

Piersigia koenikei new for the Dutch fauna and new Dutch records of *Piersigia intermedia* and *Vietsia scutata* (Acari: Hydrachnellae)

B. VAN MAANEN, D. TEMPELMAN & H. SMIT

MAANEN, B. VAN, D. TEMPELMAN & H. SMIT, 1997. *PIERSIGIA KOENIKEI* NEW FOR THE DUTCH FAUNA AND NEW DUTCH RECORDS OF *PIERSIGIA INTERMEDIA* AND *VIETSIA SCUTATA* (ACARI: HYDRACHNEL-LAE). – *ENT. BER., AMST.* 57 (8): 113-118.

Abstract: *Piersigia koenikei* is recorded for the first time for The Netherlands, and the occurrence of *Vietsia scutata* and *Piersigia intermedia* in The Netherlands is discussed. All known European records of these species are given and commented upon. Each of the three species is known from a very limited number of localities. This is probably due to the scarcity of research on temporary and semi-permanent waters.

B. van Maanen, Vakgroep Waterkwaliteitsbeheer en Aquatische Oecologie, Landbouwniversiteit Wageningen. Present address: Zuiveringschap Limburg, Afdeling Waterkwaliteitsbeheer, Postbus 314, 6040 AH Roermond, The Netherlands. D. Tempelman, AquaSense TEC, P.O. Box 95125, 1090 HC Amsterdam, The Netherlands. H. Smit, Emmastraat 43-a, 1814 DM Alkmaar, The Netherlands.

Introduction

In 1994 the first author carried out a typological and ecological study on the macro-invertebrates of railway ditches (Dutch: 'spoorbaansloten') between Elst and Geldermalsen (province of Gelderland, The Netherlands). Some of these ditches appeared to be of great faunistic value, notably those with a temporary or semi-permanent character, with a certain degree of hydrological isolation and with an abundance of helophytes (Van Maanen, 1995). In these ditches some rare water mites were encountered, among these *Piersigia koenikei* Viets, so far unrecorded from The Netherlands, and

Vietsia scutata (Protz) recorded here for the second time. A third interesting and rare species was *Piersigia intermedia* Williamson.

The water mites were collected by the first author, identified by the second author and checked by the third author. Specimens of all three species have been deposited in the collections of AquaSense TEC, Amsterdam and in the collection of the third author.

In this paper the locations where the three species were encountered are described. Coordinates are Amersfoort coordinates of the Dutch Topographical Survey. Furthermore, a synopsis is presented of all known records of the three species in Europe.

Table 1. Previous European records of *P. koenikei* outside The Netherlands. Abbreviations: D: Germany; UA: Ukraine; RM: Rumania; EIRE: Republic of Ireland

Date	Site and number	Habitat	Other water mites of temporary habitats	Reference
–	D, Oldenburg, Schierbrok-Nutzhorn, 1 ♀	forest pool with decomposing beech leaves		Viets, 1909; Viets, 1936
–	UA, Bukowina, Mihodra, near Berhomont am Sireth (formerly RM)	spring brook in pine forest, pH 6.6; temperature 8.5 °C		Husiatsinski, 1936b (as <i>P. botezati</i>)
–	EIRE, Killarney, Muckcross Demesne; idem, Ardagh Bog	two dikes	<i>Piersigia intermedia</i> <i>Vietsia scutata</i>	Halbert, 1944

Piersigia koenikei Viets

Viets described *Piersigia koenikei* in 1909. The species can be identified easily with Viets (1936), who described the species as an awkward, creeping water mite.

Three specimens of *P. koenikei* were collected on April 13, 1994 in core samples from a railway ditch near the Saneringsweg, north-east of Echteld (coordinates 164.5-436.7). The ditch, with a width of 5 m and a depth of 1 m, had a semi-permanent character and was unshaded. The water level was extremely high for the time of year (J. G. M. Cuppen, personal communication). The soil consisted of grey clay, covered by a thin layer of coarse organic matter. The vegetation, almost restricted to the banks of the ditch, consisted of helophytes, mainly *Galium palustre* L., *Carex acuta* L., *Glyceria maxima* (Hartm.) Holmb. and *Mentha aquatica* L. Floating and submersed vegetation was scarce and consisted of *Lemna minor* L., *Lemna trisulca* L. and *Riccia fluitans* L. The water was clear and had a relatively low hardness (6 °D), a low chloride level (13.1 mg/l) and a low conductivity (196 µS/cm). These characteristics indicate that the ditch is

relatively little influenced by pollution nor by intake of Rhine water. This agrees with the hydrological isolation of the ditch, as compared to polder ditches with an important drainage function (Van Maanen, 1995).

Other species of interest found here were *Piersigia intermedia* (discussed below), as well as *Arrenurus truncatellus* (Müller), *Hydryphantes crassipalpis* Koenike, *Pionacercus norvegicus* Thor, *Thyas pachystoma* Koenike and *Tiphys pistillifer* (Koenike). All these species are rare in The Netherlands, and can be found in temporary and semi-aquatic habitats, like quagfens and terrestrializing ditches (Smit & Van der Hammen, 1996).

Only four other records of *Piersigia koenikei* (table 1), from three countries, are known to us. Viets (1909, 1936) mentions the species from a shallow forest pool in Germany, where the holotype was collected between decomposing beech leaves. Other records are from a spring stream in the formerly Rumanian part of Bukowina, nowadays part of Ukraine (as *P. botezati* Husiatinschi, Husiatinschi, 1936b) and from two sites in Killarney, Ireland, in dikes in a bog area, where it was accompanied by *P. intermedia* (Halbert, 1944). This is the least known of the three species treated in this article, it is extremely rare in Europe.

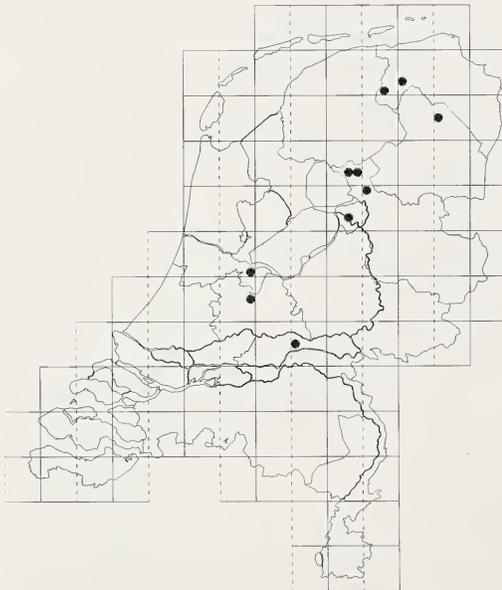


Fig. 1. Distribution of *Piersigia intermedia* in The Netherlands.

Piersigia intermedia Williamson

This species has been recently reported as new for the Dutch fauna (Smit & Van der Hammen, 1990). These authors reported the species from a brook in the province of Drenthe, and from a former river branch in the province of Overijssel. Meanwhile, 16 Dutch records have become known, including turbaries, flooded reedlands, terrestrializing ditches and quagfens (Smit & Van der Hammen, 1996). For all known Dutch records see figure 1. In the railway ditches in the Betuwe the species was found on the same date and location as *Piersigia koenikei*.

Within Europe, this species is known from England, Ireland, Germany, Poland, Ukraine, Russia and Sweden (table 2). Outside Europe, this species occurs in the United States

Table 2. Previous European records of *P. intermedia* outside The Netherlands. Abbreviations: RU: Russia; S: Sweden; GB: Great Britain; PL: Poland; see also table 1.

Date	Site and number	Habitat	Other water mites of temporary habitats	Reference
1899	RU, Kaliningrad (= Koeningsbergen, Prussia)			Viets, 1913 (as <i>P. limnophila</i>)
1902	GB, Lincolnshire, Manton, 1 ♀			Williamson, 1912
1905	GB, Norfolk Broads 1 ♀			Williamson, 1912
7.vi.1931 and 12.vi.1932	S, Uppland, Skenora, 1 ♀ resp. 1 ♂ and 1 ♀	"Erlenbruch", pool with <i>Sphagnum</i> and <i>Carex</i>	<i>Thyas barbiger</i> , <i>T. pachystoma</i> <i>Zschokkea oblonga</i> , <i>Oxus nodigerus</i> , <i>Tiphys ensifer</i> , <i>T. scaurus</i> , <i>Pionacercus norvegicus</i> , <i>Arrenurus mediorotundatus</i> , <i>A. truncatellus</i>	Lundblad, 1962
22.x.1935	UA, Tshernovtsy (= RM, Bukowina, Cernăuți, Bila), 3 ♀	perennial pond with many mosses		Husiatinschi, 1936a
30.x.1935	UA, Tshernovtsy (= RM, Bukowina, Cernăuți, Tețina) 1 ♂ and 1 ♀	large pond, fed with seepage water, in beech forest		Husiatinschi, 1936a
2.xi.1935	UA, Tshernovtsy (= RM, Bukowina, Revna), 3 ♀	peat bog with <i>Sphagnum</i> and other mosses		Husiatinschi, 1936a
11.v.1936	S, Smaland, Hallsjöy, 1 specimen	temporary forest pool with <i>Sphagnum</i>	<i>Euthyas truncata</i> , <i>Thyas barbiger</i>	Lundblad, 1962
19.x.1936	UA, Bukowina, Mihodra, near Berhoment am Sireth (formerly RM)	deep seepage pool in fir forest in moorland. T. 8.5 °C	<i>Pionacercus leuckarti</i> , <i>Thyas rivalis</i>	Husiatinschi, 1937
–	EIRE, Killarney, Muckcross Demesne, > 40 specimens	dike in bog area	<i>Piersigia koenikei</i> , <i>Vietsia scutata</i>	Halbert, 1944
14.iv. and 1.v.1953	S, Upsala-Näs, 1 ♂; S, Uppland, Lurbo, 2 specimens	temporary forest pool with <i>Sphagnum</i> ; grass covered ditch	<i>Thyas barbiger</i> , <i>T. ensifer</i> , <i>T. scaurus</i> , <i>Zschokkea oblonga</i> , <i>Arrenurus mediorotundatus</i> , <i>A. truncatellus</i>	Lundblad, 1962
16.ii.1962 and May 1962	D, Mecklenburg, river Müritz, 2 sites, 1 resp. 3 specimens	clay pit; ditch in bog area with poor vegetation (<i>Lemna minor</i>). Both dystrophic with much detritus	<i>Thyas pachystoma</i> , <i>Arrenurus truncatellus</i> , <i>Euthyas truncata</i>	Schieferdecker, 1966
1970-1973	PL, Konin Lake area, Lake Mikorzyńskie, 7 specimens	lake	<i>Euthyas truncata</i> , <i>Tiphys ensifer</i> , <i>Piona clavicornis</i> , <i>Arrenurus truncatellus</i>	Biesiadka, 1977
30.iv.1974	RU, Jaroslavl			Wainstein, 1978
iv-x.1982	PL, Poznan, Gniezno lake district, Lake Debiniec and Lake Drazynek, 3 specimens	small lakes; both eutrophic. Vegetation: <i>Caricetum</i> , <i>Sphagnetum</i> and mosses	<i>Arrenurus truncatellus</i>	Zawal, 1992
19.iii-v.1984	D, Schleswig-Holstein, Kiel	Two forest pools, pH 6.5-6.6; EGV 141-182, hardness 3.4; alkalinity 0.9-1.0.; T. 2 °C (19.iii.1984). One pond with <i>Lemna minor</i> and <i>Riccia fluitans</i> ; the other devoid of vegetation		Böttger & Völkl, 1987

(Habeeb, 1953, cited in Lundblad, 1962; Imamura & Mitchell, 1967). The species has been reported from small eutrophic lakes in Poland (Zawal, 1992), from forest pools and limno-crene springs in Rumania (Husiatinski 1936a, 1937) and from ditches and bog areas in Ireland (Halbert, 1944). Some localities are considered eutrophic, others dystrophic. The acidity varies around pH 6.5. Several authors report low water temperatures. The majority of the sites is semi-permanent, although several records seem to originate from permanent waters as clay pits, former river branches and lakes. Most records are from April to June and from September to October, but some specimens were even caught in February and November.

Piersigia intermedia is clearly the most common one of the three species treated in this paper.

Vietsia scutata (Protz)

This species is reported as new for the Dutch fauna by Smit & Van der Hammen (1996). It was found in a quagfen on April 22, 1994 in the Weerribben (province of Overijssel).

We report here three other records for The Netherlands. The second record was made by the first author who found three specimens of *V. scutata* in core samples on April 13, 1994 from a railway ditch near the Saneringsweg,

northeast of Echteld (coordinates 163.6-436.3). The location is one km west of the locality where both *Piersigia*'s were found. This temporary ditch with a width of 3 m and a depth of 0.45 m was slightly shaded by high poplars. The soil consisted of grey clay, covered by a thin layer of coarse organic matter. The vegetation consisted of helophytes only and was dominated by *Phragmites australis* (Cav.) Steud. (coverage 50%). *Iris pseudacorus* L. and *Carex acuta* occurred with low coverage percentages. The water was clear and less eutrophic than ditches in the area, which have a drainage function (Van Maanen, 1995). This is apparent by the lower concentrations of chloride (30.3 mg/l), sulfate (1.2 mg/l) and sodium (14.7 mg/l) and by the lower conductivity (348 μ S/cm).

The ditch was poor in water mite species; all species are typical for temporary waters, e.g. *Piona clavicornis* (Müller). The other invertebrate species are all quite common; the most remarkable was the large number of scirtid larvae, i.e. *Cyphon* Paykull (329 specimens) and *Microcara testacea* Linnaeus (279 specimens).

The third record of *Vietsia scutata* from The Netherlands very recently got known: H.P.J.J. Cuppen captured one specimen on 21 April 1996 in a temporary ditch in the IJsselvallei near Klein-Amsterdam, municipality of Voorst (province of Gelderland) (coor-

Table 3. Previous European records of *Vietsia scutata* outside The Netherlands. Abbreviations: see table 1 and 2.

Data	Site and number	Habitat	Other water mites of temporary habitats	Reference
23.iv.1915	S, Uppland, Börjevågen	grass covered ditch	<i>Euthyas truncata</i> , <i>Thyas barbiger</i> , <i>Hydryphantes ruber</i>	Lundblad, 1962
iv.1919	D, Berlin, Köpenick Wendenschloß	marsh		Viets, 1936
–	D, Rügen, Sasnitz, Rusewase	warm depression at the source of a stream		Viets, 1936
–	D, Schlesien, Paulauer Bach, Brieg	brook		Viets, 1936
–	D, Bremen, Lesum	flooded meadow and reedland ditch		Viets, 1936
–	EIRE, Killarney, Muckcross Demesne, 145	shallow dike in bog area	<i>Piersigia intermedia</i> , <i>P. koenikei</i>	Halbert, 1944
22.iii.1962	D, Mecklenburg, Großen Bruch	ditch in peaty <i>Carex</i> -marsh	<i>Euthyas truncata</i> , <i>Thyas rivalis</i> , <i>Neumania spinipes</i>	Schieferdecker, 1966

dinates 203-462). The vegetation here consisted of *Carex elata* All. and *Calamagrostis canescens* (Weber) Roth. The location is a temporary habitat, desiccating each year in summer and filling with clear seepage water in winter and spring. Some other quite rare water mite species of temporary habitats were encountered here, e.g. *Thyas dirempta* Koenike, *Euthyas truncata* (Neuman) and *Piona clavicornis*. Further, the locality is of coleopterological importance because of the occurrence of the dytiscids *Hydroporus glabriusculus* Aubé and *Hydroporus notatus* Sturm (H.P.J.J. Cuppen, personal communication).

The fourth record originates from a ditch at the Bennekomse Meent, a fenland (Dutch: "blauwgrasland"), in the municipality of Ede (province of Gelderland) (coordinates 169-446). One specimen was captured here by M. Koopmans on 24 April 1996. Here also a typical fauna of temporary habitats was found, e.g. *Piona clavicornis* and *Piona nodata laminata* (Thor) (H.P.J.J. Cuppen, personal communication).

Outside The Netherlands *V. scutata* is known from seven localities, in Germany, Sweden and Ireland (table 3). Viets (1936) mentions the species from a marsh, a flooded meadow with *Phragmites*, a brook, and a warm depression at the source of a brook ("warme Senke zur Beginn des Baches"). Lundblad (1962) reports the species from a grass covered ditch. Halbert (1944) mentions 145 specimens (!) from a shallow dike in a bog area and, finally, Schieferdecker (1966) reports it from a ditch. All known observations are from March and April.

Discussion

Piersigia intermedia, *P. koenikei* and *V. scutata* are rare species, in The Netherlands as well as in Europe. In The Netherlands, they occur mainly in temporary and semi-aquatic habitats. Possibly, they were not found earlier due to the few studies on macro-invertebrates in these habitats. The increasing number of records of *P. intermedia* and *V. scutata* may

point this out. Apart from this, temporary habitats have become rare in The Netherlands due to drainage; this may also apply to the surrounding countries (Böttger & Völkl, 1987).

All three species seem characteristic for temporary viz. semi-permanent habitats and, in several cases, are found together, often with several accompanying rare water mites of temporary habitats. Further research on these habitats will undoubtedly reveal more localities, making possible a better understanding of the ecology of these species.

Acknowledgements

The authors are indebted to Drs J.G.M. Cuppen, for his help during the field research; to Drs H.P.J.J. Cuppen, who kindly provided interesting additional information on *V. scutata* from the Netherlands; to P. Frigge, who is thanked for his help in preparing the STIPT-map of *P. intermedia*; to Dr T. Gledhill, who has kindly provided us with some literature and to M. Koopmans of Zuiveringsschap Veluwe, who granted us permission to publish the fourth record of *V. scutata*. We are very grateful to all of them.

References

- BIESIADKA, E., 1977. XII. Hydracarina. In: Bottom fauna of the heated Konin Lakes (A. Wróblewski, ed.). – *Monogr. Fauny Polski* 7: 281-350.
- BÖTTGER, K. & R. VÖLKL, 1987. Faunistisch-ökologische Beobachtungen an den Wassermilben (Hydrachnellae, Acari) einiger Kleingewässer, nebst biologischen Angaben zu einzelnen Arten. – *Acarologia* 28: 161-170.
- HALBERT, J.N., 1944. List of Irish fresh-water mites (Hydracarina). – *Proc. Irish Acad.* 50: 39-104.
- HUSIATINSCHI, A., 1936a. Zur Kenntnis des Männchens von *Piersigia intermedia* Williamson (Hydrac.). – *Zool. Anz.* 113: 331-334.
- HUSIATINSCHI, A., 1936b. Eine neue Hydracarinaart der Gattung *Piersigia* Protz aus der Bukowina (Rumänien). – *Zool. Anz.* 115: 171-174.
- HUSIATINSCHI, A., 1937. *Piersigia wassilkoi*, eine neue Hydracarinaart aus der Bukowina (Rumänien), nebst Bemerkungen über die Ökologie der *Piersigia*-Arten im Hochmoorgebiet der Mihodra. – *Zool. Anz.* 117: 133-136.
- IMAMURA, T. & R. MITCHELL, 1967. The ecology and life history of the water mite, *Piersigia limnophila* Protz. – *Ann. Entomol. Soc. Jap.* 40: 37-44.
- LUNDBLAD, O., 1962. Die Hydracarina Schwedens. II. – *Ark. Zool.* 14: 1-635.
- MAANEN, B. VAN, 1995. *Spoorsloten in de Betuwe. Een oecologische beoordeling en typologie op basis van macrofauna*. – Doctoraalverslag 035/95: 1-74 en 9 bijlagen. Landbouwuniversiteit, Wageningen.

- SCHIEFERDECKER, H., 1966. Die Hydrachnellae des Naturschutzgebietes "Ostufer der Müritz" in Mecklenburg (Eine ökologische Untersuchung). – *Beitr. Ent.* 16: 721-758.
- SMIT, H. & H. VAN DER HAMMEN, 1990. Nieuwe watermijten voor de Nederlandse fauna (Acari: Hydrachnellae). – *Ent. Ber., Amst.* 50: 93-96.
- SMIT, H. & H. VAN DER HAMMEN, 1996. A remarkable assemblage of water mites in quagfens and carr in The Netherlands (Acari: Hydrachnellae). – *Ent. Ber., Amst.* 56 (2): 28-32.
- VIETS, K., 1909. Weitere hydrachnologische Beiträge. – *Abh. naturw. Ver. Bremen* 19: 453-476.
- VIETS, K., 1913. Hydrocarinologische Beiträge. VI. Ueber einige seltene Hydracarinen. – *Abh. naturw. Ver. Bremen* 21: 389-411.
- VIETS, K., 1936. Wassermilben oder Hydracarina (Hydrachnellae und Halacaridae). – *Tierwelt Dtl.* 31: 1-288; 2: 289-574.
- WAINSTEIN, A., 1978. Novoe dlja fauny SSSR semjstwo wodjanych klesjstsej Piersigiidae Oudemans, 1902 (Acariformes). – *Biol. Vnutrenn. Vod; Inform. Bjull.* 39: 57.
- WILLIAMSON, A., 1912. Description of a new species of Hydracarina - Piersigia intermedia. – *Proc. Phys. Soc.* 18: 251-254.
- ZAWAL, A., 1992. Water mites (Hydracarina) of three small lakes in the neighbourhood of Poznan. – *Acta Hydrobiol.* 34 (1/2): 157-174. Kraków.

Accepted 17.ii.1997.