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THE HYDRACHNELLAE OF THE OUDEMANS COLLECTION

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On several occasions the Hydrachnellae of the Oudemans Collection have been the subject of a publication. In 1898 Oudemans himself published a "List of Dutch Acari, 6th part, Hydrachnellae Latr., 1802" in which nineteen indigenous species were enumerated. Afterwards Romijn (1916) dealt with "Oudemans' Hydracarina", thereby increasing the number of Dutch species to 26, although he paid attention to the adult mites only. Finally there appeared a catalogue of the Oudemans Collection, prepared by Buitendijk (1945), in which the Hydrachnellae are listed on pp. 343-347.

Because Buitendijk (1945) considered her catalogue a preliminary one, it is evident that reliable conclusions on the material were still to be awaited. This justifies the appearance of the present paper which contains a more definite report on the Hydrachnellae of the collection.

It has been impossible to prepare a complete and satisfactory comparison of the above-mentioned lists. Several slides referred to in the cited papers are no more in existence, whilst Oudemans provided some of the remaining slides with new labels (it is unknown whether this happened before Romijn published his list, or afterwards). A number of Romijn's corrections are, however, still present on the labels, as mentioned below. With the exception of some striking and altogether certain facts, I shall generally refer only to the preliminary catalogue (Buitendijk, 1945).

The present paper is to be regarded as a supplement to Buitendijk's Catalogue. The number of species proved to be much larger than was originally expected. A great number of slides of larvae is still present. The original drawings, mentioned below up till now all have remained unpublished. When studying the collection it became evident that after 1900 Oudemans practically did not pursue any research on Hydrachnellae.

Hydrovolziidae

Hydrovolzia placophora (Monti, 1905)

Three original drawings are present (nos. 1154-1156), prepared after slide no. 2956 from Dr. K. Viets.

Hydrachnidae

Hydrachna geographica O.F.M., 1776

Arnhem (*H. geographica*, Buitendijk, 1945).

Hydrachna globosa (De Geer, 1778) s.l. (nympha)

Sneek (*H. globosa*, Buitendijk, 1945).

Hydrachna globosa uniscutata Thor, 1897

Elden (*Hydrarachna uniscutata*, Romijn, 1916; *H. paludosa*, and *uniscutata*, Buitendijk, 1945).

The material of this species consists of 4 slides which were identified by Oudemans as *paludosa*. One of the slides (which contains the dorsal shield) is provided with the correction "*uniscutata* S. Thor", written in pencil by



Fig. 1. *Hydrachna globosa uniscutata* ♂. Dorsal shield. From Oudemans's unpublished Plate 1147.

Romijn. In fig. 1 I represent this shield after a part of one of Oudemans's original drawings (no. 1147); it is slightly different from the shape that is typical of the species.

Borkum (*H. regulifera*, Buitendijk, 1945).

Hydrachna spec.

Sneek (*Hydrarachna levigata*, Romijn, 1916; *H. laevigata*, Buitendijk, 1945).

One slide containing 9 adults and nymphs was identified by Oudemans as "*globosa*", which Romijn corrected in pencil into "*levigata* Koen." Only one specimen still shows the papillae of the skin; the remaining mites have a skin which is irregularly wrinkled or smooth, while it is often damaged. Probably this is a result of the method of mounting of the slide. It is impossible to recognize the complete shape of the dorsal shield of any of the specimens. The smooth state of the skin of many specimens may have induced Romijn to arrive at a different identification; I am, however, unable

to recognize *levigata* in this slide. Judging by the shape of the medial ends of the fourth epimeres, 2 or 3 different species of *Hydrachna* are present.

Hydrachna spec. (larva)

Sneek, Buré (*H. globosa*, Buitendijk, 1945).

In my opinion it is impossible to arrive at a specific identification of larvae belonging to the genus *Hydrachna*. Therefore, the two larvae, mentioned by Buitendijk as *globosa*, are placed here.

Arnhem, Nijkerk (*H. spec.*, Buitendijk, 1945).

Limnocharidae

Limnochares aquatica (L., 1758)

Arnhem (*L. aquatica*, Buitendijk, 1945).

Eylaidae

Eylais extendens (O.F.M., 1776)

Arnhem (*E. Soari*, Romijn, 1916; *E. soari*, Buitendijk, 1945).

The material consists of 4 slides and drawing no. 1146. The slide marked M L 3 contains the maxillary organ; this led to the identification.

Haven 's-Gravenmoer 3.7.16 (nympha) (*E. spec.*, Buitendijk, 1945).

For the material from Sneek I refer to the following species.

Eylais hamata Koen., 1897

Nijmegen, Sneek, Borkum (*E. hamata*, Buitendijk, 1945).

On slide M L 4 containing specimens from Sneek Romijn altered the name "*extendens*" to "*hamata*". The same correction occurs on slide M L 2 which contains 7 mites (two small nymphs and five large adults); the adults indeed represent *hamata* but the nymphs on the contrary belong to *extendens*.

Eylais spec.

Rosmalen (*E. rimosa*, Buitendijk, 1945).

This slide contains only an eye-plate and palpi, which do not permit a specific identification.

's-Hertogenbosch (*E. spec.*, Buitendijk, 1945).

Piersigia intermedia Will., 1914

Three original drawings (nos. 1151-1153) are present, prepared after slide 3133 from Dr. K. Viets.

Thyasidae

Euthyas truncata (Neum., 1874) (larva)

Sierakowitz (*Hydryphantes gymnopterorum*, Buitendijk, 1945 ?).

On the label the identification "*Hydrodroma rubra*" is deleted by pencil.

Thyas spec. (larva)

Buré (*Thyas venusta*, Buitendijk, 1945).

Hydryphantidae

Hydryphantes ruber ruber (De Geer, 1778).

For unknown reasons Oudemans has added two names (*gymnopterorum* and *ruber*) to some of the slides of this species. The first name is, however, a synonym of the second.

Arnhem. This is one of the four unidentified slides with larvae which are mentioned on p. 343 of Buitendijk's catalogue.

Terschelling (*H. Bayeri*, Romijn, 1916; *H. bayeri*, Buitendijk, 1945).

Oudemans's original plate no. 1150 was certainly drawn after this slide; the figure as well as the slide show the same deformation of the right genital plate which has only one acetabulum. The specimen has been mounted without previous dissection and the mite is slightly wrinkled; in the slide as well as in the drawing it appears to be round instead of oval. The dorsal shield has not a horizontal position in the slide, but is sloping backward so that one might erroneously conclude it to be much broader than long. This certainly induced Romijn to identify the specimen with *H. bayeri* Oudemans, afterwards, cancelled this identification on drawing no. 1150. It is quite certain that the mounted specimen belongs to *H. ruber*; its locality is not Buré as was noted in the preliminary catalogue.

Sneek (*H. gymnopterorum*, Buitendijk, 1945).

This slide contains four specimens of *H. ruber* and two of *H. dispar*.

Utrecht (*H. gymnopterorum*, and *H. tenuipalpis*, Buitendijk, 1945 2 ×).

Hydryphantes dispar (Von Schaub, 1888)

Sneek (*H. gymnopterorum*, Buitendijk, 1945, ad partem, cf. *H. ruber*).

Utrecht and Doorwerth (*H. dispar* Buitendijk, 1945).

Hydryphantes placationis Thon, 1899

Sneek (*H. placationis*, Romijn, 1916; Buitendijk, 1945).

The determination in pencil on the label is in Romijn's handwriting.

Hydryphantes novum (Oudemans, 1903)

Zeist (*H. gymnopterorum*, Buitendijk, 1945). Drawing no. 1149.

Vitzthum (1941) while dealing with the known larvae of *Hydryphantes* also mentioned *Thrombidium novum* Oudemans (1902, p. 22; 1902a, p. 37; 1903, p. 3, pl. 1 figs. 9-19). He concluded that Oudemans did not recognize the species as belonging to the genus *Hydryphantes*, but he appeared to be unaware of the fact that Oudemans (1909, p. 57 in a note; 1910, explanation of fig. 16) already placed the name in the synonymy of *Hydryphantes ruber*.

In my opinion it is not certain that *Thrombidium novum* is the larva of *H. ruber*, although it certainly belongs to the genus *Hydryphantes*. Several species of *Hydryphantes* occur in our country and the relation of *H. novum* to one of these is still to be shown. Consequently the larva dealt with here provisionally has to keep its present name.

Oudemans (1902) recorded *Scatophaga merdaria* L. as the host of the

larvae; this is a dipterous species now called *Scopeuma stercorarium* var. *merdaria* (L.). Oudemans (1903) wrote that the species was collected "on various kinds of Diptera, swarming over *Urtica dioica*". On the label of the slide the only host record is "Diptera".

Hydryphantes spec.

Warnsveld (*H. spec.*, Buitendijk, 1945).

Hydryphantes spec. (larva)

Brussels (*H. gymnopterorum* Buitendijk, 1945).

Hydrodromidae

Hydrodroma despiciens pilosa Bess., 1940

Arnhem (*Diplodontus decipiens* Buitendijk, 1945).

Hydrodroma despiciens (O.F.M., 1776) var?

Arnhem (*Diplodontus decipiens*, and *D. spec.*, Buitendijk, 1945 2 ×).

Hydrodroma despiciens (O.F.M., 1776) (larva)

Bremen and Bergen (*Diplodontus decipiens*, Buitendijk, 1945).

Sperchonidae

Sperchon brevirostris Koen., 1895

Harzburg (*Sp. brevirostris* Buitendijk, 1945).

Sperchon spec. (larva)

Buré (*Hydryphantes ruber* Buitendijk, 1945).

Lebertiidae

Lebertia oudemansi Koen., 1897

Hammerfest (*L. oudemansi* Buitendijk, 1945).

I agree with Viets (1930, p. 9) that the remains of the type specimen of the species, present in one slide in the Collection, do no more lend themselves to an exact identification.

Frontipoda musculus (O.F.M., 1776). var?

Netherlands (*Fr. musculus* Buitendijk, 1945).

Limnesiidae

Limnesia undulata (O.F.M., 1776)

Vreeland (*L. undulata* Buitendijk, 1945).

Sneek (*L. fulgida* and *histrionica*, Buitendijk, 1945 2 ×).

Haarlem (*L. fulgida* and *undulata*, Buitendijk, 1945 2 ×).

Utrecht (*L. histrionica*, Buitendijk, 1945).

The last named slide contains 1 specimen of *undulata* and 2 of *fulgida*.

Limnesia maculata maculata (O.F.M., 1776)

Arnhem, Doorwerth, Sneek (*L. maculata* Buitendijk, 1945 3 ×).

Limnesia fulgida Koch, 1836

Utrecht (*L. histrionica*, Buitendijk, 1945).

As I stated above two specimens of the present species are contained in

a slide labelled as *L. histrionica*; the slide moreover contains one specimen of *L. undulata*.

Arnhem (*L. undulata*, Buitendijk, 1945).

Limnesia spec. (nympha)

Haarlem (*L. spec.* Buitendijk, 1945).

Hygrobatidae

Hygrobatodes longipalpis (Herm., 1804)

Oisterwijk (*H. longipalpis*, Buitendijk, 1945).

Atractodes nodipalpis nodipalpis (Thor, 1899)

Gulpen (*Megapus spinipes*, Buitendijk, 1945).

Unionicolidae

Unionicola crassipes crassipes (O.F.M., 1776)

Vreeland (*U. crassipes*, Buitendijk, 1945).

Unionicola ypsilophora (Bonz, 1783)

London (*U. ypsilophorus*, Buitendijk, 1945).

Unionicola spec. (nympha)

Arnhem (*U. crassipes*, Buitendijk, 1945).

Neumania vernalis (O.F.M., 1776)

Delden, ♀ (*Unionicola* spec. Buitendijk, 1945).

Pionidae

Hydrochoreutes krameri Piers., 1895

Bemmel, ♀ (*H. krameri* Buitendijk, 1945).

The locality of the specimen is not "Strang" as was erroneously given by Buitendijk, but Bemmel. The slide that originates from Romijn's collection bears a label with the data: "Strang-Bemmel". A "strang" is a dead branch of a river in the clay-district of our country.

Tiphys ornatus Koch, 1836

Sneek (*Acercus ornatus*, Buitendijk, 1945).

On the label the name is written in pencil in Romijn's handwriting.

Sneek (Probably *Acercus* spec., Buitendijk, 1945).

Romijn wrote in pencil on the label: *Acercus ensifer*.

Tiphys spec.

Scharsterbrug, Sneek (*Acercus* spec., Buitendijk, 1945).

Oudemans added in pencil the name *Acercus*, the specimen was previously identified as (*Nesaea*) *decorata* Neum., a name that belongs in the synonymy of *Piona variabilis*.

Utrecht (*Acercus ensifer*, Romijn, 1916, *Acercus* spec., Buitendijk, 1945).

On the label of the slide Romijn wrote in pencil: *Acercus ensifer*.

Pionopsis lutescens (Herm., 1804)

Sneek, ♂ (*Acercus* spec., Buitendijk, 1945).

The name *Acercus* in pencil on the slide originates from Romijn.

Pionacercus vatrax crassipes Bess., 1946

Utrecht (*Acercus* spec., Buitendijk, 1945).

Piona coccinea coccinea (Koch, 1836)

Arnhem and Sneek (*P. longicornis*, Buitendijk, 1945).

Piona coccinea stjördalensis (Thor, 1897)

Vreeland and Sneek (*P. longicornis*, Buitendijk, 1945).

Piona coccinea (Koch, 1836) var?

Haarlem (*P. longicornis*, Buitendijk, 1945).

Sneek (*P. longicornis*, *P. variabilis*, *Acercus roseus*, Buitendijk, 1945,

3 ×).

Piona rotunda rotundoïdes Thor, 1897

Haarlem (*P. conglobata*, Buitendijk, 1945).

Piona longipalpis (Krend., 1894)

Sneek, Bremen (*P. longipalpis*, Buitendijk, 1945 2 ×).

Piona uncata uncata (Koen., 1888)

Sneek (*P. conglobata*, Buitendijk, 1945).

Piona variabilis variabilis (Koch, 1836)

Sneek (*P. variabilis*, Buitendijk, 1945).

Piona conglobata punctata (Neum., 1875)

Doorwerth (*P. conglobata*, Buitendijk, 1945).

Piona conglobata (Koch, 1836) var?

Haarlem (*Acercus* spec., Buitendijk, 1945).

The addition "*Acercus* ?" in pencil on the slide is in Romijn's handwriting.

Piona spec. (nympha)

Arnhem (*Arrhenurus* spec., Buitendijk, 1945).

Piona spec.

The Oudemans Collection contains the unpublished drawing no. 1159, identified by Oudemans as *Piona nodata* O.F.M.; a locality is not mentioned. The specimen after which the drawing was prepared appears to be no more present. Buitendijk erroneously recorded the drawing as *Unionicola nodata*.

The palp as it is represented in the drawing appears to be a palp of *P. coccinea*; *P. nodata* partly belongs to the synonymy of this species. Of the acetabula on the genital plates, however, two are large and are situated in the centre, which points to *P. uncata*. It is, therefore, impossible to arrive at a final conclusion as to the identity of the figured specimen.

Axonopsidae

Brachypoda versicolor (O.F.M., 1776)

Sneek (*Br. versicolor*, Buitendijk, 1945).

Netherlands (not mentioned by Buitendijk).

Mideidae

Midea orbiculata (O.F.M., 1776)

Netherlands (*M. elliptica*, Oudemans, 1898; *M. orbiculata*, Romijn, 1916; not mentioned by Buitendijk). The specimen of this species is mounted together with *Brachypoda versicolor* and *Arrenurus sinuator* on one slide.

Mideopsidae

Mideopsis orbicularis (O.F.M., 1776)

Rosmalen (*M. orbicularis*, Buitendijk, 1945).

Arrenuridae

Arrenurus globator (O.F.M., 1776)

Sneek (*Arrenurus tuberculator*, Buitendijk, 1945).

Bovenkerk (*A. spec.*, Buitendijk, 1945).

Arrenurus buccinator (O.F.M., 1776)

Bremen (*A. caudatus*, Buitendijk, 1945).

Utrecht (*A. globator*, Buitendijk, 1945).

Arrenurus sinuator (O.F.M., 1776)

Netherlands (*A. sinuator*, Buitendijk, 1945).

Arrenurus bicuspidator Berl., 1885

Delden (*A. tricuspidator*, Romijn, 1916, *A. bicuspidator*, Buitendijk, 1945).

I am certain of the male specimen only; the identification of the ♀ is doubtful.

Arrenurus claviger Koen., 1885

Sneek (*A. emarginator*, Buitendijk, 1945).

Arrenurus spec.

Delden (*A. emarginator*, Buitendijk, 1945).

The slide contains 2 species.

Arrenurus spec.

Wijde Blik near Vreeland, in the stomach of *Abramis brama* (*A. forcipatus*, Buitendijk, 1945).

Three slides are present in the Oudemans Collection, but they certainly do not belong to *forcipatus*, recte *forpicatus*. P II has a so-called hair brush on the medial surface, extending over the dorso-distal part. P IV is ventri-distally slightly pointed, certainly not rounded. Besides the genital aperture the genital plates show a large triangular spot without acetabula; this state of things reminds one of *A. curvisetus* Viets, which is, however, a distinctly different species.

The mounted parts are not suitable for a complete description. Probably the material represents a new species.

Various larvae of Hydrachnellae

The external morphology of the larvae of Hydrachnellae enables us to recognize some distinctly different groups; three of these are present in the collection. The first group contains the larvae of the genus *Hydrachna*, immediately recognizable by the extraordinarily large capitulum. The second group embraces the larvae of the family Limnocharidae in the sense of the ancient authors, to which *Limnocharcs*, *Eylais*, the Thyasidae, the Hydryphantidae, and *Hydrodroma* belong. The general contour of these larvae is very irregular and they are strongly covered with hairs. The epimeres are not enlarged and medially they do not touch each other. The larvae of this group show distinct generic differences and sometimes it is even possible to recognize the species, so that it was possible to mention them above, together with the adults.

The third group contains the larvae of the Hygrobatidae in the sense of the ancient authors. They have a more regular contour (round or elliptical) and they are less strongly covered with hairs. The epimeres are always enlarged and sometimes they grow together to two pairs of shields, or even to one; the medial borders of the epimeres are straight, and often they are in contact with each other.

It is possible to distinguish four types among this group. The division does not completely correspond with the system of the adults, because up till now comparatively little attention has been paid to the larvae.

To the first type belong the larvae with 3 pairs of free epimeral shields (genera *Arrenurus*, *Midea*, and *Mideopsis*).

The second type is characterized by 2 pairs of epimeral shields, the second and the third shield having grown together; laterally a suture is, however, still visible (genera *Lebertia* (ad partem), *Frontipoda*, *Oxus*, *Teutonia*, *Unionicola*, *Neumania*, the Pionidae, and the Axonopsidae).

Larvae with only one pair of epimeral shields in which, however, a lateral suture is visible belong to a third type (genus *Limnesia*).

Finally there are larvae with two epimeral shields, without lateral suture (fourth type, genera *Hygrobates* and *Atractides*).

Oudemans in all probability identified the larvae in his collection with the aid of Piersig's „Deutschlands Hydrachniden" in which many larvae are represented. It is, however, impossible to confirm many of Oudemans's statements, and I give a list of a number of slides which must remain unidentified.

Type I

Beek near Breda (*Hydryphantes* spec., Buitendijk, 1945).

Doorwerth (*Diplodontus* spec., Buitendijk, 1945).

Sierakowitz, Nossi-Bé, Tonkin (*Midea* spec., Buitendijk, 1945).

Brussels (*Arrhenurus* spec., Buitendijk, 1945).

The doubt concerning the exactitude of the identification of the specimens from Nossi-Bé and Tonkin increases when one realizes that up till now species of *Midea* are only known from Europe and North America.

Type II

Arnhem (*Teutonia primaria*, Buitendijk, 1945).

Arnhem (*Limnesia* spec., Buitendijk, 1945).

Bussum and Bodegraven (*Unionicola crassipes*, Buitendijk, 1945).

Zwammerdam (*Axonopsis complanata*, Buitendijk, 1945).

The larva from Bussum, erroneously regarded as belonging to *Unionicola crassipes*, was found on *Chironomus tentans* Fabr. It was recorded by Oudemans in 1905 (p. 223).

There is also a larva from Bodegraven, erroneously identified with *U. crassipes*; this specimen was found on *Chironomus nebulosus*.

Oudemans certainly must have compared his larvae with fig. 5g on table III of Piersig's above-mentioned book, that represents a similar larva.

As Piersig suggested and later investigations have proved, the larvae of *U. crassipes* are, however, parasites of fresh-water sponges, so that the larvae on the Chironomidae certainly belong to a different species.

There is also an original drawing (no. 1158) regarded by Oudemans as representing a larva of *U. crassipes*; possibly it was prepared after one of the slides. A locality of the figured specimen was, however, not mentioned, and the identity is uncertain.

Type III

Larvae of this type are not present in the collection.

Type IV

Lake Jamoer (*Limnesia jamurensis*, Buitendijk, 1945).

Arnhem (*Limnesia* spec., Buitendijk, 1945).

Bodegraven (*Hygrobates longipalpus*, Buitendijk, 1945).

The larva of *Limnesia jamurensis* was described by Oudemans (1905, p. 223; 1906, p. 136, pl. 3 figs. 88-93). The type slide contains 5 larvae. They differ from the original description and figures in one important point. Oudemans (1906) described the coxisternal region as follows.

"Ventral side (Fig. 89). Coxal shields fused together on each side to one plate, leaving, however, distinct demarcations". (Oudemans then continues with the description of coxae I, II, and III).

It appears that Oudemans observed that the coxae or epimeres are grown together to one pair of shields, whilst in his fig. 89 he draws sutures between coxae I and II, and between coxae II and III. These sutures are, however,

invisible in the mounted larvae, and in my opinion Oudemans made an error when figuring these.

For unknown reasons Oudemans included the species in the genus *Limnesia*. If sutures were present the species should be placed in the genus *Arrenurus*. In my opinion the larvae, because they do not show sutures, can better find a place in the genera *Hygrobates* or *Atractides*, but it is also possible that they belong to a new genus.

Remaining larvae

It is impossible to identify 3 slides containing eggs, embryos, and larvae; they are mentioned on page 343 of Buitendijk's catalogue. Finally I have not been able to recognize the larvae from the following localities:

Velp (*Thyas longirostris*, Buitendijk, 1945).

Sierakowitz (*Hydryphantes gymnopteronum*, Buitendijk, 1945).

Tonkin (*Hydrochoreutes* spec., Buitendijk, 1945).

Tonkin (*Piona* spec. Buitendijk, 1945).

I draw attention to the fact that up till now no species of *Hydrochoreutes* have been recorded from Tonkin or S. E. Asia.

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