

# NEW RECORDS OF RARE WATER MITES FROM THE NETHERLANDS

## (ACARI: HYDRACHNIDIA)

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The recently published atlas of water mites from the Netherlands has stimulated people to study this group of aquatic invertebrates. In the short period after publication of the atlas, five new species for the Netherlands were found. Moreover, five species were found which had not been reported from the Netherlands since several decades and new records of quite a few rare and very rare species were collected. These new records can only partly be attributed to the enhanced interest in water mites. Several of the rare species reported here were found in streams that have been studied extensively in the period 1990-2000 or even have been monitored over a long period.

As most of the interesting records originate from streams, a very tentative conclusion could be that the water quality, in its broadest sense, is improving. However, the quality is still not at the same level as in the past. Species of some genera, like *Aturus*, used to be very abundant in the past, but they are still rare.

### INTRODUCTION

Recently, the atlas of the Dutch water mites was published, with all records of water mites known at the time (Smit & Van der Hammen 2000). Since its publication, a number of new records of rare and very rare species have been collected, including five species new for the Dutch fauna. A number of older specimens not recorded before are also included in this paper. Moreover, the previously recorded material of *Piersigia koenikei* was re-examined, as all recently collected specimens initially assigned to this species turned out to be nymphs of *P. intermedia*. The first record of *Arrenurus nielsenii* since its original publication allows us to redescribe this species. With the five new species for the Dutch fauna published in this paper, and deleting *P. koenikei* from the Dutch list, 238 species of water mites are now known from the Netherlands.

### MATERIAL AND METHODS

Most records are from water quality monitoring programmes and other ecological research by waterboards and research institutes. The co-ordina-

tes given below are the so-called Amersfoort coordinates of the Dutch Topographical Survey. The distribution maps are based on a 5 km grid of the Dutch Topographical Survey. The following abbreviations are used for the depositories of material: SMF = Forschungsinstitut Senckenberg, Frankfurt am Main; ZMAN = Zoological Museum University of Amsterdam; ZL = Zuiveringschap Limburg; BM = B. van Maanen (Roermond). Other abbreviations used: PII = second segment of the palp, EC = electrical conductivity. For the description of the glandularia Jin & Wiles (1996) and Wiles (1997) are followed. All measurements are in  $\mu\text{m}$ , measurements of leg and palp segments are of the dorsal margins.

### SPECIES ACCOUNTS

#### *Piersigia intermedia* Williamson, 1912 (fig. 1)

Province of Limburg: 2 adults, Turfkoelen, Herkenbosch (co-ordinates 204.II-351.39), 4.VII.2001; 1 adult, 1 nymph, oxbow pond of Roer, Herkenbosch (co-ordinates 201.15-351.41), 17.VI.2002; 3 adults, 5 nymphs, De Muytert (oxbow pond of Roer), Herkenbosch (co-ordinates 201.35-351.65),

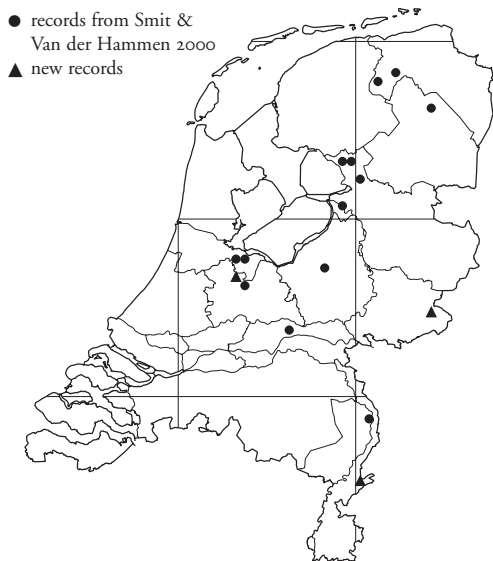


Figure 1  
Distribution of *Piersigia intermedia*.  
Figuur 1  
Verspreiding van *Piersigia intermedia*.

28.IV.2002; 2 adults, 1 nymph, same location, 1.VI.2002; 8 adults, *Alnus carr* with *Sparganium*, Broekhuizer Schuitwater, Broekhuizen (co-ordinates 206.41-387.23), 4.V.2002; 7 adults, *Alnus carr* with *Carex*, Broekhuizer Schuitwater, Broekhuizen (co-ordinates 206.44-387.31), 4.V.2002. Province of Gelderland: 1 adult, peat bog with *Sphagnum* and *Myrica gale*, Meddosche Veen, Winterswijk (co-ordinates 242.74-445.33), 15.III.2002; 4 adults, semi-permanent railway ditch, Echteld (co-ordinates 164.56-436.72), 3.V.2002. Province of Noord-Holland: 1 adult, ditch Het Hol, Kortenhoeve (co-ordinates 134.71-469.94), 20.X.1999. Province of Overijssel: 4 adults, temporary ditch with *Phragmites*, Schut and Grafkampen, Ossenzijl (co-ordinates 190.28-534.30), 1.XI.2001; 1 adult, temporary pools in reedland, Schut and Grafkampen, Ossenzijl (co-ordinates 190.42-533.70), 1.XI.2001; 1 adult, 1 nymph, bog near De Kragge, Ossenzijl (co-ordinates 191.77-534.20), 2.XI.2001; 3 adults, temporary pools in reedland, Woldackers, Oldemarkt (co-ordinates 195.51-534.47), 2.XI.2001.

Van Maanen et al. (1997) reported *Piersigia koenikei* Viets, 1909 for the first time for the Netherlands. Re-examination of the specimens revealed that all were nymphs. Based on the shape of the provisional genital field and the short palps, they were identified as *P. koenikei*. Since then, similar nymphs have been found at a number of other locations. Remarkably, they were always accompanied by adults of *P. intermedia*. This might suggest that *P. koenikei* is the nymph of *P. intermedia*. However, examination of the holotype of *P. koenikei* (slide 665, SMF) has revealed that this is an adult female, with a distinct gonopore. The only illustration of a nymph of *P. intermedia* is given by Lundblad (1962), and agrees well with our specimens. Therefore, we conclude that the record of Van Maanen et al. (1997) refers to *P. intermedia*, and *P. koenikei* must be deleted from the Dutch list. No description is known of the nymph of *P. koenikei*. The only other *Piersigia* species of which the nymph has been described is *P. limophila* Protz, 1896. Compared to the adult, the nymph of *P. limophila* also has short palps, somewhat trapezoid sclerites between the anterior and posterior genital plates and a reduced number of acetabula (Imamura & Mitchell 1967). The same phenomenon can be found in *P. intermedia*. The habitat preference of *P. intermedia* was reviewed by Smit & Van der Hammen (2000). The additional records show the frequent occurrence in oxbow ponds with well-developed terrestrialization vegetations, often consisting of *Carex* species. In most cases there is hardly any influence of river water by flooding and the water quality is improved by seepage. *Piersigia intermedia* is difficult to collect because of its presence in the transition zone between land and water, which is mostly covered with dense helophyte vegetation and coarse organic material. Vigorously trampling and submerging the vegetation and other organic material facilitates the collection of this species, and has resulted in many new records. Contrary to most water mites, this species does not readily leave the sampled material in a tray with water, and therefore the sample has to be sifted. The red colour of the species facilitates its detection,

although the nymphs are less distinctly coloured. The described collecting method is suitable for most crawling mites in temporary habitats.

***Piersigia limophila* Protz, 1896**

Province of Zuid-Holland: 1 adult, Stormpolder, Krimpen a/d IJssel, (co-ordinates 99.729-435.54), 17.X.2002.

This species was only known from the province of Noord-Holland, where it was found in puddles in reed lands bordering large waters and canals. The new record is a tidal forest, which is flooded six hours every day.

***Thyopsis cancellata* (Protz, 1896)**

Province of Gelderland: 1 adult, Waterloop (a seepage ditch), Neede, Achterhoek (co-ordinates 242.II-463.95), 9.IV.2002. Province of Overijssel: 2 adults, Luttermolenbeek 't Theussink, De Lutte, Twente (co-ordinates 266.35-480.58), 2.XII.1994; 1 adult, Poelbeek, upper course, Wittebergweg, Nutter, Twente (co-ordinates 257.85-493.65), 16.VI.1998.

Previously known from seven recent records, all but one from the province of Noord-Holland.

***Panisopsis vigilans* (Piersig, 1896)**

Province of Limburg: 1 ♂, 1 ♀, small seepage puddle along Nartheciumbeekje, Vlodrop-Station, Meinweg (co-ordinates 207.93-351.38), 31.V.2002; 10 ♂ + ♀, 1 nymph, spring Maalbeek/Aalsbeek, Maalbekerhöhe, Belfeld (co-ordinates 208.01-368.59), 16.XI.2002; 6 adults, same location, 13.X.2000; 6 adults, spring zone, Weustenrade, Voerendaal (co-ordinates 192.72-323.88), 10.VII.2002; 4 adults, 1 nymph, Elfenmeer, Meinweg, Herkenbosch (co-ordinates 206.77-354.90), 28.V.1997.

Until recently, the species was only reported from moorland pools in the province of Drenthe (Smit & Van der Hammen 2000). Four records were known from the past, i.e. Rheden, Woudenberg, Brunssum and Herkenbosch (Davids 1979). One of the new records is also from a moorland pool,

where it was collected in marsh plant floatants with *Sphagnum* and *Myrica gale*. Maybe the presence of seepage water or some other kind of buffering is relevant for the occurrence in moorland pools, since the species seems to be absent in most of the Dutch moorland habitats with an abundance of *Sphagnum*. The other three records are from small spring streams. The Maalbeek and Nartheciumbeek are bordered with a dense vegetation of *Sphagnum* and are rather acidic (mean pH respectively: 5.8 and 6.4). The strong association of *P. vigilans* with *Sphagnum* is well known (e.g., Lundblad 1968, Smit & Van der Hammen 2000). It is therefore remarkable that the third location concerns a summer warm spring or seepage zone without *Sphagnum*, though other mosses were present. The water quality is very different as well: the water is calcareous and not acidic, with mean chemical values for pH of 7.9, an EC of 695 µS/cm and a calcium content of 2.68 mmol/l. The assumption of Viets (1936) that the absence of calcium could be an important factor for the presence of *P. vigilans* seems untenable. Possibly the occurrence in the Netherlands is somewhat underestimated, because of its hidden way of life in moss cushions where it is difficult to catch. Anyhow, the suitable habitat remains rare in the Netherlands.

***Protzia eximia* (Protz, 1896)**

Province of Limburg: 8 adults, Belletterbeek, Cottessen (co-ordinates 193.53-308.27), 26.XI.2000; 10 adults, Berversbergbeek, Cottessen (co-ordinates 194.28-308.32), 26.XI.2000; 4 adults, same location, 27.IV.2000; 1 adult; Hermansbeek, Holset (co-ordinates 196.99-309.82), 27.IV.2000; 1 adult, Klitserbeek, Bommerig (co-ordinates 193.10-309.82), 8.V.2000; 2 adults, same location, 17.I.2003; 9 adults, Mechelderbeek, Mechelen (co-ordinates 192.73-311.80), 1.V.2000; 1 adult, same location, 17.I.2003.

Smit & Van der Hammen (2000) reported only two recent records, all in the province of Limburg. Most of the streams from which the species is recently found have also been examined in the

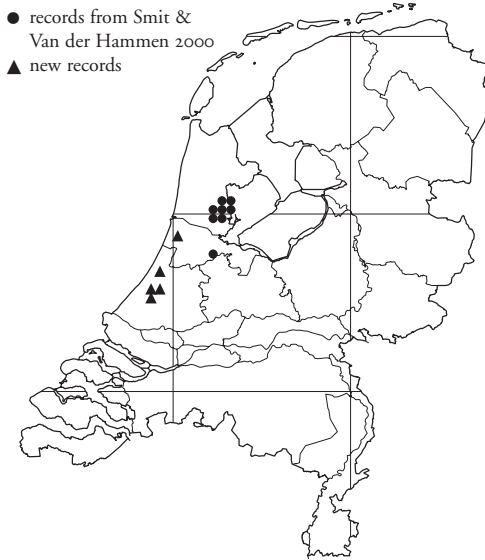


Figure 2  
Distribution of *Diplodontus scapularis*.  
Figuur 2  
Verspreiding van *Diplodontus scapularis*.

1990s. Therefore, we can conclude that *P. eximia* is becoming more common. All but one records were from coarse mineral habitats, the record from the Klitserbeek was from a coarse organic habitat. All streams are located in the hills of Zuid-Limburg and have a calcareous water quality.

#### *Tartarothyas romanica* Husiatinschi, 1937

Province of Limburg: 1 adult, Turfkoelen, Herkenbosch (co-ordinates 204.11-351.39), 4.VII.2001; 1 adult, *Alnus* carr with *Carex*, Broekhuizer Schuitwater, Broekhuizen (co-ordinates 206.44-387.31), 4.V.2002. Province of Overijssel: 2 adults, Kloppersblok carr-area, Weerselo, Twente (co-ordinates 255.53-483.93), 14.XI.2000; 1 adult, Hazelbeek northern upper course Hazelbekke, Nutter, Twente (co-ordinates 255.18-494.25), 19.X.1999.

Smit & Van der Hammen (2000) reported the species from the provinces of Overijssel, Noord-Brabant en Limburg.

#### *Diplodontus scapularis* Dugès, 1834 (fig. 2)

Province of Zuid-Holland: 1 adult, ditch Zoetermeerse Meerpolder, Zoetermeer (co-ordinates 92.240-455.640), 29.VI.1992; 1 adult, ditch Duivenvoordse-Veenzijdse Polder, Leidschendam (co-ordinates 87.233-458.314), 24.V.1994; 1 ♀, same location, 6.VI.2002; 1 ♀, ditch near monastery Alverna, Heemstede (co-ordinates 101.480-485.700), 20.VI.1994; 8 adults, ditch Gecom-bineerde Starrevaart- en Damhouderpolder, Leidschendam (co-ordinates 89.300-455.650), 15.VI.1998; 5 adults, ditch Nieuwe Driemanspolder, Leidschendam (co-ordinates 89.100-453.980), 22.VI.1998; 1 ♂, ditch Polder Elsgeest, Warmond (co-ordinates 92.970-468.930), 14.VI.1999.

Previously, the species had a limited distribution in the Netherlands. It was only found in the province of Noord-Holland, with its main distribution just north of Amsterdam. It has now spread over the province of Zuid-Holland.

#### *Sperchonopsis verrucosa* (Protz, 1896)

Province of Gelderland: 11 adults, Stortelersbeek, Miste, Winterswijk (co-ordinates 244.07-439.41), 15.III.2002.

Smit & Van der Hammen (2000) reported the species from two localities, the Willinkbeek and the Ratumse Beek, like the above record also in the Achterhoek. The Stortelersbeek is a shaded lowland stream, with mainly sandy substrates, some coarse organic material and roots of trees.

#### *Sperchon compactilis* Koenike, 1911

Province of Gelderland: 2 adults, Hoge Oorsprong, Heveadorp, Oosterbeek (co-ordinates 185.18-443.34), 19.IV.2000; 2 adults, spring brook Hemelseberg Oosterbeek (co-ordinates 185.63-443.41), 17.IV.2000; 13 adults, Zweiersdal Oosterbeek (co-ordinates 186.05-443.64), 18.X.2000; 3 adults, same location, 17.IV.2000.

Remarks: Previously, this species was collected only in the province of Limburg.

***Sperchon denticulatus* Koenike, 1895**

Province of Gelderland: 13 adults, Zweiersdal, Oosterbeek (co-ordinates 186.05-443.65), 18.x.2000.

This species was only known from the province of Limburg and a few records from Twente and the Achterhoek.

***Sperchon longissimus* Viets, 1920**

Province of Limburg: 1 adult, Terzieterbeek, Terziet (196.99-309.82), 26.iv.2000; 1 ♀, springs Buizenweg, St. Jansberg (co-ordinates 193.24-416.82), 18.iii.1996; 3 ♀, Jammerdal spring, Jammerdaalse Heide (co-ordinates 209.41-375.55), 19.iii.1996.

Remarks: Smit & Van der Hammen (2000) recorded the species from two localities: the Klitserbeek in the province of Limburg and the Filosofenbeek near Nijmegen in the province of Gelderland.

***Lebertia fimbriata* Thor, 1899**

Province of Overijssel: 12 adults, Ruenbergerbeek, Welpelweg, Twente (co-ordinates 267.76-474.2), 1.xi.1998; 9 adults, same location, 9.xi.1999; 28 adults, same location, 23.x.2000; 10 adults, same location, 22.x.2001; 14 adults, same location, 23.x.2001; 1 adult, Hazelbeek northern upper course, Hazelbekke, Ootmarsum, Twente (co-ordinates 255.18-494.25), 19.x.1999.

Previously, this species was only recorded from the eastern side of the Veluwe, and from helocrenes and streams in the province of Limburg.

***Lebertia rivulorum* Viets, 1933**

Province of Limburg: 8 adults, Vlootbeek, Linne (co-ordinates 193.63-352.49), 11.vi.2001; 1 adult, Lingsforterbeek, Lingsfort (co-ordinates 212.26-387.74), 22.v.2001; 2 adults, Lingsforterbeek, Arcen (co-ordinates 210.31-387.31), 22.v.2001. Province of Overijssel: 2 adults, Mosbeek, Doevenweg/Lemscheweg, Twente (co-ordinates 249.3-494.6), 15.x.2002.

Smit & Van der Hammen (2000) reported the species from the southern part of the province of

Limburg, and from Twente (province of Overijssel) and the Achterhoek (province of Gelderland). New records are presented here from the central and northern part of the province of Limburg, where the species occurs in streams in the Meuse terrace landscape. Several new records from the south of Limburg are not included, because the species is not rare in that region.

***Lebertia sefvei sefvei* Walter, 1911 (fig. 3)**

Province of Limburg: 9 ♀, spring Maalbeek/Aalsbeek, Maalbekerhöhe, Belfeld (co-ordinates 208.01-368.59), 17.v.1995 (ZL). At the same locality: 4 ♀, 21.v.1997 (ZL); 9 ♂, 46 ♂, 16.xi.2002 (ZL, ZMAN).

The species is new for the Dutch fauna. It was found in a cold spring with *Sphagnum*, shaded by *Salix* bushes. The water is acidic with a mean pH of 5.8 and a mean EC of 340 µS/cm. This is in accordance with the known preference for slightly acidic habitats (Lundblad 1968). The species was also present in the adjacent spring brook. Lundblad (1968) considered *Lebertia sefvei sefvei* a cold stenothermic species that is not confined to springs and that has its main distribution in mountain areas. In the lowland it is possibly restricted to springs and appears to be rare. The accompanying species were *Lebertia stigmatifera* Thor, 1900, *Atractides tener tener*, *Panisopsis vigilans*, *Sperchon squamosus* Kramer, 1879 and *Sperchon glandulosus thienemanni*. *Lebertia sefvei sefvei* has a western Palearctic distribution, and is widespread in Europe. The species often occurs in low densities (Lundblad 1968). Due to intensive collecting activities in search for males we collected many specimens.

***Torrenticola amplexa* (Koenike, 1908) (fig. 4)**

Province of Drenthe: 27 adults, Westerdiep, Tynaarlo (co-ordinates 239.48-567.09), 2.iv.2002; 8 adults, Oude Molense Diep, Oude Molen (co-ordinates 239.50-563.20), 5.xi.2000. Province of Noord-Brabant: 3 adults, Reusel, Hilvarenbeek (co-ordinates 139.50-383.15), 1.v.2000; 6 ♂, 7 ♀, Beerze, Boxtel (co-ordinates 146.81-396.09), 15.vi.2002; 1 ♂, Beerze, Boxtel (co-ordinates



Figure 3  
Distribution of *Lebertia sefvei sefvei*.  
Figuur 3  
Verspreiding van *Lebertia sefvei sefvei*.

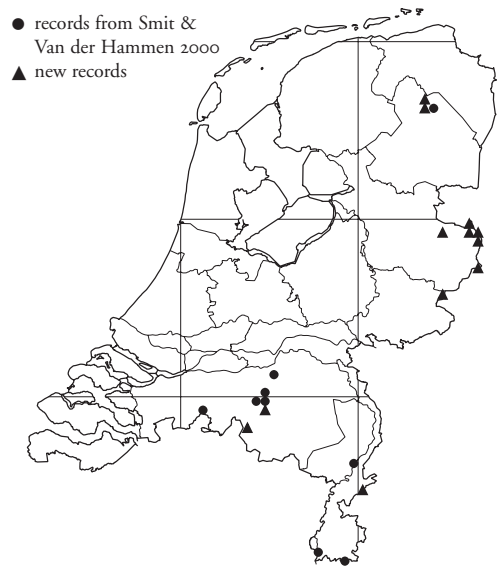


Figure 4  
Distribution of *Torrenicola amplexa*.  
Figuur 4  
Verspreiding van *Torrenicola amplexa*.

146.44-394.93), 15.vi.2002. Province of Overijssel: 31 adults, Benedendinkel, Ottershagenweg, Lattrop, Denekamp, Twente (co-ordinates 261.98-494.00), 30.x.2001; 2 adults, Dinkelkanaal, Brookmanweg, Lattrop, Denekamp, Twente (co-ordinates 262.93-497.48), 16.x.2001; 2 adults, Puntbeek Lutterzand near border, De Lutte, Losser, Twente (co-ordinates 268.61-485.12), 20.xi.2001; 4 adults, Rammelbeek, Grensweg, Denekamp, Twente (co-ordinates 268.65-491.13), 20.xi.2001; 2 adults, Ruenbergerbeek Welpelweg, Overdinkel, Twente (co-ordinates 267.76-474.2), 22.x.2001; 1 adult, Mosbeek near crossing Doevenweg and Iemscheweg, Manderveen, Twente (co-ordinates 249.3-494.65), 15.x.2002. Province of Gelderland: 3 adults, Berkel near Oldenkott/Rekken (co-ordinates 248.7-457.1), 17.v.2001; 2 adults, same location, 22.v.2002. Province of Limburg: 1 ♀, Roer, Vlodrop (co-ordinates 203.75-348.96), 1.vi.2002.

Smit & Van der Hammen (2000) reported only three localities in the Netherlands, i.e. Gasteren-

sche Diep (province of Drenthe), Rosep (province of Noord-Brabant) and Grensmaas (province of Limburg). A population of the species was found in the Rosep, at the other two localities only a single specimen was found. Recently, populations were found at more localities. In Twente the species has a preference for streams with moss-covered stones. Many of the sites have been investigated for years, and this species was never found. A likely explanation for the recent expansion of this species could be an improved water quality.

#### *Hygrobatas calliger* Piersig, 1896

Province of Limburg: 1 ♂, 2 ♀, Geul, Epen (co-ordinates 192.70-310.29), 8.xi.2002.

The most recently collected material of *Hygrobatas calliger* was collected in 1946 (Smit & Van der Hammen 2000) and the species was considered extinct in the Netherlands (Van der Hammen & Smit 1996). The rediscovery in the





Figure 5

Distribution of *Atractides gibberipalpis*.

Figuur 5

Verspreiding van *Atractides gibberipalpis*.

river Geul, where it also was present in the past (Van der Hammen & Smit 1996), possibly reflects a slightly improving water quality over the last few years.

### *Hygrobatas longiporus* Thor, 1898

Province of Drenthe: 1 ♀, Gasterense Diep, Gasteren (co-ordinates 239.70- 561.70), 5.XI.2000.

A very rare species in the Netherlands, previously known from only two records in the provinces of Limburg and Noord-Brabant.

### *Atractides distans* (Viets, 1914)

Province of Limburg: 1 ♂, Vlootbeek (co-ordinates 193.60-352.50), 8.VI.1999. Province of Overijssel: 1 ♂, Rammelbeek, Twente (co-ordinates 268.65-491.13), 20.XI.2001; 2 adults, same locality, 20.XI.2001.

These are the first collected specimens of this species from the Netherlands since 1950 (Smit &

Van der Hammen 2000). The four previous records originate from the provinces of Noord-Brabant and Limburg (Davids 1979). The new records are from streams that are rich in vegetation, which is in accordance with the habitat preference given by Lundblad (1968). In the Vlootbeek the vegetation is dominated by *Callitriche*.

### *Atractides gibberipalpis* Piersig, 1898 (fig. 5)

Province of Limburg: 1 ♀, Belletterbeek near Cottessen (co-ordinates 193.53-308.27), 26.XI.2000 (ZMAN).

The species is new for the Dutch fauna.

The record is from an undegradated, calcareous spring brook in the hills of southern Limburg (EC: 480 µS/cm, calcium content: 2.59 mmol/l). *Atractides gibberipalpis* has a Palaearctic distribution, and is widespread in Europe, but is absent in Scandinavia.

### *Atractides tener tener* (Thor, 1899) (fig. 6)

Province of Limburg: 2 ♂, 3 ♀, spring Maalbeek/Aalsbeek, Maalbekerhöhe, Belfeld (co-ordinates 208.01-368.59), 16.XI.2002 (ZL, ZMAN); 1 ♀, Nartheciumbeekje, Vlodrop-Station, Meinweg (co-ordinates 207.85-351.28), 15.VI.2001 (BM).

The species is new for the Dutch fauna. The localities where the species was found are a spring and a spring brook with *Sphagnum*. Both sites have cold, acidic water (Maalbeek and Nartheciumbeek respectively: pH: 5.8, 6.4; EC: 340, 171 µS/cm). This strictly rheophilous species is mostly confined to streams and is not a spring species (Lundblad 1968). *Atractides tener tener* has a western Palaearctic distribution and is widespread in Europe.

### *Unionicola parvipora* Lundblad, 1920 (fig. 7)

Province of Noord-Holland: 3 ♂, Brouwersvaart; Haarlem (co-ordinates 101.750-488.970), 23.VII.2001; 1 ♂, ditch along Vrijheidsweg, Zuiderpolder, Haarlem (co-ordinates 105.930-487.685), 9.VII.2001; 1 ♀, canal Amsterdam Forest, Amsterdam (co-ordinates 116.640-478.650), 11.VI.2001. Province of Zuid-Holland: 1 adult, Ringvaart



Figure 6  
Distribution of *Atractides tener*.  
Figuur 6  
Verspreiding van *Atractides tener*.

north-west of Stolwijk, Krimpenerwaard (co-ordinates 111.818-443.700), 18.VII.2002; 9 adults, Ringvaart Polder Berkenwoude south of Berkenwoude, Krimpenerwaard (co-ordinates 111.818-443.700), 10.VII.2002; 7 adults, Alblas at Alblasserdam, Alblasserwaard (co-ordinates 104.694-430.474), 10.IX.2002; 28 adults, Graafstroom at Bleskensgraaf, Alblasserwaard (co-ordinates 112.421-431.394), 20.VIII.2002; 1 adult, Graafstroom at Molenaarsgraaf, Alblasserwaard (co-ordinates 117.340-432.690), 20.VIII.2002; 6 adults, Nieuwe Waterschap at Kinderdijk, Alblasserwaard (co-ordinates 103.350-433.550), 10.XI.2002; 13 adults, Nederwaard at Kinderdijk, Alblasserwaard (co-ordinates 102.970-432.460), 24.X.2002; 2 adults, De Giessen at Hardinxveld-Giessendam, Alblasserwaard (co-ordinates 117.187-427.057), 4.XI.2002; 9 adults, De Giessen at Giessenburg, Alblasserwaard (co-ordinates 120.555-429.468), 22.VIII.2002; 2 adults, De Giessen at Pinkeveer, Alblasserwaard (co-ordinates 121.600-431.170), 30.VII.2002; 1 adult, Groote or Achterwaterschap



Figure 7  
Distribution of *Unionicola parvipora*.  
Figuur 7  
Verspreiding van *Unionicola parvipora*.

at pumping-station Elshout, Kinderdijk, Alblasserwaard (co-ordinates 103.444-433.583), 10.XI.2002; 1 adult, Groote or Achterwaterschap at Zijdebrug, Alblasserwaard (co-ordinates 110.520-432.680), 10.XI.2002; 4 adults, Smoutjesvliet at Goudriaan, Alblasserwaard (co-ordinates 120.530-434.800), 19.VIII.2002; 1 adult, Kromme Giessen east of Pinkeveer, Alblasserwaard (co-ordinates 122.740-431.410), 7.VIII.2002; 2 adults, Pijpwetering, Polder Grootewaard, Alblasserwaard (co-ordinates 123.780-433.550), 7.VIII.2002; 7 adults, ditch along Tiendweg west of Groot-Ammers, Alblasserwaard (co-ordinates 123.780-433.550), 6.VIII.2002.

This was considered to be a very rare species in the Netherlands since it was only found in the Holland-Utrecht lake and fen meadow area with a few records from the Alblasserwaard (the eastern part of the province of Zuid-Holland). The number of records is increasing, especially from the province of Zuid-Holland. All localities are canals.



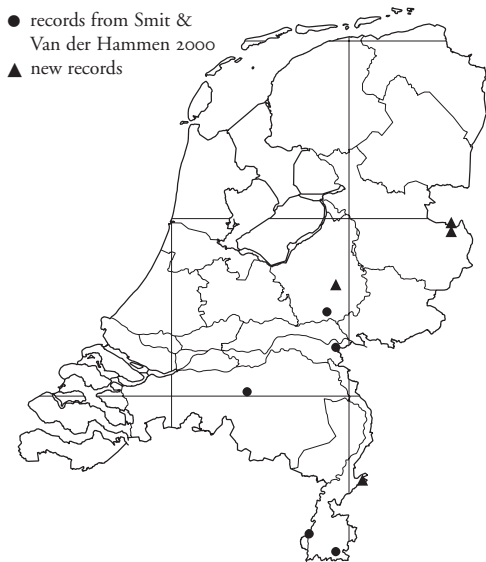


Figure 8  
Distribution of *Ljanía bipapíllata*.  
Figuur 8  
Verspreiding van *Ljanía bipapíllata*.

### *Feltria brevipes* Walter, 1907

Province of Limburg: 2 ♀, Klitserbeek, Bommerig, Epe (co-ordinates 193.15-310.42), 17.1.2003.

Recently, the species was only collected in the Molenbeek near Geulle, in the province of Limburg. In the past it was reported from three other streams in the same province.

### *Ljanía bipapíllata* Thor, 1898 (fig. 8)

Province of Overijssel: 1 adult, Springendalse Beek (southern branch), Ootmarsum, Twente (co-ordinates 256.60-494.70), 28.v.1994; 5 adults, same location, 8.iv.1997; 1 adult, same location, 10.xi.1997; 1 ♂, same location, 17.1.2000; 1 ♀, Springendal, Nutterveldbeek, southern spring stream, Twente (co-ordinates 256.61-494.81), 24.x.2001; 1 ♂, Springendalse beek (spring area southern branch), Ootmarsum, Twente (co-ordinates 256.20-494.87), 23.x.2002; 1 adult, Mosbeek, Maatmansweg, Twente (co-ordinates 255.3-496.3), 23.x.2002; 1 ♀, Poelbeek, upper course, Witte-

bergweg, Nutter, Twente (co-ordinates 257.85-493.65), 16.vi.1998. Province of Gelderland: 1 ♂, Oude beek, Beekbergen (co-ordinates 194.08-464.06), 6.iv.1998; 1 adult, same location, 13.1.2003. Province of Limburg: 1 ♀, Narthecium-beekje, Vlodrop-Station, Meinweg (co-ordinates 207.85-351.28), 15.vi.2001.

Recently, the species was collected in a stream near Nijmegen (Smit & Van der Hammen 2000). Davids (1979) reported the species from four localities in the provinces of Gelderland, Limburg and Noord-Brabant. All recent records were from upper courses of streams with a constant temperature and coarse or very coarse detritus.

### *Aturus fontinalis* Lundblad, 1920

Province of Overijssel: 2 ♀, Mosbeek, Bergweg, Mander, Twente (co-ordinates 253.3-496.13), 15.v.2002; 2 ♀, Hazelbeek, Twente (co-ordinates 253.65-493.92), 22.v.2002.

This is a very rare species in the Netherlands and was only known from the Geul in the province of Limburg, where Besseling collected it in 1949 (Smit & Van der Hammen 2000).

### *Aturus scaber rotundus* Romijn, 1921

Province of Limburg: 1 ♀, Hemelbeek/Poortlossing, Broekhoven (co-ordinates 180.73-327.32), 2.x.2000; 1 ♀, Mechelderbeek, Mechelen (co-ordinates 192.71-311.80), 17.1.2003.

Previously, this was a common and abundant species of streams in the province of Limburg, but it was not collected since the 1950s. The new records originate from little-polluted, small streams.

### *Mideopsis willmanni* (Viets, 1920)

Province of Overijssel: 2 adults, spring Kersberg, Nutter, Twente (co-ordinates 256.73-493.35), 29.xi.1997.

Previously, the species was only known from two helocrenes near Oldenzaal, province of Overijssel (Smit & Van der Hammen 2000).



Figure 9  
Distribution of *Arrenurus tetracyphus*.  
Figuur 9  
Verspreiding van *Arrenurus tetracyphus*.

***Arrenurus biscissus* Lebert, 1879**

Province of Overijssel: 1 adult, Benedendinkel, Ottershagenweg, Lattrop, Twente (co-ordinates 261.98-494.00), 10.X.2000.

This species was previously known only from two lowlands streams in the province of Overijssel and from Lake Maarsseveen. The new record is also from a lowland stream.

***Arrenurus fontinalis* Viets, 1920**

Province of Limburg: 1 ♀, spring Honsbeek, Born (co-ordinates 185.55-336.82), 15.VI.1998.

Remarks: This species was previously reported from two locations in the Netherlands (Smit & Van der Hammen 2000). These old records were not from its typical spring habitat. This new material, the first since 1937, was collected in the typical habitat. The Honsbeek spring has an electrolyte rich water quality (mean chemical values: EC: 973 µS/cm; sulphate: 129 mg/l; calcium: 3.66

mmol/l). The spring is cold and shaded and has a well developed substrate variety with sand, gravel, fine and coarse organic materials. A part of the spring and adjacent spring brook is abundantly vegetated by *Berula erecta*.

***Arrenurus tetracyphus* Piersig, 1894 (fig. 9)**

Province of Friesland: 1 ♂, turbary De Deelen, Heerenveen (co-ordinates 190.84-560.63), 7.V.1998 (ZMAN).

Remarks: The species is new for the Dutch fauna. The species has a western Palaearctic distribution, with most records from eastern Europe, but it was also reported from Germany and France. *Arrenurus tetracyphus* occurs in stagnant waters, especially in lakes. In Poland it is characteristic for eutrophic-dystrophic lakes (Biesiadka & Kowalik 1991).

***Arrenurus nielsenii* Münchberg, 1935 (fig. 10-15)**

Material examined: 1 ♂, 1 ♀, syntypes, Ricciene (Forli) at Adria, Italy, leg. Münchberg (slide 5105, SMF). Province of Limburg, the Netherlands: 1 ♂, moorland pool, Zandbergleslenk Oost, Meinweg, Herkenbosch (co-ordinates 207.34-354.67), 26.VI.2000 (ZMAN).

The species is new for the Dutch fauna. Münchberg (1935) described *A. nielsenii* on the basis of material reared from larvae found on the damselfly *Ischnura elegans* (Vander Linden, 1820), collected in Italy on June, 26, 1934. His description and illustrations are inadequate and therefore a redescription is given of the species (measurements of the Dutch specimen in brackets). Since this new record represents the first record since the description of the species, it is thus also new for the Dutch fauna.

The location where the species was found in the Netherlands is a recently restored moorland pool, from which the bottom has been excavated. The acidity of the water is circumneutral but with little electrolytes, as it receives superficial seepage water (mean pH: 7.1, EC: 114 µS/cm). Other

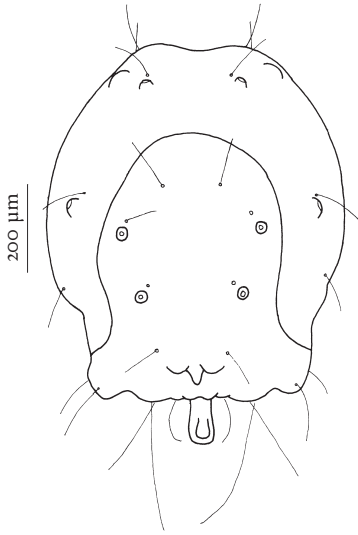


Figure 10  
*Arrenurus nielseni*, ♂, Ven Zandbergsloot Oost, dorsal view.  
 Figuur 10  
*Arrenurus nielseni*, ♂, Ven Zandbergsloot Oost, dorsaal.

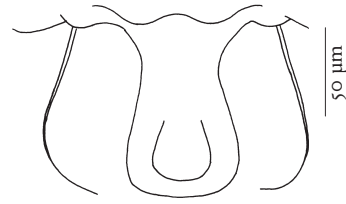
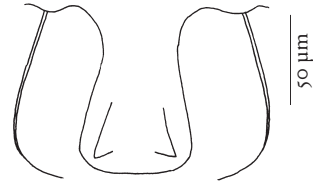


Figure 11  
*Arrenurus nielseni*, ♂, Ven Zandbergsloot Oost, detail of petiole, dorsal view.



Figuur 11  
*Arrenurus nielseni*, ♂, Ven Zandbergsloot Oost, detail van petiolus, dorsaal.

Figure 12  
*Arrenurus nielseni*, ♂, Ven Zandbergsloot Oost, detail of petiole, ventral view.

Figuur 12  
*Arrenurus nielseni*, ♂, Ven Zandbergsloot Oost, detail van petiolus, ventraal.

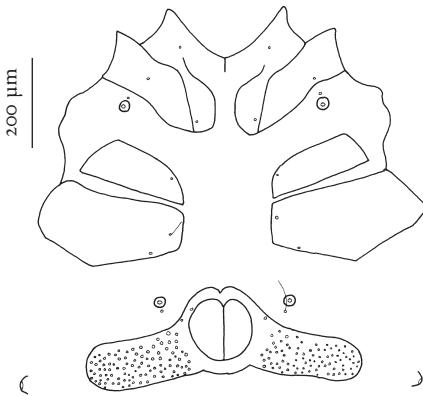


Figure 14  
*Arrenurus nielseni*, ♀, ventral view, syntype, Ricciene, Italy (slide 5105, SMF).  
 Figuur 14  
*Arrenurus nielseni*, ♀, ventraal, syntype, palp, Ricciene, Italy (preparaat 5105, SMF).

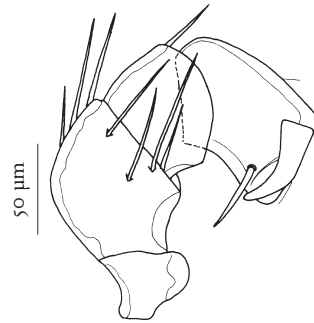


Figure 13  
*Arrenurus nielseni*, ♂, syntype, palp, Ricciene, Italy (slide 5105, SMF).  
 Figuur 13  
*Arrenurus nielseni*, ♂, syntype, palp, Ricciene, Italy (preparaat 5105, SMF).

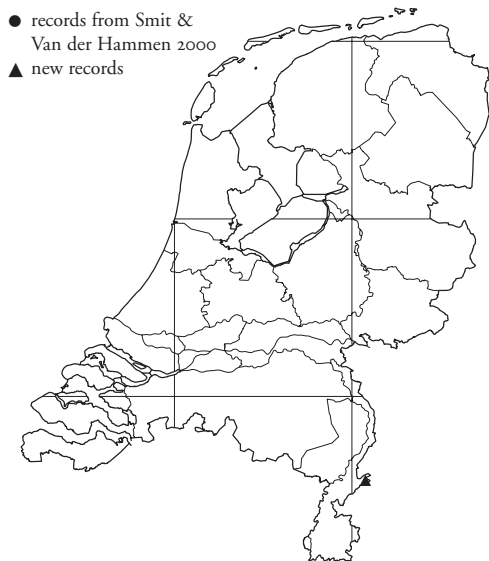


Figure 15  
Distribution of *Arrenurus nielseni*.  
Figuur 15  
Verspreiding van *Arrenurus nielseni*.

samples yielded no more specimens.

### Redescription

*Diagnosis*: The male of *A. nielseni* resembles *A. robustus*, but petiole ventrally with two triangular projections. In *A. robustus* the petiole only has two slender ligulate ridges, which are highest in the middle and are gradually tapering caudally. The small group of setae on the medioventral side of PIV in *A. robustus* is lacking in *A. nielseni*.

*Male*: Body colour brownish green, body 875 (899) long (including petiole) and 770 (680) wide; body width of syntype male probably deformed as a result of mounting. Anterior body margin straight, but convex in the Dutch specimen. Width of dorsal shield 454 (413), dorsal furrow passing onto lateral body sides (fig. 10). Medial distance of third and fourth coxal plates large, measuring 89 (81) and 162 (130) respectively. Genital plates almost extending to lateral body margin. V2 on small humps. Cauda short, pygal

lobes small. Hyaline membrane small, with a concave posterior margin. Petiole slightly widened posteriorly, ligulate process rounded posteriorly, not extending to posterior margin of petiole (fig. 11). Petiole ventrally with two triangular projections (fig. 12). iv-leg-4 with a short spur. Lengths of PI-PV: 40, 82, 64, 89, 56; PII with four setae on medial side (fig. 13).

*Female*: The syntype female is deformed as a result of mounting, and its exact shape cannot be established anymore. According to Münchberg (1935), the shape of the female is circular to egg-shaped, without posterolateral corners. The body length of the female is 1180-1290. The capitular bay is wide V-shaped, first coxal plates extending beyond the anterior body margin. Medial margin of third coxal plates shorter than medial margin of fourth coxal plates. Medial distance of the fourth coxal plates large, much larger than width of two genital valves. Genital valve without sclerotized patches. Genital plates relatively short, part with acetabula 2.5 times as long as wide (fig. 14). Length of PI-PV: 40, 84, 68, 104, 58; PII with three setae on medial side.

### *Arrenurus geminus* George, 1901

Province of Drenthe: Deurzerdiep, southeast of Assen (co-ordinates 236.40-554.00), 27.IV.1999.

This species was found at a small number of locations throughout the Netherlands. Smit & Van der Hammen (2000) stated that the species occurs only in spring. However, a number of the older records were from summer.

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## REFERENCES

- Biesiadka, E. & W. Kowalik 1991. Water mites (Hydracarina) as indicators of trophy and pollution in lakes. – In: F. Dusbábek & V. Bukva (Eds.), *Modern Acarology 1*. SPB Academic Publishers, The Hague: 475-481.
- Davids, C. 1979. De watermijten (Hydrachnellae) van Nederland. Levenswijze en voorkomen. – *Wetenschappelijke Mededelingen Koninklijke Nederlandse Natuurhistorische Vereniging* 132: 1-78.
- Hammen, H. van der & H. Smit 1996. The water mites (Acari: Hydrachnidia) of streams in the Netherlands: distribution and ecological aspects on a regional scale. – *Netherlands Journal of Aquatic Ecology* 30: 175-185.
- Imamura, T. & R. Mitchell 1967. The ecology and life cycle of the water mite, *Piersigia limophila* Protz. – *Annotationes Zoologicae Japonenses* 40: 37-44.
- Jin D.-C. & R. Wiles 1996. New species of *Arrenurus* Dugès (Acari: Hydrachnidia: Arrenuridae) from China and first records of watermites from Laos. – *Acarologia* 37: 317-344.
- Lundblad, O. 1962. Die Hydracarinen Schwedens. II. – *Arkiv för Zoologi* (2) 14: 1-635.
- Lundblad, O. 1968. Die Hydracarinen Schwedens. III. – *Arkiv för Zoologi* (2) 21(1): 1-633.
- 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: Hydrachnellae). – *Entomologische Berichten, Amsterdam* 57: 113-118.
- Münchberg, P. 1935. Eine *Arrenurus robustus* Koenike nahestehende neue Milbenart aus Norditalien. – *Zoologischer Anzeiger* 110: 66-71.
- Smit, H. & H. van der Hammen 2000. Atlas van de Nederlandse watermijten (Acari: Hydrachnidia). – *Nederlandse Faunistische Mededelingen* 13: 1-272.
- Viets, K. 1936. Spinnentiere oder Arachnoidea. VII: Wassermilben oder Hydracarina (Hydrachnellae und Halacaridae). – *Die Tierwelt Deutschlands* 31-32: 1-574.
- Wiles, P.R. 1997. The homology of glands and glandularia in the water mites (Acari: Hydrachnidia). – *Journal of Natural History* 31: 1237-1251.

## SAMENVATTING

### Nieuwe waarnemingen van zeldzame watermijten in Nederland (Acari: Hydrachnidia)

De recent gepubliceerde atlas van de Nederlandse watermijten heeft een aantal mensen gestimuleerd meer aandacht aan deze groep van aquatische macrofauna te besteden. In de korte periode sinds deze publicatie zijn vijf nieuwe soorten voor de Nederlandse fauna gevonden: *Lebertia sefvei*, *Atractides gibberipalpis*, *Atractides tener*, *Arrenurus tetracyphus* en *Arrenurus nielseni*.

Verder zijn er vijf soorten gevonden die al enkele decennia niet meer waren waargenomen.

Deze nieuwe waarnemingen zijn slechts voor een deel toe te schrijven aan de vergrote interesse in deze groep. Verscheidene waarnemingen zijn namelijk gedaan in beken die al intensief in de periode 1990-2000, of zelfs nog langer, gemonitord werden. Aangezien de meest interessante waarnemingen afkomstig zijn uit beken, is de voorzichtige conclusie getrokken dat de kwaliteit van beken, in de breedste zin, verbeterd is. De kwaliteit is echter nog lang niet op het oude niveau. Een aantal genera, zoals *Aturus*, was vroeger zeer talrijk, maar is tegenwoordig nog steeds zeldzaam.

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