zoo stevig was de legboor hierin bevestigd. Pas na eenigen tijd was het dier weer los uit den stam, minder door mijn trekken, dan doordat het zichzelf scheen los te werken.

Vaak heb ik sluipwespen bezig gezien op boomstammen, waarbij ze dan steeds met hare legboor in reeds bestaande larvengangen rondtasten, zoodat ik, en naar mij bleek ook anderen, in de meening verkeerden, dat het slechts een sprookje was, dat sluipwespen de kunst verstaan zouden met de toch zoo dunne en buigzame legboor door het hout heen te boren. Uit bovenstaande waarneming bleek mij nu evenwel, dat althans *Rhyssa* hiertoe wel in staat is. Misschien dat deze waarneming ook voor anderen van belang is. Wie lost nu evenwel het raadsel op, op welke wijze de wesp er in slaagt, met zoo'n schijnbaar onbeteekenend werktuigje centimeters diep in het hout door te dringen?

Rotterdam, Juni 1924. A. J. ZÖLLNER.

Acarologische Aanteekeningen LXXVI.

Tyroglyphidae en Rhizoglyphidae. Zooals ik reeds in de Ent. Ber. v. 6. n. 137. p. 265 en 266 uiteenzette, kan het al of niet aanwezig zijn van carunculae niet meer als onderscheid tusschen *Tyroglyphidae* en *Rhizoglyphidae* in aanmerking komen. Terzelfder plaatse zeide ik ook: „De *Rhizoglyphidae* kent men aan de korte, sterk gedoornde pooten". Ja, maar, wat is sterk, wat is zwak gedoornd?!

Voor MICHAEL en andere acarologen, na hem, was het bestaan van heteromorphe mares voldoende, om eene Tyroglyphide onder *Rhizoglyphus* te brengen. In Maart 1916 wees ik er in de Ent. Ber. v. 4. n. 88. p. 268 reeds op, dat *Tyroglyphus kramerii* BERL. 1881 eveneens hetermorphe mares heeft, die zelfs sprekend op die van *Rhizoglyphus echinopus* FUM. & ROB. 1868 gelijken.

Zoo valt het eene onderscheidingskenmerk na het andere. En toch zijn de *Rhizoglyphidae* zóó typisch, dat de familie mijns inziens recht van bestaan heeft. Ik heb naar onderscheidingkenmerken gezocht, en ik heb ze gevonden.

De beteekenis der nuchaalhaartjes voor de systematiek. Het is mij opgevallen, dat de nuchaalhaartjes

bij sommige genera ontbreken; zie daarover Ent. Ber. v. 6. n. 136. p. 249, alwaar echter »*Anoetus*« geschrapt moet worden. Bij de genera, bij wie zij wèl voorkomen, staan zij op twee verschillende plaatsen en hebben ook twee verschillende vormen. Ik veroorloof mij, daaraan groote beteekenis te hechten.

Klauw en carunkel. De klauw behoeft niet aanwezig te zijn; maar waar hij wèl aanwezig is, daar is ook eene carunkel. De pees, die den klauw met de klauwspier verbindt, loopt door die carunkel. Soms is die pees zóó kort, dat de klauw sessiel genoemd wordt, en dan kan de carunkel zóó klein zijn, dat zij schijnbaar ontbreekt. Soms is de pees lang, en dan schijnt het, alsof de klauw op de carunkel ingeplant is. Soms is de klauw zeer klein en gedeeltelijk in de carunkel verzonken. Zelfs bij *Lentungula*, waar de klauw langgepeesd („langgesteeld") is, daar loopt de lange pees door eene buisvormige carunkel, die aan het einde drielobbig verbreed is; op de distale mediane lob is de klauw bewegelijk ingeplant. Tusschen die uitersten zijn vele „overgangen", zelfs in ééne familie, zoodat in enkele gevallen die kenmerken ons in den steek laten.

Zeer naverwante genera kunnen al of niet eene **scheidingslijn** tusschen propodo- en hysterosoma vertoonen (*Lentungula* en *Hyadesia*, *Chaetodactylus* en *Sennertia*, *Anoetus* en *Zwickia*). Eene scheidingslijn is derhalve, tot dusverre, niet geschikt, om families te karakteriseeren.

Het resultaat van die overwegingen is eene nieuwe rangschikking der genera, een nieuwe „sleutel". Eenige genera ken ik niet door eigen aanschouwing. Ware dat het geval, de sleutel zou er zeker anders uitzien.

Diacrotricha Oudms. 1906.

A. 1. Skin (except in a few nymphae, incl. hypopi) not finely wrinkled or striated (MURRAY 1877).

B. 1. Mandibles chelate.

C. 1. Ambulacra with (so called) sessile claw, with or (so called) without sessile caruncle; body more or less *Tyroglyphus*-shaped;

with line of demarcation between propodo- and hysterosoma; with propodosomatic shield (if not visible, use 1% caustic kali); ♀ genital aperture between coxae III and IV.

D. 1. The longer body-hairs are loose, whip-shaped.

E. 1. ♂ with suckers near anus and on tarsi IV. Larvae with „Brust-stiele".

F. 1. Nuchal hairs dorsal, on the level of trochanteres I, minute, smooth, or absent. Skin polished.

G. 1. Legs without or with spines; if present (pay attention to underside of tarsi!) they may be long, but are never robust; before the olfactoric club on tarsi I and II no spine. *Tyroglyphidae* DONN. 1868.

G. 2. Legs short and thick, with robust spines; before the olfactoric club on tarsi I and II such a spine. *Rhizoglyphidae* OUDMS. 1923.

F. 2. Nuchal hairs marginal on a level before trochanteres I; skin polished or granulated; moreover as G. I. above. *Tyrophagidae* **nov. fam.**

E. 2. ♂ without suckers near anus, nor on tarsi IV; Larvae without

„Bruststiele"(?); skin polished. *Saproglyphidae* **nov. fam.**

D. 1. Body hairs rather short, hairy bristles; body elongate, like in *Histiogaster corticalis,* with a constriction behind legs IV; skin polished; Genus *Acaridina* VAN BEN. 1870.

C. 2. Ambulacra with caruncle only; tarsi ending claw-like; skin polished; body more or less *Tyroglyphus*-shaped, with line of demarcation between propodo-and hysterosoma; propodosomatic shield(?[1]); ♀ genital aperture between coxae IV; ♂ with anal suckers, but without suckers on tarsi IV. *Nanacaridae* OUDMS. 1923.

C. 3. Ambulacra with more or less (so called) pedunculated caruncle (i.e. in the proximal part narrow, in the distal part enlarged), on the distal half or on the end of which the claw (often minute) is attached.

D. 1. Skin polished; body *Tyroglyphus*-shaped, with line of demarcation between propodo- and hysterosoma; with propodosomatic shield.

E. 1. ♀ genital aperture between coxae IV; ♂ unknown. *Winterschmidtiidae* OUDMS. 1923.

E. 2. ♀ genital aperture between coxae III; ♂ without suckers near anus, nor on tarsi IV. *Ensliniellidae* VITZTHUM 1924.

D. 2. Skin polished; body more or less *Tyroglyphus*-shaped; without propodosomatic shield(?); Larvae without „Bruststiele". A heterogenous group. *Carpoglyphidae* OUDMS. 1923.

1) My preparations are to old to enable me to settle the question.

D. 3. Vide B. 4. on p. 227 of Ent. Ber. v. 6. n. 135. Larvae with „Bruststiele". *Glycyphagidae* BERL. 1887.

D. 4. Vide B. 5. on p. 227 of Ent. Ber. v. 6. n. 135. *Canestriniidae* BERL. 1884.

D. 5. Skin polished, well chitinized; body oval or fusi form; without line of demarcation between propodo- and hysterosoma; without propodosomatic shield; gnathosoma hidden and partly sunk into a hole on ventral side of propodosoma (a camerostome as in *Oribatei*). *Chortoglyphidae* BERL. 1897.

D. 6. Skin polished; caruncle of legs I and II long and flexible, tubular, arising from side of claw-shaped tarsus; claw on the end of this caruncle; body not *Tyroglyphus*-shaped; with or without line of demarcation between propodo- and hysterosoma; with propodosomatic shield; Larvae without „Bruststiele" Aquatic habits. *Lentungulidae* BERL. 1897.

B. 2. Mandibles saw-, knife-, or stylet-shaped; body different-shaped; with or without line of demarcation between propodo- and hysterosoma; with or without propodosomatic shield; maxillae with two „flagellae" each; legs I and II almost marginal; ambulacra with „sessile" claw and minute caruncle; ♀ genital aperture a transverse slit between propodo- and hysterosoma (like in *Acaridae*, olim *Sarcoptidae*); with suckers between coxae II and III and between coxae IV; ♂ with 4 suckers in quadrant between coxae III and IV, without suckers on tarsi IV. *Anoetidae* OUDMS. 1904. (incl. *Nodipalpidae* OUDMS. 1923.)

A. 2. Vide Ent. Ber. v. 6. n. 135. p. 227.

Fam. Tyroglyphidae Donn. 1868.

A. 1. With propodo- and hysterosomatic shield. *Stereoglyphus* BERL. 1923.

A. 2. With propodosomatic shield; ♂ moreover with opisthosomatic shield; hind part of propodosoma with transverse row of 2 hairs only; ♂ tarsi IV? *Histiogaster* BERL. 1883 (incl. *Monieziella* BERL. 1898.)

A. 3. With propodosomatic shield only.

B. 1. Hind part of propodosoma with transverse row of 6 hairs; legs short and thick, without any spines. Only Larvae and Nymphae I known. *Valmontia* OUDMS. 1923.

B. 2. Hind part of propodosoma with transverse row of 4 hairs, of which the inner pair may be minute.

C. 1. Skin polished; legs normal; legs I may be thicker; with, though not robust, spines (pay attention to ventral side of tarsi); mandibles normal; claws without ventral knob.

D 1. Propodosoma with transverse row of 4 hairs almost equal in length; hysterosoma with short bristles; 4 long posterior marginal hairs; tarsi dorsally without spines, ventridistally with 1 little spine; ♂ tarsus I ventridistally with 2 little spines one behind the other: *Tyroglyphus* LATR. 1795, type *Acarus farinae* L. 1758 (incl. *Acotyledon* OUDMS. 1902.

D. 2. Propodosoma with transverse row of 4 hairs, the inner two shorter; hysterosoma with short bristles and longer hairs; tarsi dorsidistally with 1 little spine, ventridistally with 3–5 little spines; tarsi I, II and IV ventrally in the middle with 2 spines, III with

one; tibiae I, II ventridistally with 2 spines, III, IV with one; *Caloglyphus* BERL. 1923.

C. 2. As C. 1. but claws with ventral knob. *Olafsenia* **nov. gen.** Type *Tyroglyphus trifolius* OUDMS. 1901. Vide Tijds. Ned. Dierk. Ver. s. 2. v. 7. p. 53. t. 3. f. 57-61. and Ent. Ber. v. 6. n. 136. p. 255.

C. 3. Skin polished; legs short and thick, without spines; hairs on dorsum short and fine; Larvae and ♀ unknown; ♂ mandibles robust. *Ceroglyphus* VITZTHUM 1919 (syn.: *Petzschia* OUDMS. 1923.[1])

C. 4. Skin finely granulated; legs normal; mandibles normal; hairs on hysterosoma minute; tarsi I, II, III ventridistally with 3 little spines. *Suidasia* OUDMS. 1905.[1]) (syn.: *Aphelenia* OUDMS. 1923.[1])

Probably here is to be intercalated the genus *Froriepia* VITZTHUM 1919, based on hypopus with long and slender claws.

Fam. Rhizoglyphidae Oudms. 1923.

A. 1. Propodosoma with transverse row of 4 hairs, of which the inner pair may be minute, or of two (outer) hairs only, with minute nuchal hairs, pseudostigmatic and clasping organs; anterior half of hysterosoma with 4 hairs arranged in quadrant; tarsi with 2 ventridistal more or less lanceolate hairs; ♂ without opisthosomatic shield. *Rhizoglyphus* CLAP. 1869.

A. 2. Propodosoma with transverse row of 2 hairs only; without nuchal hairs, pseudostigmatic nor clasping organs; anterior half of hysterosoma bare; tarsi without lanceolate hairs; ♂ with opisthosomatic shield. *Schwiebea* OUDMS. 1916.

Here probably are to be placed the genera *Garsaultia* OUDMS. 1916 and *Sancassania* OUDMS. 1916, based on hypopi.

1) Under the name of „male" I described and figured a Nympha III!

Fam. Tyrophagidae Oudms 1924.

A. 1. Skin polished; nuchal hairs strong, hairy.

B. 1. Propodosoma with transverse row of 4 hairs almost equal in length; hysterosoma with 1 pair of short bristles, moreover with longer hairs; tarsi dorsidistally with little spine, ventridistally with 3–5 spines. *Tyrolichus* OUDMS. 1924.

B. 2. Inner pair of transverse row longer; hysterosoma with 2 pairs of short bristles, moreover with longer hairs.

C. 1. Tarsi dorsidistally with 1 spine, ventridistally with 3–5 spines. *Tyroborus* **nov. gen.** Type *Tyroborus lini* **nov. spec.**

C. 2. Tarsi dorsidistally without spine, ventridistally with 3–5 spines.

D. 1. Claw and caruncle normal; maxillar plate normally cleft (ω); in adulti hairs on coxae III and IV short; *Tyrophagus* OUDMS. 1924.

D. 2. Claws short; caruncle minute; maxillar plate deeply cleft, almost until base of palps; in adulti hairs on coxae III and IV long. *Povelsenia* **nov. gen.** Type *Tyroglyphus neotropicus* OUDMS. 1916.

A. 2. Skin granulated; nuchal hairs short and smooth; propodosoma with transverse row of 4 hairs, the inner pair shorter (bristles); hysterosoma with 2 pairs of bristles far forward and 2 pairs far backward; tarsi dorsidistally without spines, ventridistally with 3–5 spines; claws short; caruncle minute; maxillar plate deeply cleft, almost until base of palps; in adulti the hairs on coxae III and IV are short bristles. *Ebertia* **nov. gen.** Type *Tyroglyphus australis* OUDMS. 1916.

Fam. Saproglyphidae Oudms. 1924.

A 1. Propodosoma with transverse row of 4 hairs; hairs normal; legs normal; without caruncle (?); coxae normal; ♀ without postanal shield. *Saproglyphus* BERL. 1890.

A. 2. Propodosoma with transverse row of 4 hairs; hairs thick and hairy; joints of legs with raised lines; tarsi with caruncle and claw; coxae III well defined; ♀ with little round postanal shield. *Scatoglyphus* BERL. 1913.

Fam. Winterschmidtiidae Oudms. 1923.

In Ent. Ber. v. 6 n. 135. p. 231. strike out A. 3., as the genus *Aphelenia* has proved to be synonym with *Suidasia.*

Fam. Ensliniellidae Vitzthum 1924.

Here probably are to be placed the genera *Vidia* OUDMS. 1905, *Tortonia* OUDMS. 1911 and *Horstia* OUDMS. 1905, based on hypopi.

Fam. Mealiidae Oudms. 1923.

Meanwhile, by the kindness of Prof. Dr. E. L. TROUESSART in Paris, I was in the occasion to examine the microscopical preparation of *Mealia pteronyssina* TRT. So I am able to ascertain myself of the fact, that the genus *Mealia* does not belong to the *Tyroglyphidae* sensu lato, as hitherto accepted, but to the *Anacrotricha* OUDMS. 1906, more in particular in the neighbourhood of the *Avenzoariinae* OUDMS. 1906. The family of the *Mealiidae*, nevertheless, may be kept.

Fam. Nodipalpidae Oudms. 1923.

KARPELLES (in Math. Naturw. Ber. Ung. v. 11. 1893. p. 128. t. 18. f. 7. 7a. 7b.) describes and figures the genus *Nodipalpus* and the species *ulmi* very superficially. His drawings are bad. In the Tijds. Ned. Dierk. Ver. s. 2. v. 8. p. XV. 1902. and in the Tijds. Ent. v. 46. p. 8. 1903. I uttered the supposition, he had under his eyes an *Anoetus*, so that we must adopt the species *Anoetus ulmi* KARPELLES 1893.

In the Ent. Ber. v. 6. n. 132. July 1923. p. 182. I changed my opinion and said: The clavate palps, the stout

legs, the long tactile hairs on the 3d. article of the legs (read 4th, for he evidently overlooked the short trochanter) are decidedly not *Anoetus*-like. Also the claws are, as to me, too big for the genus.

And in the Ent. Ber. v. 6. n. 133. Sept. 1923. p. 206. I proposed the new family of *Nodipalpidae* to receive the only known genus.

Now, whilst engaged in setting down my „Key" above, I again read KARPELLES' description and studied his bad figures. In his description the words: „Manche Exemplare haben an der Bauchfläche des Cephalothorax die beiden Stielchen, wie sie die sechsfüssigen Larven mancher Tyroglyphen zeigen", struck me again. I could not make it out! But, some days afterwards, I studied the different species of *Anoetus*, delineated by BERLESE in his main work Acari, Myriopoda et Scorpiones. I was suddenly struck by his tabula of *Hypopus fimetarius* (IX, 7), where he figures the ventral surface of a ♂ with such „Stielchen". Also in his fig. 5 such an organ is given separately, more magnified. At once I conceived, that my old supposition of 1902 was the right one, and that I was wrong in changing it in the past year. Comparing now KARPELLES' description and figures with those of BERLESE, I now am convinced of it, that *Nodipalpus* is synonym to *Anoetus*, and *Nodipalpus ulmi* with *Anoetus fimetarius*. So the family *Nodipalpidae* falls, being synonym to *Anoetidae*.

Twice I kindly begged to pray the Director of the Natural History Museum in Budapest to send me KARPELLES' preparations, in order to examine them. My letters seem to have not reached him.

Fam. Anoetidae Oudms. 1904.

To the known characteristics (vide: Ent. Ber. v. 6. n. 135. p. 227) add: No pseudostigmatic organs. No clasping organs. The vertical hairs are short, placed on the foremost edge and bent downwards, or they are absent by caducity. What hitherto has been considered as vertical hairs are the nuchal ones. The ♀ genital aperture is a transversal slit between propodo- and hysterosoma, as I have, in truth, already in 1916 pointed out in *Anoetus guentheri*, at present

called *Zwickia guentheri.* The transverse slit is easily to recognize in individuals, cleaned and somewhat swollen by 1% caustic kali. BERLESE in *A. muscarum* (Ac. Myr. Scorp. Ital. 39. 9) took the anus for the genital aperture, and figures in *A. fimetarius* (l. c. 9. 7.) a longitudinal slit, that does not exist. MICHAEL (Brit. Tyrogl. v. 1. p. 205) says: „The vulva is a mere longtudinal slit with protecting sclerites" that, in reality, do not exist. And of the species *feronarium* (called by him *rostroserratus):* „The vulva is placed just posterior to the coxae of the fourth pair of legs..... much further from the posterior margin; it is a mere slit, without chitinized labia, and is offen difficult to see". Of the vulva of *pyriforme* „between the epimera of the third pair of legs". And yet there existed already in 1897 a drawing, representing a ♀ *Anoetus,* viz. in BERLESE's Ordo Cryptostigmata (Sarcoptidae), tab. XV, f. 6, where a tranverse slit on the right place is visible, without any explanation, however!

A. 1. With line of demarcation between propodo- and hysterosoma. *Anoetus* DUJ. 1842.

A. 2. Without such line. *Zwickia* **nov. gen.** Type *Anoetus guentheri* OUDMS. 1916. Probably hereto also *A. muscarum* L. 1758, which I have not had under examination.

Arnhem. A. C. OUDEMANS.