

Taxonomic notes on some *Arrenurus* species (Acari: Hydrachnellae)

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Abstract: Examination of several thousands of samples of water mites from The Netherlands led to the conclusion that *Arrenurus curvisetus*, described from a female, is a junior synonym of *A. mediorotundatus*, described originally after a male. Similarly *A. schreuderi* is considered a junior synonym of *A. knauthei*. In addition, the identity of several other *Arrenurus* species is discussed.

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Introduction

The genus *Arrenurus* Dugès, 1833, is characterized by a strongly developed sexual dimorphism. Males and females of many *Arrenurus* species have not been described simultaneously and not always by the same author. Therefore, it is not surprising that males and females were described as different species, though they are conspecific. For rare species it can be especially difficult to find a matching female for a previously described male.

The identity of *Arrenurus latus* and *A. mediorotundatus*

Arrenurus latus, Barrois & Moniez, 1887

- A. latus* Barrois & Moniez, 1887: 30 (male)
A. mediorotundatus; Koenike, 1908: 225, fig. 10 (female)
A. latus; Koenike, 1909: 183 (female)
A. mediorotundatus; Viets, 1936: 463, fig. 546 (female)
A. latus; Viets, 1936: 463, fig. 547 (female)
A. mediorotundatus; Besseling, 1964: 176, fig. 293 (female)

Arrenurus mediorotundatus Thor, 1898

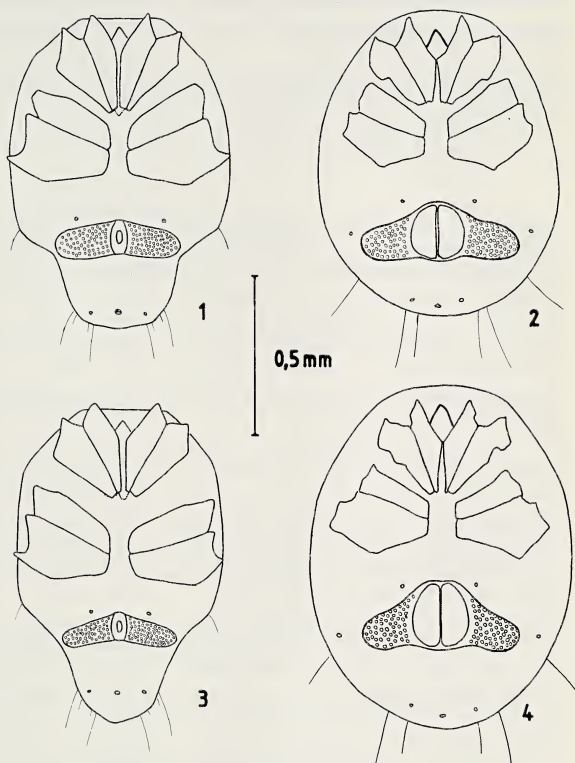
- A. mediorotundatus* Thor, 1898: 10 (male)
A. curvisetus; Viets, 1936: 461, fig. 541 (female) **new syn.**

The first to describe *A. latus* were Barrois & Moniez (1887); they described only the male, but provided no illustration. Later, the female was depicted by Koenike (1909), without a description.

The first description of a male *A. medioro-*

tundatus was provided by Thor (1898). The first female was described by Koenike (1908), but this author did not provide a species differentiation. Females of *A. latus* and *A. mediorotundatus* are, according to the original descriptions, very similar to each other. Viets (1936) suggested that the difference between the females lies in the genital lips: round in *A. latus*, elliptical in *A. mediorotundatus*. Further, the lower border of the acetabular plate is curved in *A. mediorotundatus*, and straight in *A. latus*. Because the form of the acetabular plates and the genital lips of the females is rather variable, we regard the differences given by Viets of little value.

On account of these distinguishing characters, most, if not all, of the reported females can be identified as *A. mediorotundatus*. However, males of *A. mediorotundatus* appear to be very rare. In the province of Noord-Holland approximately 1500 localities have been examined on water mites; females of *A. mediorotundatus* were found in 107 locations, but in only one location males of *A. mediorotundatus* were collected. In The Netherlands so far more than 4000 localities have been examined on water mites. On four localities males of *A. mediorotundatus* have been found. However, males of *A. latus* are quite common in The Netherlands, while males of *A. latus* and fe-



Figs. 1-4. *Arrenurus* species, ventral sides. 1, *A. pugionifer*, male; 2, *A. pugionifer*, females; 3, *A. inexploratus*, male; 4, *A. inexploratus*, female.

males identified as *A. mediorotundatus* are often found together. Therefore, it may be concluded that females which were up to now identified as *A. mediorotundatus* in fact belong to *A. latus*.

It is not easy to determine which female is conspecific with the male *A. mediorotundatus*, because of the rarity of the species. Some evidence exists that *Arrenurus curvisetus* Viets, 1936, which is known in the female sex only, is conspecific to *A. mediorotundatus*. Females of *A. curvisetus* have a hairbrush on the second palpal segment, similar to the males of *A. me-*

diorotundatus. *A. curvisetus* is very rare in The Netherlands, females have been reported from only 9 locations (of 4000 localities). Very recently, in 1989, we collected males of *A. mediorotundatus* and females of *A. curvisetus* together in the dunes near Den Haag. In seven of the 15 sites sampled in this area females of *A. curvisetus* and/or males of *A. mediorotundatus* were found; on two locations we found both males and females. We therefore consider *A. curvisetus* a junior synonym of *A. mediorotundatus*.

The synonymy of *Arrenurus knauthei* and *A. schreuderi* and the identity of *A. sinuator*

Arrenurus knauthei Koenike, 1895

A. knauthei Koenike, 1895: 379, fig. 3 (male)

A. knauthei; Viets, 1936: 446, fig. 509 (male)

A. knauthei; Besseling, 1964: 172, fig. 276 (male)

A. schreuderi Besseling, 1953: 289 (female)

A. schreuderi; Besseling, 1964: 191, fig. 333 (female) **new syn.**

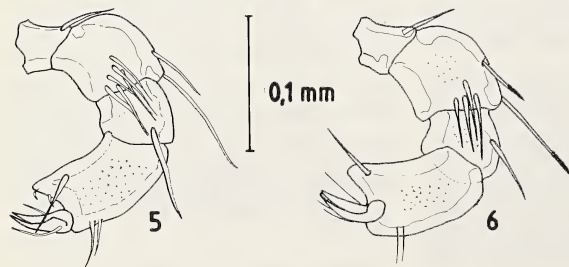
The male of *A. knauthei* was first described by Koenike (1895). The female of *A. knauthei* was described by the same author in 1908. Again, no rationale was provided why the female was conspecific with *A. knauthei*. *Arrenurus schreuderi* was described by Besseling (1953) in the female sex only; the male is unknown. According to Viets (1936), the female of *A. knauthei* differs from closely related species in the distance between the fourth coxae, which is larger than the width of one genital lip. However, we found this also true for other species, e.g. *A. sinuator* (Müller, 1776). The illustration of the *A. knauthei* female by Koenike (1908) shows that the medial length of the fourth coxa is larger than the medial length of the third coxa. This is also a distinctive character of the female *A. sinuator*. Both females have a large hairbrush on the second palpal segment. Further, males of *A. knauthei* and females of *A. schreuderi* are regularly found together, and females of *A. knauthei* were never reported from The Netherlands. In the province of Zuid-Holland for example male *A. knauthei* were collected in 15 of 200 locations studied and female *A. schreuderi* were found in 16 locations. Seven locations contained both male and female. Females of *A. knauthei*

were not reported. From these data it may be concluded that males of *A. knauthei* and females of *A. schreuderi* are conspecific. *Arrenurus schreuderi* is a junior synonym of *Arrenurus knauthei*. The female of *A. knauthei* described by Koenike (1908) is tentatively considered to be the female of *A. sinuator*, as we have not been able to study the holotype.

The distinction of *Arrenurus bifidicodulus*, *A. inexploratus* and *A. pugionifer*

Males of these three species are rather easy to identify. Males of *A. pugionifer* Koenike, 1908, have two small spines on the cauda ("Dolchborste"). Males of *A. inexploratus* Viets, 1936, have a rudimentary petiole in the form of a teardrop. The cauda of *A. pugionifer* (fig. 1) is more angular than the cauda of *A. inexploratus* (fig. 3) and the acetabular plates of *A. pugionifer* are 1.5 times as broad as the acetabular plates of *A. inexploratus*.

Females of *A. bifidicodulus* Piersig, 1897, are easily distinguished from *A. pugionifer* and *A. inexploratus* in having a fourth palpal segment with a straight or convex distal margin. The distal margin is concave in the other two species. A distinction between females of *A. pugionifer* and *A. inexploratus* is more difficult. Like the males, the acetabular plates of *A. pugionifer* (fig. 2) are more robust and slightly broader than in *A. inexploratus* (fig. 4). Further *A. pugionifer* has 5-6 setae on the second palpal segment (fig. 5) and *A. inexploratus* 3-5 (fig. 6). With some experience, it is possible to separate females with pronounced characteristics. However, intermediate females are not always separable.



Figs. 5-6. *Arrenurus* species, female left palp. 5, *A. pugionifer*; 6, *A. inexploratus*.

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