ontstaat op deze struiken een geslachtelijke generatie, waarbij het bevruchte wijfje dan één eitje legt op de takken van de struik en de cyclus begint opnieuw.

Paedogenesis. Hierbij produceren de larven reeds nieuwe individuen. Dit verschijnsel werd ontdekt door Wagner in 1862 bij de galmug *Miastor*. Het wijfje draagt 4—5 grote eieren, die zich in het moederlichaam ontwikkelen tot larven. Iedere larve vormt 7—30 nieuwe larven. Deze leven van de inhoud van de moederlarve en verlaten haar lichaam. Ze blijven doorgaan met larven te vormen en eerst na enige generaties verpoppen zij en vormen mannelijke of vrouwelijke galmuggen.

Polyembryonie: Hierbij ontstaan uit één ei meerdere individuen. Dit verschijnsel is bekend bij sommige parasitaire vliesvleugeligen o.a. *Ageniaspis fuscicollis,* die parasiteert bij de hermelijnvlinder.

Hermaphroditisme: Dit bestaat hierin, dat in een en hetzelfde individu mannelijke en vrouwelijke geslachtsorganen voorkomen. Normaal komt dit b.v. voor bij de schildluis *Icerya purchasi*. Deze leeft op citroenen. De eieren, die ontstaan door zelfbevruchting, leveren weer hermaphroditische individuen; die, welke niet bevrucht worden, groeien parthenogenetisch uit tot mannetjes. Er bestaat ook een partiëel hermaphroditisme, waarbij alleen uitwendige kenmerken van beide geslachten voorkomen. Als zodanig zijn de arrhenoide wijfjes bij *Dytiscus* op te vatten.

Aan het slot van zijn causerie laat spr. twee exemplaren zien van ♂ ♂ wandelende takken, eigenlijk geen ♂ ♂, maar hermaphrodieten, die hij zelf in 1948 gekweekt heeft. Na een korte gedachtenwisseling sluit de voorzitter de vergadering.

Mededelingen van de Commissie inzake Wetenschappelijk Onderzoek van de St. Pietersberg. No. 29.

SOME RANDOM NOTES ON THE MITE FAUNA OF LIMBURG WITH THE DESCRIPTION OF TWO NEW SPECIES

by

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I. Introduction.

In the early part of September of 1951, I had the pleasure of visiting the province of Limburg accompanied by Prof. Dr H. Boschma and Dr L. D. Brongersma of the Rijksmuseum van Natuurlijke Historie, Leiden. While we were in the environs of the castle of Neercanne we were able to do some desultory collecting of the free living and mostly plant inhabiting mites of the area. On subsequent examination most of the specimens taken proved to be fairly common and well known European mites, a few were representatives of described but little known species and two appeared to be new. In addition to the mites from Limburg I have included the report of a few species, which were again found on plants, but this time growing on the sand dunes of behind Noordwijk aan Zee, province of Zuid-Holland. Also some mites from Zaltbommel, province of Gelderland, are reported upon.

II. List of material collected.

A. From higher plants in Limburg.

Aesculus Hippocastanum L., Neercanne.
- *Typhlodromus finlandicus* (Oudms.)
- *Typhlodromus tiliae* Oudms.

Castanea sativa Mill., Neercanne.
- *Typhlodromus finlandicus* (Oudms.).

Catalpa bignonioides Walt., Neercanne.
- *Typhlodromus vitis* Oudms.
- *Trichoribates* cf. *trimaculatus* (C. L. Koch)*

Corylus Avellanus L., Savelsbos near Gronsveld.
- *Typhlodromus tiliae* Oudms.
- *Typhlodromus vitis* Oudms.

Dahlia sp., Neercanne.
- *Tetranychus urticae* Koch

Malva sylvestris L., Neercanne.
- *Typhlodromus finlandicus* (Oudms.)
- *Typhlodromus vitis* Oudms.

Prunus cerasus L., Neercanne.
- *Typhlodromus finlandicus* (Oudms.)
- *Allothrombium* sp. prob. *fuliginosum* Herm.
- *Metatetranychus ulmi* (Koch)
- *Bryobia praetiosa* Koch
- *Eporibatula plantivaga* (Berl.)*
- *Humerobates rostrolamellatus* Grandjean*

Prunus cerasus L., Neercanne area.
- *Typhlodromus tiliae* Oudms.
- *Metatetranychus ulmi* (Koch)

Pyrus communis L., Eckelrade.
- *Typhlodromus tiliae* Oudms.
- *Metatetranychus ulmi* (Koch)

Pyrus communis L., Neercanne area.
- *Phytoseius macropilis* (Banks) (= *spoofi* Oudms.).
- *Brevipalpus pyri* Sayed

Pyrus Malus L., Eckelrade.
- *Typhlodromus finlandicus* (Oudms.)
- *Metatetranychus ulmi* (Koch)
- *Bryobia praetiosa* Koch

Pyrus Malus L., Neercanne.

Typhlodromus tiliae Oudms.
Phytoseius macropilis (Banks) (= *spoofi* Oudms.)
Metatetranychus ulmi (Koch)
Bryobia praetiosa Koch
Quercus borealis Michx. var. *maxima* Ashe., Savelsbos near Gronsveld.
Typhlodromus tiliae Oudms.
Typhlodromus finlandicus (Oudms.)
Eotetranychus telarius L. (?)
Brachytydeus caudatus Dug. (= *spathulatus* Oudms.)
Salix alba L., Neercanne.
Schizotetranychus schizopus Zacher
Tilia platyphyllos Scop., Neercanne (castle garden).
Typhlodromus finlandicus (Oudms.)
Czenspinskia transversostriata (Oudms.)
Tilia platyphyllos Scop., Neercanne.
Typhlodromus vitis Oudms.
Humerobates rostrolamellatus Grandjean*
Ulmus campestris L., Molenberg near Bemelen.
Typhlodromus finlandicus (Oudms.)
Ulmus campestris L., Savelsbos near Gronsveld.
Typhlodromus tiliae Oudms.
Urtica dioica L., Neercanne (castle groves).
Garmania (Paragarmania) urticana n.sp.
Typhlodromus finlandicus (Oudms.)
Czenspinskia transversostriata (Oudms.)
Oribatid nymph, undetermined.
Vitis vinifera L., Neercanne (associated with eriophids).
Typhlodromus (Neoseiulus) soleiger (Ribaga)
Typhlodromus tiliae (Oudms.).
On ground in rotten fruit of *Aesculus Hippocastanum* L., Neercanne.
Pergamasus crassipes (L.)
Pediculoides spinosus (Kram.)
Rhizoglyphus solani (Oudms.)
Anoetus sp. (immature specimens)
Euzetes globulus (Nicolet)*
Nothrholaspis terreus (Can.)

B. From Fungi in Limburg.
Agaricus campester L. ex Fr. (cultivated variety), Neercanne (in caverns).
Parasitus coleoptratorum (L.) (Trägårdh's conception)
Arctoseius limburgensis n.sp.
Garmania bulbicola (Oudms.)
Eberhardia agilis (Can.)

C. From Mollusks in Limburg.
Helix pomatia L., Neercanne.
Riccardoella limacum (Schr.)

D. From higher plants outside Limburg.
Acer pseudo-platanus L., Noordwijk aan Zee.
Amblyseius similis (Koch)
Humerobates rostrolamellatus Grandjean *
Populus alba L., Noordwijk aan Zee.
Phytoseius macropilis (Banks) (= *spoofi* Oudms.)
Prunus serotina Ehrl., Noordwijk aan Zee.
Brachytydeus caudatus Dug. (= *spathulatus* Oudms.)
Quercus sp., Noordwijk aan Zee.
Humerobates rostrolamellatus Grandjean *
Rubus caesius L., Noordwijk aan Zee.
Typhlodromus (Neoseiulus) vepallidus (Koch).
Typhlodromus tiliae Oudms.
Salix cinerea L., Noordwijk aan Zee.
Phytoseius macropilis (Banks) (= *spoofi* Oudms.)
Eotetranychus tiliarum (Herm.)
Tilia europaea L., Zaltbommel.
Typhlodromus finlandicus (Oudms.)
Eotetranychus tiliarum Koch (= *E. telarius* Oudms.)

*) The oribatids were determined by Dr L. van der Hammen, Rijksmuseum van Natuurlijke Historie, Leiden.

III. Description of new species.

Arctoseius limburgensis n.sp.
(Plate I, figs. 1—6 incl.)

Female: Including the gnathosoma the body of the female of this species measures .428 mm. in length; exclusive of the mouthparts the idiosoma proper measures .36 mm. in length and .192 mm. in width. The dorsum (fig. 1) is oval in shape, deeply cleft (almost to one-third of the total width) on either side, and adorned with 32 pairs of short, slim, simple setae. As the drawing indicates the dorsal scutum appears to be free of imbrications but has a few rugose patches. The venter is covered by the sternal plate (fig. 4) which bears three pairs of setae in addition to a pore-like notch in the margin just anterad of setae three; a genital plate which is free of but flanked by two pairs of setae; and a small ovoid anal plate (fig. 6) bearing only three pairs of setae. The peritremal plate ends bluntly at the lateral edge of coxa IV but continues mesiad behind the coxa as a thin falcate plate. There is no trace of metapodal plates. Dorsally the gnathosoma is covered by a two toothed epistome (fig. 2), or tectum as Snodgrass (1948) calls it, and ventrally (fig. 5) by the hypostome which bears laterally a small scalpel shaped process (the corniculi maxillares of Vitzthum) and medially a slender process which is slightly barbed (laciniae malarum internarum of Vitzthum 1931). A note of explanation should here be interpolated about figure 5. On the right side of the drawing the ventral surface of the hypostome has been dissected away to shew the pectinate and tongue-shaped labrum (Snodgrass 1948). The fixed digit of the chelic-

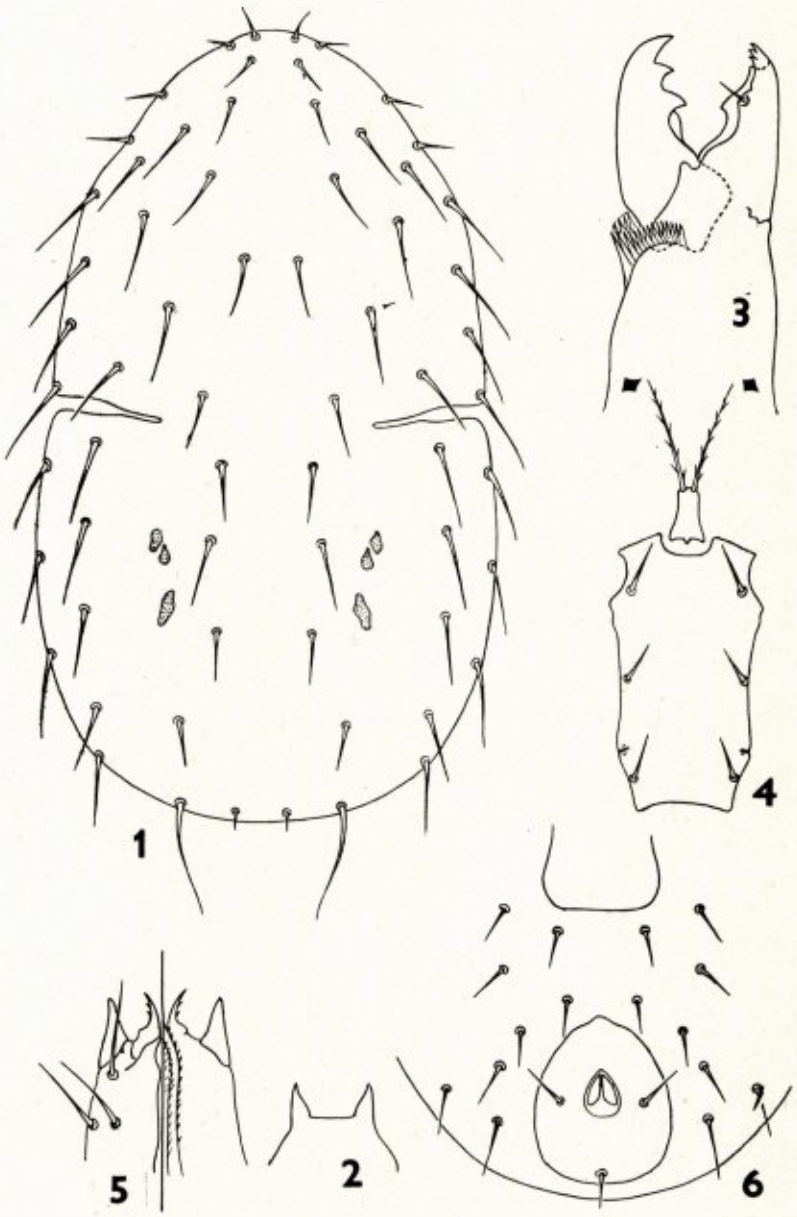

Plate I. *Arctoseius limburgensis* n.sp. (female).

Fig. 1. Dorsal scutum. Fig. 2. Dorsal view of tectum (epistome). Fig. 3. Lateral view of left chelicera. Fig. 4. Ventral scutum and tritosternum. Fig. 5. Ventral view of hypostome, left side entire, right side dissected away to shew the pectinate labrum. Fig. 6. Ventral view of terminal portion of opisthosoma shewing anal plate and surrounding setae.

era (fig. 3) bears in addition to the pilus dentilis three minute teeth at the tip; the moveable digit three large teeth. About the base of the moveable digit is a collarlike structure of closely set setae. The tarsus of the pedipalp bears mesially a two-tined seta, the tibia a pair of sharp stout setae just proximad of the membrane between the tarsus and the tibia; the genu two mesially directed sharp setae, and the femur a mesially directed stout unmodified seta. The tritosternum is composed of a fairly large base and two pectinate setae-like flagella. Exclusive of the claws and coxae the legs measure I-.22 mm., II-.144 mm., III-.192 mm., and IV-.268 mm. The tarsi of the three posterior pairs of legs are of interest in that the caruncle carries in addition to the claw proper a pair of laterally directed minute setae or processes.

Type Habitat: on *Agaricus campester* L. ex Fr. (cultivated variety). Cavern, Castle grounds, Neercanne, Limburg.

Holotype : Female, Neercanne, the Netherlands, Sept. 22, 1951. The slide has been provisionally deposited in the Canadian National Collection, Ottawa.

Notes: The taxonomic position of this species may best be expressed by relating it to kindred species described in Willmann's (1949) paper on the genus *Arctoseius*. By the use of his keys it is obvious that the species under consideration falls in the genus *Arctoseius* s.str. (vide couplet 8(3)) and that it is most closely related to that group of species which is included in couplets 12(9) et sequa, viz., *A. halophilus* Willmann, *A. cetratus* (Sellnick) and *A. bicuspidatus* Willmann.

To include the new species Willmann's key may be translated and amended as follows:

12(9) Without endopodialia 13
13(14) The first pair of sternal setae before the shield; the anterior lateral corners of the sternal shield strongly indented and scalloped; anal shield longer than wide . . *A. halophilus* Willmann
14(13) The first pair of sternal setae on the shield; anal shield as long [or slightly longer]* than wide . . . 15
15(16) Anterior margin of the sternal shield indistinct without lateral enlargements, genital shield also indistinctly limited; 2 setae on the hind margin of the body are significantly longer than the remaining; epistome with 3 spines . . . *A. cetratus* (Sellnick)
16(15) Anterior margin of the sternal shield distinct; epistome with only 2 spines 17
17(18) [Anterior third of the sternal plate expanded laterally as wing-like processes . . *A. bicuspidatus* Willmann
18(17) Anterior third of sternal plate not noticeably wider than remainder of plate . . . . *A. limburgensis* n.sp.]

*) Interpolation in square [ ] brackets.

Garmania (Paragarmania) urticana n.sp.
(Plate II, figs. 7—10 incl.)

Male: Including the gnathosoma the body of the male of this species measures .34 mm. in length; exclusive of mouthparts the idiosoma proper measures .27 mm. in length and .165 mm. in width. The dorsum (fig. 7) is roughly pear-shaped, mildly but none the less noticeably imbricate, and adorned with 33 pairs of setae which become successively coarser towards the posterior end and which measure on the average 20 μ in length. Four of the most posterior setae are approximately twice as long as the other dorsal setae and slightly pectinate. The venter is covered by the sternal plate (fig. 8) with five pairs of setae and two pairs of pore-like depressions, the ventrianal plate (fig. 9) with six pairs of preanal setae and the peritremal plates which end in falcate processes behind coxae IV. There is no trace of parapodal plates. The fixed digit of the chelicera (fig. 10) is provided with eight minute teeth, one closely associated with its tip and seven in a row beside the pilus dentilis. The movable digit bears the two jointed spermatophore spur and has only one tooth, which is more in the nature of an eminence rather than a definite tooth. On the other hand, the pedipalp has few, if any, distinguishing characters; the tarsus bears the usual two-tined seta; the genu, the closely approximated spatulate mesial setae; and the femur a conspicuous flattened blade-like mesial seta. Likewise, the gnathosoma proper varies little from the typical typhlodromid pattern. The flagella of the tritosternum are slight, flexible and moderately pectinate as is the base. Exclusive of the coxae and claws, the legs from I to IV measure res-

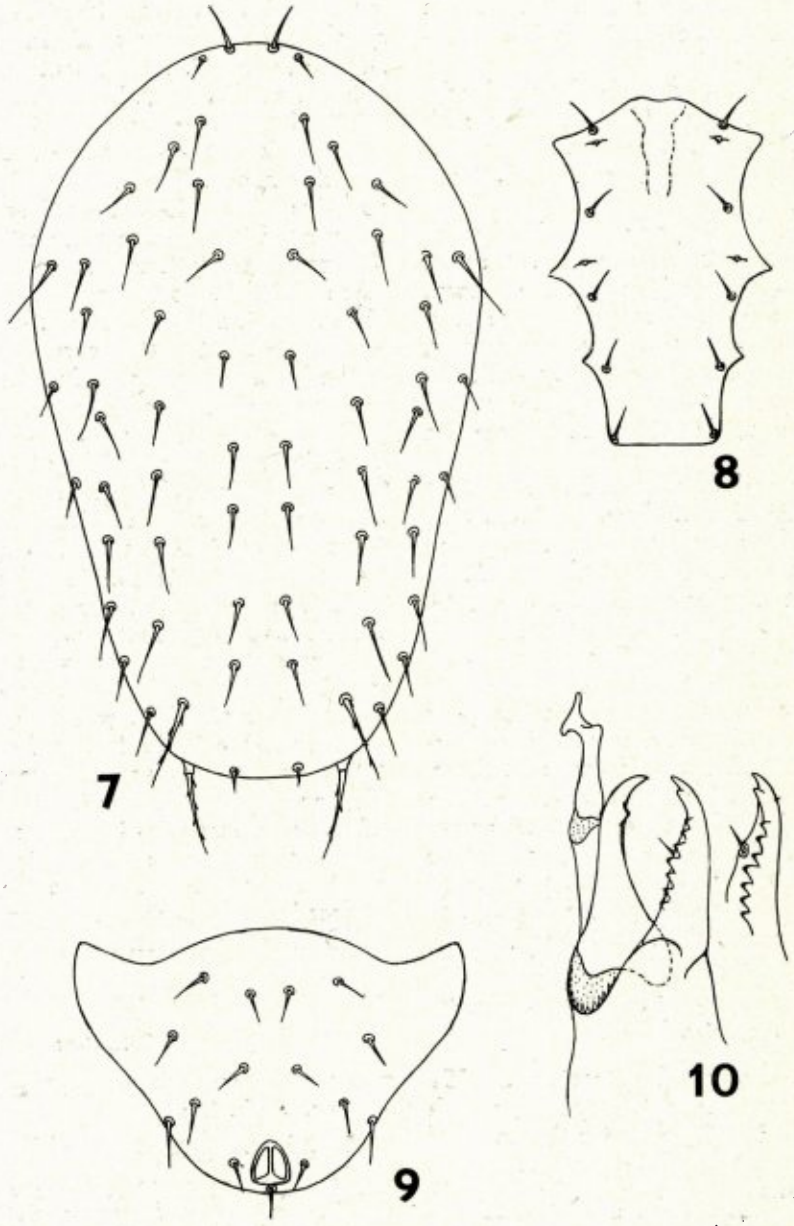

Plate II. *Garmania (Paragarmania) urticana* n.sp. (male).
Fig. 7. Dorsal scutum. Fig. 8. Ventral scutum. Fig. 9. Anal plate of male. Fig. 10. Chelicera of female showing spermatophore spur.

pectively: .228, .192, .184, and .27 mm. Leg IV, which is thus as long as the idiosoma, bears two coarse spine-like setae, one on the tarsus and the other on the subtarsus. Either of these is about one-half as long as a comparable seta which Oudemans shews on the subtarsus of leg IV of *P. amboinensis* (vide Nesbitt 1951, pl. XVIII).

Type Habitat: on *Urtica dioica* L., Castle grounds, Neercanne, Limburg, the Netherlands.

Holotype: Male, Neercanne, the Netherlands, September 12, 1951, (Coll. Prof. Dr H. Boschma). This slide has been provisionally deposited in the Canadian National Collection, Ottawa.

Notes: As until now the male of only one species of the genus *Garmania,* viz. that of *Garmania (P.) domesticus* (Oudms.), is known, it follows that the form described above may be one of these unknown males. When, however, the new species is compared critically with the known females discrepancies may be noted which are great enough to separate it from the known species.

In the first instance it should be noted that it differs from *G. (P.) domesticus* in having five rather than four sternal setae and somewhat longer and coarser dorsal setae. It is undoubtedly most closely related to either *G. (P.) amboinensis* or *G. (P.) mali* but differs markedly from the former and to a somewhat lesser degree from the latter in the chaetotactic pattern of the dorsum. In common with *G. (P.) mali* it has two pairs of pits on the sternal scutum between setae one and two and two and three. It differs from this species, however, in the totally different type of cheliceral dental armature (vide Nesbitt 1951, pl. XXIII). For these reasons the male described above is considered as representing a new species which because of its host plant has been called *"urticana".*

IV. Concerning the identity of three of Oudemans' species.

In discussing the genus *Phytoseius* in 1951 I made the statement that the species which Oudemans described in 1915 under the name of *Seiulus spoofi* was in all probability the same as that which Banks had previously (1909) described as *Sejus macropilis* but that as the American author's description was vague and that as his specimens no longer seemed to be available the point could not be settled. Since then Dr E. W. Baker of the United States National Museum has found Banks' type specimens in the Museum of Comparative Zoölogy at Harvard University and as he and I have come to the conclusion that the two species mentioned above are identical, I believe that *spoofi* should be placed in synonymy with Banks' *macropilis.* The matter, however, may not rest at this point because Berlese published a list of synonyms in 1918 in which he maintained without argument or explanation that *"Seiulus spoofi* Oudemans 1915 = *Phytoseius horridus* Ribaga 1902". As the arguments which I advanced in 1951 are still pertinent, to wit that Ribaga's descriptions are too vague to be of value and that his types are not available, I am of the opinion that Berlese's contention cannot be accepted but that it should be kept in mind in the hope that at some further time a solution to this problem may be found.

Concerning the other two species viz., *Seiulus finlandicus* Oudms. 1915 and *Seiulus rhenanus* Oudms. 1915 which Berlese placed in synonymy with *Seiulus curtipilus* Ribaga 1902 and *Iphidulus communis* Ribaga 1902 respectively, much the same arguments, I believe, hold. Had Berlese in his synonymic list stated that he had compared Ribaga's specimens with either Oudemans' type specimens or even with his drawings I would agree with him but as he withheld his comments until 1918, when Oudemans' figures were available in 1915, one feels that one has a right to question and entertain doubts, especially as I am of the opinion that if anything Ribaga's *communis* is closer to Oudemans' *Typhlodromus tiliae* than it is to *S. rhenanus.* Accordingly, in the above lists I have not accepted Berlese's synonymy and have retained the Oudemans names.

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