, 1993



**Key to the European mites of the genus *Veigaia* Oudemans**

1. Dorsal shield completely divided into two shields. 2  
 – Dorsal shield entire but with strong lateral incisions. 11
2. Peritremal shield fused with ventral shield. 3  
 – Peritremal shield not fused with ventral shield. 7
3. Large species (idiosoma over 1000 µm in length). 4  
 – Smaller species (less than 900 µm).....*V. mollis* Karg, 1971  
 (Median projection of tectum ending in a plume apically, lateral projections solid and oblique, pore plate near Coxa IV with max. 10 pores).
4. Podonotal shield with 2 setae, distinctly longer than other setae on this shield. ....  
 .....*V. kochi* Trägårdh, 1901  
 – Podonotal shield with 4 – 6 setae, distinctly longer than other setae on podonotal shield. 5
5. Podonotal shield with 4 setae, distinct longer than other setae on podonotal shield. Median projection of tectum ending in three tips, both lateral projections spiny, median projection toothed.....*V. lauseggeri* Schmölzer, 1992  
 – Podonotal shield with 6 setae, distinctly longer than other setae on podonotal shield. 6
6. Ventral shield completely fused with genital shield. Female with typical spiral organ, extending from solenostomae behind Coxa IV backwards as a double spiral, 1350 µm long. (Male of this species with spermatodactylus of same length).....  
 .....*V. paradoxa* Willmann, 1951  
 – Ventral shield fused with genital shield only lateral. Between both shields clefts with thin cuticula. Femal without spiral organ. (Male with spermatodactylus, only with double length of chelicera).....*V. propinqua* Willmann, 1936
7. Digitus fixus of chelicera serrately dentate. 8  
 – Digitus fixus of chelicera only with a pair of teeth. 9
8. Genital shield not fused with ventral shield. Ventral shield with 5 pairs of setae. ....  
 .....*V. planicola* Berlese, 1892  
 – Genital shield fused with ventral shield. Ventral part of ventrogenital shield with 4 pair of setae.....*V. sibirica* Bregetova, 1961
9. Median projection of tectum divided fishtail-like and with two triangular processes at the base. One pair of small presternal shields. 10  
 – Median projection of tectum divided fishtail-like and without triangular processes at the base. One pair of large presternal shields.....*V. igolkini* Bregetova, 1961
10. Anal shield always distinctly broader than long. Ventral shield with 3 pairs of setae. Back of ventral shield straight.....*V. nemorensis* (C. L. Koch, 1839)  
 – Anal shield always distinctly longer than broad. Ventral shield with 4 pairs of setae, back of ventral shield concave. ....*V. inexpectata* Kaluz, 1993
11. Anal shield with 3 setae. 12  
 – Anal shield with 5 setae. 14

12. Median projection of tectum divided fishtail-like. .... *V. transisalae* Oudemans, 1902  
 – Median projection of tectum of different shape. 13
13. Podonotal part of dorsal shield with 8 setae, which are distinctly longer than other setae on this shield. Median projection ending in an elongate apical plume. ....  
 ..... *V. cerva* (Kramer, 1876)  
 – Podonotal part of dorsal shield setae with similar length (only 4 setae are a little bit longer, but never three times longer than the rest). Median projection with teeth lengthwise. ....  
 ..... *V. sanmamedi* Athias-Henriot, 1961
14. Ventral shield separate, not fused with genital shield. .... *V. bouvieri* (Berlese, 1916)  
 – Ventral shield fused with genital shield. 15
15. Median projection at the end strongly divided. 16  
 – Median projection at the end never divided. 17
16. Divided end of median projection fishtail-like. ....  
 ..... *V. garraldensis* Athias-Henriot, 1961  
 – Divided end of median projection with multidentate crown. ....  
 ..... *V. perinsolita* Athias-Henriot, 1961
17. Species longer than 600  $\mu\text{m}$ . .... *V. leruthi* Willmann, 1935  
 – Species smaller than 500  $\mu\text{m}$ . 18
18. Median projection of tectum flask-like, with small bristles. At the basis with 2 triangular processes. Lateral processes of tectum very broad, at the end dentate. ....  
 ..... *V. exigua* (Berlese, 1916)  
 – Median projection of tectum flask-like, with small bristles. At the basis without triangular processes. Lateral processes of tectum narrow, at the end dentate. ....  
 ..... *V. agilis* (Berlese, 1916)

## 5. References

- ATHIAS-HENRIOT, C. (1961): Mesostigmates (Urop. excl.) Edaphiques Mediterraneens (Acaromorpha, Anactinotrichida). – *Acarologia* **3**: 381 – 509
- BŁASZAK, C. & R. EHRNSBERGER (2001): Beschreibung des Typusmaterials von *Veigaia paradoxa* Willmann, 1951 (Acari, Gamasida: Veigaiaidae). – *Osnabrücker Naturwissensch. Mitt.* **27**: 89 – 97
- , M. SKORUPSKI & R. EHRNSBERGER (2004): Die Milben in der Zoologischen Staatssammlung München. Teil. 6. Familie Veigaiaidae (Acari, Gamasida). – *Spixiana* **27** (2): 165 – 178
- BREGETOVA, N. G. (1961): Kľesci semeistva Veigaiaidae Oudemans, 1939. Fauna SSSR. – *Parasitol. Sbornik Zool. Inst. AN SSSR* **20**: 10 – 107 (in Russian)
- (1977): Veigaiaidae. In: GHILAROV M. S. & N. G. BREGETOVA (eds): Handbook for the identification of soil inhabiting mites (Mesostigmata). – Leningrad. Zool. Ins. Akad. Sci., USSR: 108 – 145 (in Russian)
- EVANS, G. O. (1955): British mites of the genus *Veigaia* Oudemans (Mesostigmata-Veigaiaidae). – *Proc. Zool. Soc. Lond.* **125**: 569 – 586
- FARRIER, M. H. (1957): A Revision of the Veigaiaidae (Acarina). – *N. Carol. Agric. Exp. Stn. Tech. Bul.* **124**, 103 pp.

- KARG, W. (1971): Acari (Acarina), Milben, Unterordnung Anactinochaeta (Parasitiformes). Die freilebenden Gamasina (Gamasides), Raubmilben. – Die Tierwelt Deutschlands 59. – Gustav Fischer Verlag, Jena, 475 pp.
- (1993): Acari (Acarina) Milben, Parasitiformes (Anactinochaeta) Cohors Gamasina Leach, Raubmilben. – Die Tierwelt Deutschlands 59, 2nd Edn, Gustav Fischer Verlag, Jena, Stuttgart, 523 pp.
- SCHMÖLZER, K. (1992): Neue Höhlenmilben aus Kärnten (Acarina, Parasitiformes). – Carinthia II, 182, 102 Jahrgang: 611 – 620
- (1995): Zwei neue, zoogeographisch interessante Milben aus Südosterreich. – Ber. nat.-med. Verein Innsbruck 82: 105 – 109
- SKORUPSKI, M. & P. GOŁOJUCH (1996): Roztocze (Acari, Mesosigmata) wybranych mikrośrodków Parku Narodowego Gór Stołowych. – Parki nar. Rez. Przyr. Białowieża 15 (3): 73 – 79
- & A. ŁABĘDZKI (2004): Mesostigmata mites in the Bielinek on the Odra reserve. – Abh. Ber. Naturkundemus. Görlitz 76 (1): 71 – 80
- WILLMANN, C. (1935): Exploration Biologique des Cavernes de la Belgique et du Limbourg hollandais. XXV. Acari. – Bull. Mus. roy. hist. nat. Belg. 11 (29): 1 – 41
- (1936): Mitteleuropäische Arten der Gattung *Veigaia* (Parasitidae, Acari). – Zool. Anz. 116: 249 – 258
- (1951): Über eigenartige Kopulationsorgane bei den Männchen der Gattung *Veigaia* (Acari). – Zool. Anz. 147: 85 – 91

Manuscript accepted: 1 June 2006

Authors' addresses:

Prof. Dr Czesław Błaszak  
Department of Animal Morphology, A. Mickiewicz University  
Umultowska 89  
61-614 Poznań, Poland  
e-mail: blaszak@main.amu.edu.pl

Prof. Dr Rainer Ehrnsberger  
Institut of Nature Conservation and Environmental Education, University of Vechta  
49364 Vechta, Germany  
e-mail: rainer.ehrnsberger@uni-vechta.de

Dr Maciej Skorupski  
Department of Forest and Environment Protection  
August Cieszkowski Agricultural University  
Wojska Polskiego 71c  
60-625 Poznań, Poland  
e-mail: maskorup@au.poznan.pl