©Zoologisches Museum Hamburg, www.zobodat.at

ENTOMOLOGISCHE MITTEILUNGEN
aus dem
Zoologischen Museum Hamburg
Herausgeber: Professor Dr. Hans Strümpel, Dr. Gisela Rack,
Professor Dr. Walter Rühm
Schriftleitung: Dr. Gisela Rack
ISSN 0044-5223 Hamburg
6. Band 15. September 1978 Nr. 101

Five new larval Trombiculidae (Acarina) from Liberia and one from Zaire

MARIA KOLEBINOVA and VERCAMMEN-GRANDJEAN, P.H.

(With 9 plates)

Abstract

Eight Trombiculid larvae belonging to three genera, *Neotrombicula, Schoengastiella* and *Gahrliepia,* are described and illustrated. Six of them are new species; five originate from Liberia and one from Zaire. All are parasites of rodents pertaining to the same genus, *Lophuromys*. The classification of Trombiculinae and Gahrliepiinae is partially and briefly recalled, including the erection of one new generic and seven subgeneric taxa.

Résumé

Huit Trombiculidés larvaires appartenant à trois genres, *Neotrombicula, Schoengastiella* et *Gahrliepia,* sont décrits et illustrés. Six d'entre-eux sont des espèces nouvelles; cinq proviennent du Liberia et un du Zaire. Tous sont parasites de rongeurs d'un même genre, *Lophuromys*. La classification des Trombiculinae et des Gahrliepiinae est partiellement et brièvement rappelée et de nouveaux taxa, un générique et sept subgénériques, sont présentés.

Zusammenfassung

Acht Trombiculiden-Larven, die zu den drei Gattungen *Neotrombicula, Schoengastiella* und *Gahrliepia* gehören, werden beschrieben und abgebildet. Sechs von ihnen sind neue Arten; fünf stammen aus Liberia und eine aus Zaire. Alle sind Parasiten von Nagetieren der Gattung *Lophuromys*. Die Klassifikation der Trombiculinae und Gahrliepiinae wird ins Gedächtnis zurückgerufen. Außer den sechs neuen Arten wird eine neue Gattung und eine neue Untergattung beschrieben.

©Zoologisches Museum Hamburg, www.zobodat.at

The Liberian material was collected from rodents, *Lophuromys sikapusi,* captured on the 16th of October, 1970, in Njeble (Liberia), by Mr. H. VOELKER (Hamburg, Germany). The Zairian specimens (113) were gathered by the junior author from the ears of two *Lophuromys aquilus,* trapped on 8 & 15 of September, 1952, in Kindu (Kivu Province, Zaire), by Mr. J. WOLFS (Hygienist).

For reason of comparative morphology, two species are here redescribed and illustrated, *Trombicula nyongae* TAUFFLIEB & MOUCHET,1959, and *Schoengastiella caecea* ANDRÉ,1951.

We want to express our warmest thanks to Dr. F. LUKOSCHUS, at the Catholic University of Nijmegen, and to Dr. G. RACK, at the Zoological Institute & Museum of the University of Hamburg (Germany), for the precious material they submitted to us for study.

List of species:

1 - *Neotrombicula (Tauffliebicula) lophuromyia* n.sp.
2 - *Neotrombicula (Tauffliebicula) liberia* n.sp.
3 - *Neotrombicula (Tauffliebicula) nyongae* (TAUFFLIEB et al.,1959)
4 - *Schoengastiella (Dureniella) ocellata* n.sp.
5 - *Schoengastiella (Dureniella) subcaeca* n.sp.
6 - *Schoengastiella (Dureniella) caeca* (ANDRÉ,1951)
7 - *Gahrliepia (Gateria) megaspis* n.sp.
8 - *Gahrliepia (Giroudia) liberiensis* n.sp.

These eight species belong to two different subfamilies : Trombiculinae for the three foremost, and Gahrliepiinae for the five others. The classification of these two groups will be partly and succinctly recalled. Among the Trombiculins one new genus, *Afrotrombicula,* and two subgenera, *Afrotrombicula* and *Tauffliebicula* will be erected. As for the Gahrliepiins : 1) the genus and subgenus *Schoengastiella* will be redefined, and two new subgenera created, *Radfordiella* and *Dureniella;* 2) the genus *Gahrliepia* and three of its subgenera will be redifined, *Gahrliepia, Gateria* and *Giroudia.*

Subfamily T r o m b i c u l i n a e EWING,1929

Classified under this wide subfamily, are two important generic complexes: *Neotrombicula* and *Schoengastia,* both rising out a common phylogenic line, starting with the genus *Guntheria* WOMERSLEY,1939.

The *Neotrombicula* complex - of which a needed and detailed revision is in preparation -, gathered till now three genera:

I - *Blankaartia,* with two subgenera,
II - *Crotiscus,* with three subgenera,
& III - *Neotrombicula,* with eleven subgenera.

To these genera we here add a new one:

IV - *Afrotrombicula,* justified by a general morphology, common to 25 species of the Ethiopian, rather different from that of the *Neotrombicula* found in other zoogeographical regions of the World. These 25 species are arranged into three subgenera: A. *Afrotrombicula* nov., B. *Tauffliebicula* nov., & C. *Machadella* TAUFFLIEB,1965.

©Zoologisches Museum Hamburg, www.zobodat.at

Genus *Afrotrombicula* nov.

H i s t o r y & D i s c u s s i o n: From their first finding, the *Neotrombicula* of the Ethiopian Region proved to be different. Robust and strongly sclerotized, with a large and densely porous scutum, their SB line lays between the AL and PL lines - due to a wider distance between the anterolateral setae -, and the two lateral scutal margins are almost parallel. Their body setae are thick and strongly barbed, and their galeal setae (= protorostralae) are abundantly branched. Robust also are the claws, the two odonti (palpal claws) and the undented chelostyles. One nude mastitarsala is present on each hind leg, except in *Tauffliebicula*.
There are five peripheral setae on scutum, except in *Machadella* where the anteromedian seta (AM) is missing (observation on numerous specimens).

From 1952 on, V-G. collected a respectable amount of these chiggers, and reared a certain number of them to nymph. Unfortunately, due to exterior pressures, he never got the occasion to publish any of them. Meanwhile, R. TAUFFLIEB in Brazzaville (ex-French Congo), collected on his part a certain number of the same species. This statement is necessary to explain that V-G. sent prematurely a certain number of his specimens to various colleagues, and that these slides are labelled with unpublished names, of which some are today synonyms of TAUFFLIEB's species. In the projected revision, that situation will be duly amended.

A. Subgenus *Afrotrombicula* nov.

S y n o n y m y: *Trombicula,* EWING, 1928.
Neotrombicula, TAUFFLIEB, 1958.
" Af* ", V-G., 1973.

G e n e r o t y p e: *Trombicula nigeriensis* EWING,1928 (see scutum on Pl. 9).

D i a g n o s i s: *Afrotrombicula* of medium to large size, Ip = 750-1120; SIF = 7B.S-B-3-3111.1ooo ; fPp = B/B/NNB (constant). - Scutum: subpentagonal to subhexagonal, strongly sclerified and densely porous (like other sclerotized parts of the body, and appendages); bearing 2 slender and branched trichobotheria (sensillae), and 5 peripheral barbed setae, SB line between AL and PL lines (wide A-P). - Eyes: 2x2 corneas. - Protorostralae (galeal setae): well branched. - Odontus (palpal claw): strong, with the external prong near its base. - Chelostyles: solid, with a tricuspid cap, and no extra-dents. - Mastitarsala: always one on each hind leg.- Pedogenualae : 3.1.1. Body setae number,NDV = 64 to 110.

H o s t s: Mammals (including monkeys), and birds.

D i s t r i b u t i o n: Ethiopian Region.

S p e c i e s: 5 described, 10 unpublished (coll. V-G.); several nymphs are known.

©Zoologisches Museum Hamburg, www.zobodat.at

B. Subgenus *Tauffliebicula* nov.

S y n o n y m y: " M* ", V-G., 1973.

S u b g e n e r o t y p e: *Trombicula nyongae* TAUFFLIEB & MOUCHET,1952.

D i a g n o s i s: *Afrotrombicula* of medium size (close to large), Ip = 880-990. SIF = 7B.S-B-3-3111.0ooo ; fPp = B/B/NNB (constant). - Scutum: Subsquare to subtrapezoidal, smaller than in *Afrotrombicula;* bearing 2 slender and branched (few) trichobothria, and 5 peripheral barbed setae; SB line well before the PL line, wide A-P. - Eyes: 2x2 corneas. - Protorostralae: well branched. - Odontus: like in *Afrotrombicula*. - Chelostyles: like in *Afrotrombicula*. - Mastitarsala: absent. NDV = 78-88.- Pedogenualae: 3.1.1.

H o s t s: Mammals.

D i s t r i b u t i o n: Ethiopian Region.

S p e c i e s: 3 described hereafter, plus : *N. machadoi* TAUFFLIEB,1962, and *N. sciuri* TAUFFLIEB,1966.

D i s c u s s i o n: The erection of this group is substanciated by sensible morphological differences with the other *Afrotrombicula,* such as narrower and more square scuta, and no mastitarsalae on hind legs.

1 - *Neotrombicula (Tauffliebicula) lophuromyia* n.sp.

(Plate 1)

H o l o t y p e: L:15953/A/5, deposited with paratypes in the Museum of Tervuren (Belgium). Total number of paratypes, 112.

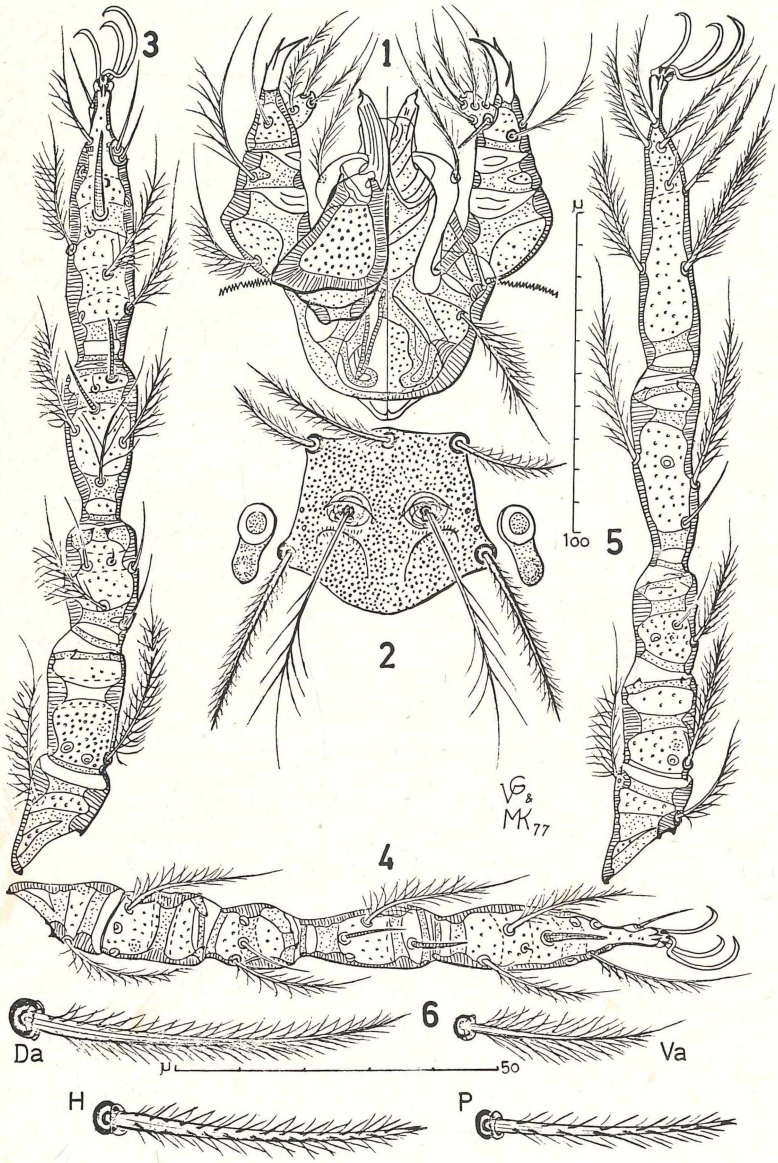
D e s c r i p t i o n: *Tauffliebicula* of medium size, Ip = 923-962. SIF = 7B.S-B-3-3111.0ooo ; fPp = B/B/NNB.- Scutum: subpentagonal with prominent, rounded posteromargin; dense porosity, large pores; bearing 2 slender trichobothria (78-92 µm) with 6-9 branches, and 5 bushy peripheral setae.- Eyes: a pair of anterior corneas (Ø 12 µm) plus intracutaneous posterior structure; total length 24 µm. - Body setae: fD = 2H+6.6.6.8.6.4.2 = 40, fv = 8.8.6.4u8.4.4.2 = 44 (u stands for uropore), NDV = 84.- Chelicera: strong chelobase with sinuous external flap, large pores; chelostyle potent (36 µm long).- Galeala: long (46 µm), with 16 to 22 branches.- Palp: strongly sclerotized like the chelobase (80 µm long); palpotarsus thumb-like (13x8 µm) with 7 branched setae, 1 subterminala (S = 13 µm), and 1 basal soleni-

---

Plate 1. *Neotrombicula (Tauffliebicula) lophuromya* n.sp.
1 - Gnathosome. 2 - Scutum. 3 - Front leg (dorsum). 4 - Middle leg (dorsum). 5 - Hind leg (profile). 6 - Body setae; Da = anterodorsal, H = humeral, P = pygosomal, Va = anteroventral (magnified twice).

©Zoologisches Museum Hamburg, www.zobodat.at

Neotrombicula (Tauffliebicula) lophuromya



©Zoologisches Museum Hamburg, www.zobodat.at

dion (S_o= 13 µm).- Odontus: or palpal claw, powerful and tripronged (25 µm long), the outer prong very basal.- Anterior leg: solenidion S_1 = 27 µm, famulus f_1 = 2 µm, subterminala ST = 27 µm, parasubterminala pST = 14 µm, pretarsala PT' = 18 µm, tibialae ta = 19 & 21 µm, microtibiala µt = 6 µm, genualae ga = 24/21/21 µm, microgenuala µg = 6 µm.- Middle leg: solenidion S_2 = 16 µm, famulus f_2 = 2 µm, pretarsala PT" = 16 µm, tibialae tm = 16 & 19 µm, genuala gm = 21 µm.- Posterior leg: tibiala tp = 25 µm, and genuala gp = 24 µm.

All three legs are 7-segmented, strongly sclerotized, provided with a constant number of pennate setae (see LST), and terminated with, long and powerful, 2 claws and 1 empodium, on a small membranous pretarsus. Pedocoxalae, fCx = 1.1.1. Pedotrochanteralae, fTr = 1.1.1. Sternalae, fSt = 2.2. Coxae: 64/64/60 µm long.

LST:	pa	pm	pp
T	22	16	15
t	8	6	6
G	4	3	3
F	6	6	5

M e a s u r e m e n t s: of the holotype (HT), plus means (M/20) and extremes observed (Ex +, Ex -) of 20 paratypes (all in micra).

	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	S	H	D	P	V	pa	pm	pp	Ip
HT:	48	61	24	25	32	57	34	49	29	54	85	48	61	48	37	30	42	324	284	324	932
M/20:	49	62	22	24	32	56	33	51	29	54	84	49	58	48	38	29	43	328	285	327	940
Ex +:	51	65	25	26	34	59	36	56	32	58	92	54	60	50	44	33	49	341	290	341	962
Ex -:	45	58	20	23	28	52	30	46	27	51	78	44	54	46	33	26	36	319	274	318	923

R e m a r k s: *N.(T.) lophuromyia* differs from the following *liberia* and *nyongae* in its longer legs, its body and leg setae noticiably longer and bushy, and the shape and garment of its scutum which speak for themselves.

H o s t: *Lophuromys aquilus*. P a r a s i t o p e: in the ears.

L o c a l i t y & D a t e s: Kindu (Kivu Province, Zaire), 8 & 15 September, 1952.

2 - *Neotrombicula (Tauffliebicula) liberia* n.sp.

(Plate 2)

H o l o t y p e: L:161070/N1, deposited with some paratypes (5,6,8,9,10,12,13,15,17) in the Zool.Inst. & Zool.Museum Hamburg (Germany) and some paratypes (2,3,4,7,11,14,16, 18) in the Zool.Inst.Bulg.Acad. of Sciences. Total number of paratypes, 17.

D e s c r i p t i o n: *Tauffliebicula* of medium size, Ip = 838-842. SIF = 7B.S-B-3-3111.0ooo ; fPp = B/B/NNB.- Scutum: subrectangular with a prominent, rounded posteromargin; densely porous, pores smaller than in *lophuromyia;* bearing 2 slender trichobothria (78-82µm) with 5 long branches, and 5 peripheral barbed setae.- Eyes: (24µm), 2 anterior corneas (Ø 10µm).- Body setae: fD = 2H+6.6.6.6.4.2 = 32, fV = 4.6.6.8. 8.2u6.6.4.2 = 52, and NDV = 84 (as in *lophuromyia,* but less dorsals and more ventrals).- Chelicera: chelobase with pointed external flap; chelostyle as in *lophuromyia* (34µm long).- Galeala: with 8-10 branches (38µm long).- Palp: strongly sclerotized like the chelobase (78µm long); palpotarsus (13x7.5µm) with 7B, l S = 16µm, and S_o= 13µm.- Odontus: 23µm

©Zoologisches Museum Hamburg, www.zobodat.at

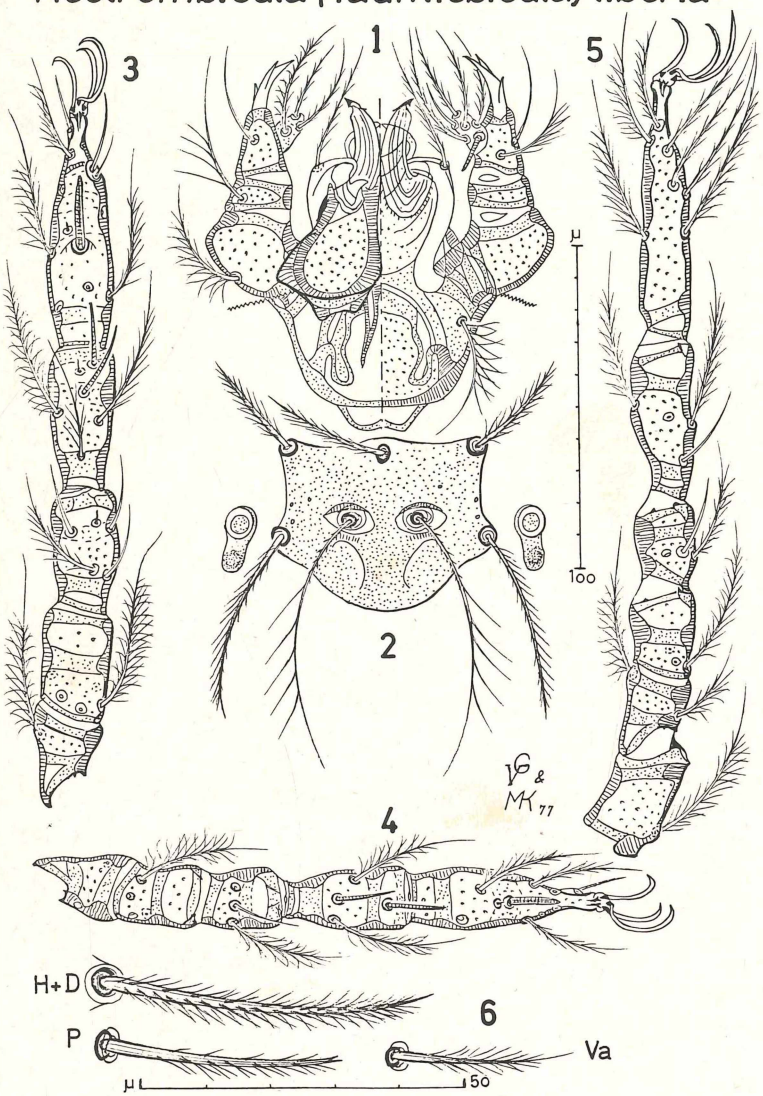


Plate 2. *Neotrombicula* (*Tauffliebicula*) *liberia* n.sp.
1 - Gnathosome. 2 - Scutum. 3 - Front leg (dorsum). 4 - Middle leg (dorsum). 5 - Hind leg (profile). 6- Body setae; H + D = humeral & dorsal, P = pygosomal, Va = anteroventral (magnified twice).

©Zoologisches Museum Hamburg, www.zobodat.at

long, with outer prong basal.-Anterior leg:S_1= 23µm, f_1= 1.5µm, ST = 26µm,pST = 14µm, PT'= 17µm, ta = 20 & 24µm, µt= 5µm, ga = 23/22/24µm, µg = 5 µm.-Middle leg: S_2= 17µm, f_2 = 1.5µm, PT"= 16µm,tm = 17& 20µm, gm = 22µm.-Posterior leg: tp = 24µm, gp = 24µm. leg shapes, terminations and pilosity as in *lophuromyia;* also the setae on coxae, trochanters and sternum. LST identical. Coxae: 66/60/59µm long.

M e a s u r e m e n t s: of the holotype (HT), and one paratype, compared with those of *nyongae* (nyo.) (all in micra).

	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	S	H	D	P	V	pa	pm	pp	Ip
HT:	59	64	20	25	28	53	28	40	35	57	82	48	52	49	32	28	37	298	245	299	842
PT:	58	64	19	25	28	53	27	44	36	60	78	51	57	51	37	30	42	296	248	294	838
nyo.:	43	52	18	22	25	47	29	41	27	51	70	44	51	40	40	25	40	298	260	310	868

R e m a r k s: The scutum of *liberia* is more rectangular, that of *nyongae* is squarer, and, except for the longer legs and solenidion S_1= 27µm of the latter, all its other measurements are sensibly lower than that of *liberia.*

H o s t: *Lophuromys sikapusi.* P a r a s i t o p e: ?

L o c a l i t y & D a t e: Njeble (near Bongtown, Liberia), 16 October 1970.

3 - *Neotrombicula (Tauffliebicula) nyongae* (TAUFFLIEB & MOUCHET,1959)

(Plate 3)

S y n o n y m y: *Trombicula nyongae* TAUFFLIEB & MOUCHET,1959, Audy, Lawrence & V-G.,1961. *Neotrombicula (Neotrombicula) nyongae,* TAUFFLIEB,1965,1966.

H o l o t y p e: and paratypes, deposited in the Museum National d'Histoire Naturelle, Paris (France).

D e s c r i p t i o n: *Tauffliebicula* of medium size, Ip = 868-894. SIF = 7B.S-B-3-3111.0ooo ; fPp = B/B/NNB.- Scutum: subsquare with a rounded posteromargin, densely porous, tiny pores; bearing 2 slender trichobothria (60-70µm long) with 3 long branches, and 5 peripheral barbed setae.- Eyes: (17µm), 2 anterior corneas (Ø 8µm).- Body setae: as in *liberia,* fD = 2H+6.6.6.6.4.2 = 32, fV = 8.8.8.4u6.6.6.4.2 = 52, and NDV = 84. - Chelicera: chelobase with rounded external flap; chelostyle (32µm long).- Galeala: (38µm), with 8-12 branches.- Palp: well sclerotized (70µm long); palpotarsus (9x7.5µm) with 7B, 1 S = 14µm, and S_o= 9µm.- Odontus: (23µm long), with outer prong basal.- Anterior leg: S_1=27µm, f_1= 1.5µm, ST = 25µm, pST = 13µm, PT'= 15µm, ta = 18 & 21µm, µt = 5µm, ga= 22/21/20µm, and µg = 6µm.- Middle leg: S_2= 18µm, f_2= 2µm, PT"= 14µm, tm = 15 & 18 µm, gm = 20µm.- Posterior leg: tp = 22µm, gp = 22µm. Legs shapes, terminations and pilosity as in *liberia.* Also the setae of coxae, trochanters and sternum. Coxae: 62/58/50µm long.

©Zoologisches Museum Hamburg, www.zobodat.at

Neotrombicula (Tauffliebicula) nyonge

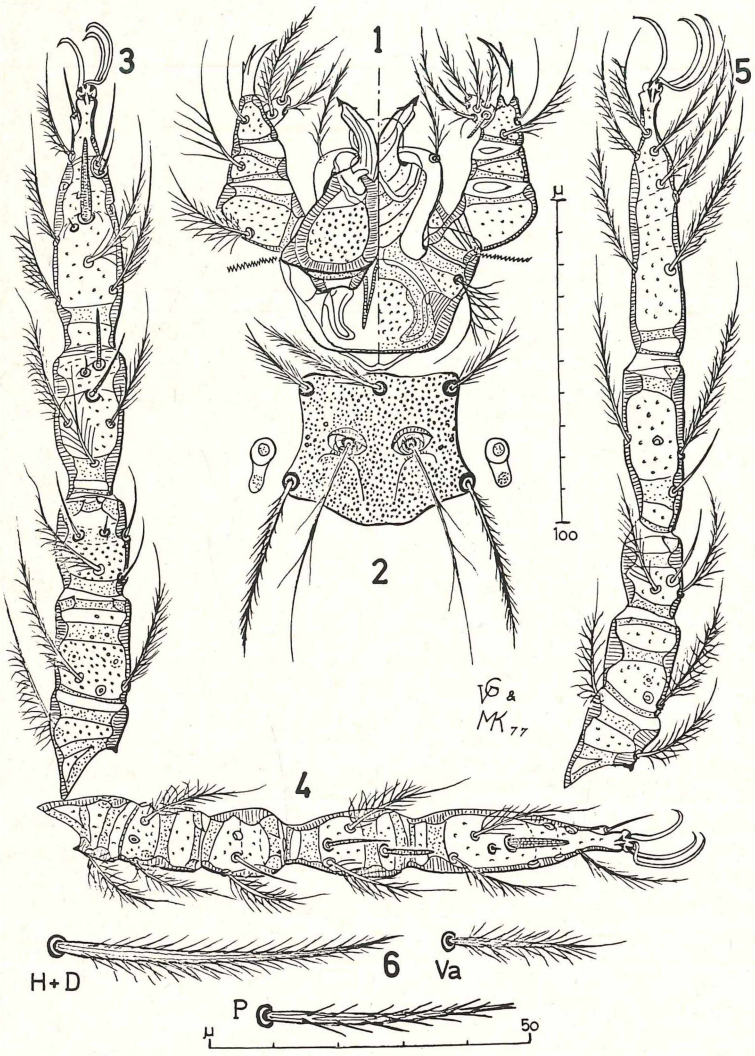


Plate 3. *Neotrombicula* (*Tauffliebicula*) *nyongae* (TAUFFLIEB et al., 1959) 1 - Gnathosome. 2 - Scutum. 3 - Front leg (dorsum). 4 - Middle leg (dorsum). 5 - Hind leg (profile). 6 - Body setae; H + D = humeral & dorsal, P = pygosomal, Va = anteroventral (magnified twice).

©Zoologisches Museum Hamburg, www.zobodat.at

M e a s u r e m e n t s: of the holotype (HT) after TAUFFLIEB & MOUCHET, and a paratype seen by us (PT)

	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	S	H	D	P	V	pa	pm	pp	Ip
HT:	45	55	19	22	25	47	29	42	27	52	60	43	57	--	36	21	36	302	277	315	894
PT:	43	52	18	22	25	47	29	41	27	51	70	44	51	45	40	25	40	298	260	310	868

R e m a r k s: The scutum of *nyongae* is more square and smaller than that of *liberia*.

H o s t s: Rodents (including *Lophuromys)*, insectivores *(Potamogale)* and bats.

L o c a l i t i e s & D a t e s: Yaoundé (Cameroun), Aug.to Dec.,1955 + Sept.,1957, and Dundo (Angola), Jan. to June, 1963.

Subfamily G a h r l i e p i i n a e WOMERSLEY,1952

This subfamily is basically separated from the Trombiculinae by the absence of an anteromedian scutal seta (AM), two always expanded trichobothria (sensillae), a leg segmentation, fsp = 7.6.6, no tibiala of mastitarsala on hind legs and two nude protorostralae (galeal setae) (only one exception recorded with branched galealae).

The Gahrliepiins are classically divided into three genera, depending upon the number of setae inserted in the dorsal scutum:

I - *Walchia* : 4 (2 AL + 2 PL),

II - *Schoengastiella* : 4 + 2 (2 AL + 2 PL + 2 PPL),

III - *Gahrliepia* : 4 + n (2 AL + 2 PL + n PPL; n = 4 to 32).

The repartition into subgenera is conditioned by other characters, such as: 1) the palpotarsal pilous formula, fT = 4B, 4B.S, 5B or 6B (B for branched setae and S for nude subterminala; the externo-basal solenidion being neglected as a constant); 2) the palpal pilous formula, fPp, variable from N/N/NNN to B/B/BNB, with a clear dominance of the former; 3) the scutum shape, with number, disposition and aspect of its setae; 4) Eyes, present or absent; 5) the two odonti palpotibial claws), with three, rarely two prongs; 6) the two chelostyles, more often simple, sometimes with a hook, or dorsally multidentate, or with an elongate and festooned tricuspid cap; 7) the pedogenualae (genual solenidia) formula, fG = 2-1-1, rarely 1-1-0, 2-0-0 or 1-0-0; 8) the pedocoxal setae formula, fCx = 1.1.1 to 1.1.M (M = 2-7); 9) the lenght ratio of front and hind legs, more often subequal, with the exception of *Scrobiculata* and *Lecythaspida* of which the posterior is mainly 10% longer than the anterior.

Although, in practice, more secondary features are taken in consideration, this above 'grosso modo' revision of main characters permits a fair identification.

Regarding the palpotarsal pilous formula, it is interest-

©Zoologisches Museum Hamburg, www.zobodat.at

ing to notice that: 1) the *Walchia* present a fT = 4B, except for the Oriental *Ripiaspichia*. 2) the *Schoengastiella* of the Ethiopian Reg. have a fT = 5B, whereas those of the other regions of the World show a fT = 4B or 4B.S; except for *Colocynthiella* (5B). 3) the *Gahrliepia* of the Ethiopian Reg. posses a fT = 5B (exceptionally 6B), whereas a fT = 4B or 4B.S is proper to all the other regions; except for the Oriental *Lecythaspidia* (6B).

I - Genus *Walchia* EWING,1931

This group gathers 5 subgenera, is almost worldwide (except Neotropical Reg.), and is represented in the Ethiopian Reg. by its subgenus *Fainiella*. From the Palearctic Siberian subregion a new subgenus, *Kepkaia*, is briefly diagnosed. The other subgenera are, *Walchia* EWING,1931, *Evansichia* V-G., 1968 and *Ripiaspichia* V-G., 1968, all three from the Oriental Reg.

Subgenus *Kepkaia* nov.

S y n o n y m y: K*, V-G., 1973.

S u b g e n e r o t y p e: *Walchia parvula* SCHLUGER,1955.

D i a g n o s i s: *Walchia* of medium size, Ip = 580 ; SIF = 4B-N-3-2000.oooo ; fPp = N/N/NNN. Scutum subpentagonal, rounded posteromargin. Eyes (2x1 corneas) . Pedogenualae (2-0-0). Pedocoxalae, fCx = 1.1.1. NDV = 88-94.

H o s t s: Mammals. S p e c i e s: 1 (N & Ad ?).

D i s t r i b u t i o n: Palearctic Siberian region.
(This taxon is devoted to our estimated colleague and friend, Dr. OTTO KEPKA)

II - Genus *Schoengastiella* HIRST,1915

This generic taxon gathers seven subgenera of which three are new, *Radfordiella, Elasmoproctiella* and *Dureniella,* and diagnosed briefly hereafter. The others are *Schoengastiella* HIRST, 1915, and *Colocynthiella* V-G., 1968, both from the Oriental Reg., then *Audya* V-G., 1956 and *Jadiniella* V-G., 1956, both from the Ethiopian Reg.

S y n o n y m y: *Gahrliepia,* WOMERSLEY & HEASLIP,1943. *Gahrliepia (Schoengastiella)* WOMERSLEY,1952.

G e n e r o t y p e: *Schoengastiella bengalensis* HIRST,1915.

D i a g n o s i s: Gahrliepiinae of small to medium size, Ip = 450-815; SIF = 4B, 4B.S or 5B-N-3-$\frac{211}{100}$0.oooo ; fPp = $\frac{N}{B}$/N/NNN(rare variations). Elongate subpentagonal scutum, seldom rounded; bearing 2 expanded trichobothria, and 4 + 2 peripheral setae. Eye corneas, 2x2, 2x1 or none. Galeala nude. Pedogenualae (2-1-1), except for *Colocynthiella* (1-0-0). Chelostyle with a hook in *Audya*. Body setae number, NDV=56-154.

©Zoologisches Museum Hamburg, www.zobodat.at

Pedocoxalae, fCx = 1.1.1(more often), but also 1.1.M (M = 2-8).

H o s t s: Mammals (mostly rodents), rarely birds and bats.

S p e c i e s: 36 (few nymphs known).

D i s t r i b u t i o n: Oriental and Ethiopian regions, rare from Palearctic Manchurian and Siberian regions.

A. Subgenus *Schoengastiella* HIRST,1915

D i a g n o s i s: *Schoengastiella* of medium size, Ip = 562-751 ; SIF = 4B-N-3-2110.oooo ; fPp = $\frac{N}{B}$/N/NNN (variations). Scutum rather elongate (horse-face-shaped), Eye corneas, 2x2, 2x1, or none. NDV = 56-100. Pedocoxalae, fCx = 1.1.1 or 1.1.M (M = 2-4).

H o s t s: Mammals; bird once. S p e c i e s: 7 (one nymph is known).

D i s t r i b u t i o n: Oriental and Palearctic Siberian regions.

B. Subgenus *Radfordiella* nov.

S y n o n y m y: *punctata* group, V-G., 1968.

S u b g e n e r o t y p e: *Schoengastiella hipposideros* AUDY,1952.

D i a g n o s i s: *Schoengastiella* of small to medium size, Ip = 425-641 ; SIF = 4B.S-N-3-2110.oooo ; fPp = N/N/NNN. Scutum elongate, sometimes widen and with a round postero-margin. Eyes, more often. NDV = 70-154. Pedocoxalae, fCx = 1.1.1 or 1.1.M (M = 2-5).

H o s t s: Mammals (rodents, rarely bats).

S p e c i e s: 8 (one nymph known).

D i s t r i b u t i o n: Oriental region.

(This taxon is dedicated to the memory of Dr. CHARLES D. RADFORD.)

C. Subgenus *Elasmoproctiella* nov.

S y n o n y m y: *birella* group, V-G., 1968.

S u b g e n e r o t y p e: *Gahrliepia (Schoengastiella) arona* TRAUB & EVANS,1954.

D i a g n o s i s: *Schoengastiella* of medium size, Ip = 596-653 ; SIF = 4B.S-N-3-2110.oooo ; fPp = N/N/NNN. Enlarged scutum with rounded posteromargin. Eye corneas, 2x2 or 2x1.

©Zoologisches Museum Hamburg, www.zobodat.at

Uropore opening in a large pygosomal plate. Pedocoxalae, fCx = 1.1.1. NDV = 64-66.

H o s t s: Rodents. S p e c i e s: 2 (N & Ad ?)

D i s t r i b u t i o n: Oriental region.

D. Subgenus *Dureniella* nov.

This group gathers fifteen species from the Ethiopian Reg., which, except for their fT = 5B, are morphologically close to the members of *Schoengastiella* s. str. (4B), with the *Radfordiella* (4B.S) in between; these two later from the Oriental Reg.

S y n o n y m y: *Schoengastiella,* ANDRÉ,1951. *Gahrliepia (Schoengastiella),* LAVOIPIERRE,1951.

S u b g e n e r o t y p e: *Schoengastiella dureni* JADIN & V-G.,1952.

D i a g n o s i s: *Schoengastiella* of small to medium size, Ip = 456-811. SIF = 5B-N-3-2110.oooo ; fPp = $\frac{B}{N}$/N/NNN (once, B/B/NNN), Elongated subpentagonal scutum, sometimes with rounded posteromargin. Eye corneas, 2x2, 2x1 or none. Pedocoxalae formula, fCx = 1.1.1 or 1.1.M (M = 2-5). NDV = 56-106.

H o s t s: Mammals; mainly rodents, insectivores and bats.

D i s t r i b u t i o n: Ethiopian region.

S p e c i e s: 15, including the 3 described hereafter (some nymphs are known).

4 - *Schoengastiella (Dureniella) ocellata* n.sp.

(Plate 4)

H o l o t y p e: L:161070/0/1, deposited in the Zool.Inst. & Zool.Museum Hamburg (Germany); one single paratype in the Zool.Inst.Bulgarian Acad. of Sciences.

D e s c r i p t i o n: *Dureniella* of medium size, Ip = 581. SIF = 5B-N-3-2110.oooo ; fPp = N/N/NNN.- Scutum: long oval, large pores regularly disposed following small polygonal patterns; bearing 2 claviform trichobothria, and 4 + 2 peripheral barbed and thin setae, the post-posterolaterals being the longest (PL´>AL>PL).- Eyes: absent.- Body setae: fD = 2H+4.6.6.6.4.2.2 = 32, fV = 8.6.6$\underline{u}$4.4.4.2 = 34, NDV = 66.- Chelicera: strong chelobase well porous, chelostyle with one little dorso-subapical dent and an elongate tricuspid cap (30 µm long).- Galeala: nude (27 µm).-Palp: (49 µm long), palpotarsus with 5 B and S_o= 8 µm.- Odontus: trifurcate (15 µm long).- Anterior leg: S_1= 15 µm, f_1= 1 µm, ST = 21 µm, pST = 8 µm, PT'= 12 µm, ta = 11 & 14, µt = 4 µm, ga = 18 & 17 µm, µg = 3 µm.- Middle leg: S_2 = 13 µm, f_2 = 1 µm, PT" =

©Zoologisches Museum Hamburg; www.zobodat.at

Schoengastiella (Dureniella) ocellata

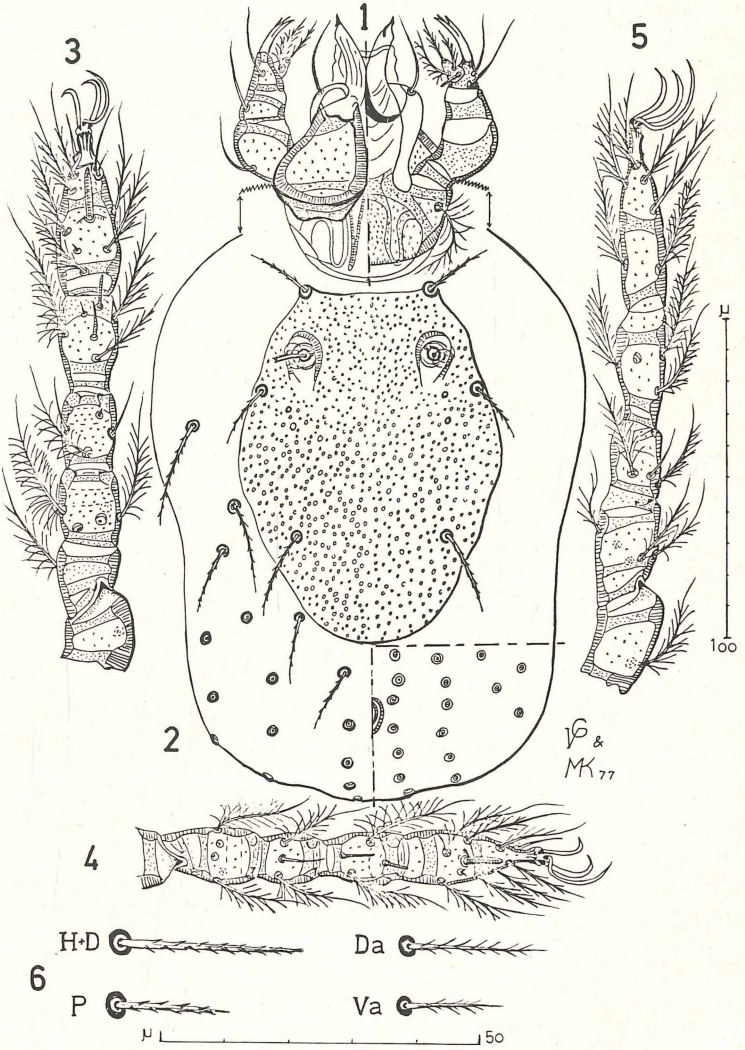


Plate 4. *Schoengastiella* (*Dureniella*) *ocellata* n.sp.
1 - Gnathosome. 2 - Body, with ventral pygosome portion on right. 3 - Front leg (dorsum). 4 - Middle leg (dorsum). 5 - Hind leg (profile). 6 - Body setae; H + D = humeral & dorsal, Da = anterodorsal (center), P = pygosomal, Va = anteroventral (magnified twice).

©Zoologisches Museum Hamburg, www.zobodat.at

11µm, tm = 9 & 12µm, gm = 15µm.- Posterior leg: gp = 17µm. Strong legs, segmentation fsp = 7.6.6., provided with a constant number of branched setae (see LST), and terminated by 2 subequal claws and 1 thinner empodium with a lanceolate apex. Pedocoxalae, fCx = 1.1.2 (branched). Pedotrochanteralae, fTr = 1.1.1. Sternalae, fSt = 2.2. Coxae: 50/52/46µm long.

M e a s u r e m e n t s: of the holotype (all in micra).

	AW	PW	PW'SB	ASB	PSB	SD	AP	AP'AL	PL	PL'	S	H	D	P	V
HT:	39	68	47	41	20	92	112	34	76	22	19	24	-	33	28 20	15	17 20

	pa	pm	pp	Ip
HT:	203	175	203	581

LST:	pa	pm	pp
T	22	16	15
t	8	6	6
G	4	3	3
F	6	6	5

R e m a r k s: The scutum of *ocellata* is an almost perfect oval (112x82 µm). Most of the other *Dureniella* posses a subpentagonal scutum, more or less elongate. Also its scutal and dorsal setae are particularly thin, and bears very short barbs.

H o s t s: Rodents, *Lophuromys sikapusi* TEMMINCK.

P a r a s i t o p e: ?

L o c a l i t y & D a t e: Njeble (near Bongtown, Liberia), 16 October 1970.

5 - *Schoengastiella (Dureniella) subcaeca* n.sp.

(Plate 5)

H o l o t y p e: L: 161070/S/1, deposited with some paratypes (3,4) in the Zool.Inst. & Museum Hamburg (Germany) and some paratypes (2,5) in the Zool.Inst.Bulgarien Acad. of Sciences. Total number of paratypes, 4.

D e s c r i p t i o n: *Dureniella* of medium size, Ip = 564. SIF = 5B-N-3-2110.oooo ; fPp = N/N/NNN.- Scutum long, subpentagonal; densely porous, thin pores mixed in the posterior middle with few large round carvings (scrobicules); bearing 2 claviform trichobothria, and 4 + 2 peripheral barbed setae (PL> AL> PL').- Eyes: absent.- Body setae: fD = 2H+4.6.6.6.4.4.2 = 34, fV = 10.6.4.6u4.6.4.2 = 42, NDV = 76.- Chelicera: strong chelobase, well porous; chelostyle with a short dorso-subapical dent, and a somewhat elongate tricuspid cap (28 µm long).- Galeala: nude (25 µm).- Palp: (45 µm long), palpotarsus with 5B and S_o = 7 µm.- Odontus: trifurcate (15 µm long).- Anterior leg: S_1= 15 µm, f_1= 1.5 µm, ST = 20 µm, pST = 6 µm, PT'= 11 µm, ta = 10 & 12 µm, µt = 4 µm, ga = 17 & 16 µm, µg = 3 µm.- Middle leg: S_2 = 13 µm, f_2= 2 µm, PT"= 10 µm, tm = 8 & 10 µm, gm = 15 µm.-

©Zoologisches Museum Hamburg, www.zobodat.at

Schoengastiella (Dureniella) subcaeca

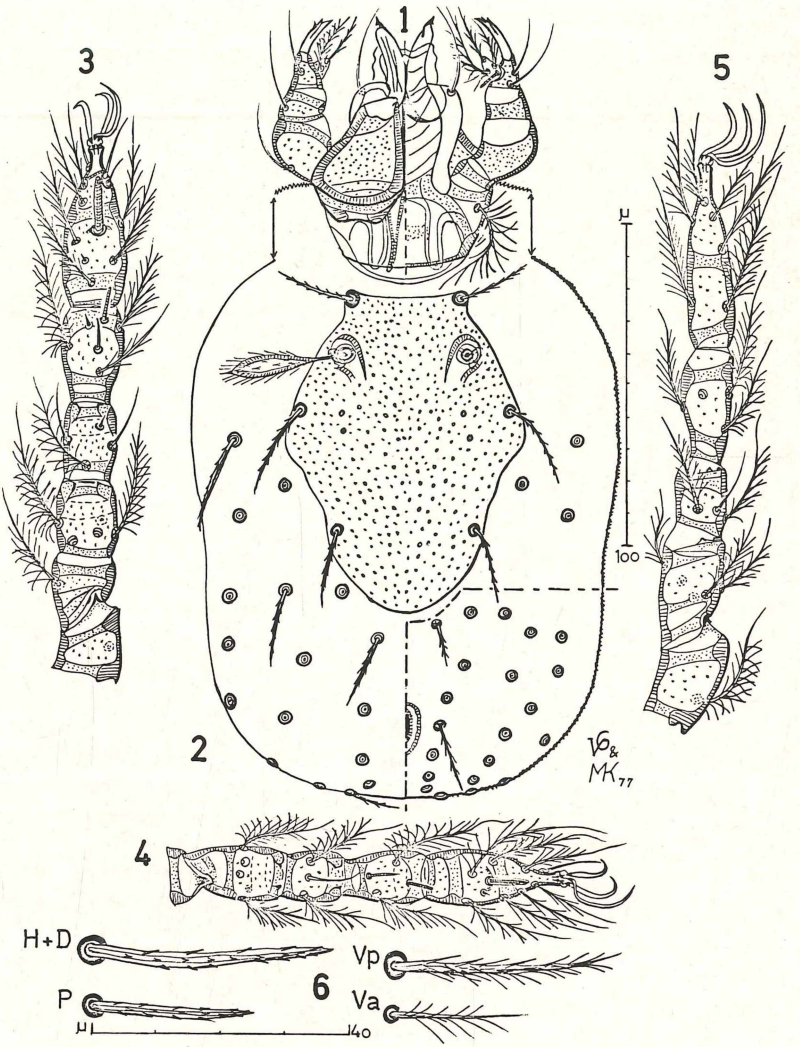


Plate 5. *Schoengastiella* (*Dureniella*) *subcaeca* n.sp.
1 - Gnathosome. 2 - Body, with ventral pygosome portion on right. 3 - Front leg (dorsum). 4 - Middle leg (dorsum). 5 - Hind leg (profile). 6 - Body setae; H + D = humeral & dorsal, P = pygosomal, Va = anteroventral, Vp = posteroventral (magnified twice).

©Zoologisches Museum Hamburg, www.zobodat.at

Posterior leg: gp = 16µm. Legs shapes, terminations and pilosity as for *ocellata*, LST identical. Pedocoxalae, fCx = 1.1.2. Coxal lengths: 50/48/44µm.

M e a s u r e m e n t s: of the holotype (all in micra).

	AW	PW	PW'	SB	ASB	PSB	SD	AP	AP'	AL	PL	PL'	S	H	D		P	V	
HT:	34	66	42	38	20	79	99	38	72	26	29	24	38	31	25	22	17	15	24

	pa	pm	pp	Ip
HT:	194	168	202	564

R e m a r k s: From a general morphologycal standpoint *subcaeca* and *caeca* are rather similar. Practical differential diagnoses is as follow:

	Scutum			Body Setae	
	AW	Porosity	Scrobicules	NDV	Dorsals
caeca:	41	Large, spaced	None	62	Normal + short barbs
subcaeca:	34	Thin, dense	Few posterocentral	76	Thin + very short barbs

H o s t: Rodent, *Lophuromys sikapusi* TEMMINCK.

P a r a s i t o p e: ?

L o c a l i t y & D a t e: Njeble (near Bongtown, Liberia), 16 October 1970.

6 - *Schoengastiella (Dureniella) caeca* ANDRÉ, 1951

(Plate 6)

S y n o n y m y: *Schoengastiella caeca*, LE GAC, 1952. *Gahrliepia (Schoengastiella) caeca*, AUDY, LAWRENCE & V-G., 1961. *Gahrliepia (Schoengastiella) coeca*, TAUFFLIEB, 1964 (sic!)

H o l o t y p e: and several paratypes in the Museum National d'Histoire Naturelle, Paris (Fr.)

D e s c r i p t i o n: *Dureniella* of medium size, Ip = 584-601. SIF = 5B-N-3-2110.oooo ; fPp = N/N/NNN. Scutum subpentagonal, long; regularly porous, large pores, spaced, not scrobiculate; bearing 2 claviform trichobothria, and 4 + 2 peripheral setae (PL > AL > PL').- Eyes: absent.- Body setae: fD = 2H+4.6.6.6.4.2 = 30, fV = 10.8.2µ4.4.4.2 = 32, NDV = 62.- Chelicera: strong, well porous chelobase; chelostyle with a short dorso-subapical dent, and an elongate tricuspid cap (29µm long).- Galeala: nude (26µm).- Palp: (46µm long), palpotarsus with 5B and S_o = 6µm.- Odontus: trifurcate (13µm long).- Anterior leg: S_1 = 16µm, f_1 = 2µm, ST = 21µm, pST = 7µm, PT' = 14µm, ta = 10 & 14µm, µt = 4µm, ga = 17 & 16µm, µg = 3µm.- Middle leg: S_2 = 13µm, f_2 = 2µm, PT" = 13µm, tm = 8 & 11µm, gm = 16µm.- Posterior leg: gp = 17µm. Legs shapes, terminations, pilosity and LST as in *subcaeca*. Pedocoxalae, fCx = 1.1.2. Coxal lengths: 52/53/48µm.

©Zoologisches Museum Hamburg, www.zobodat.at

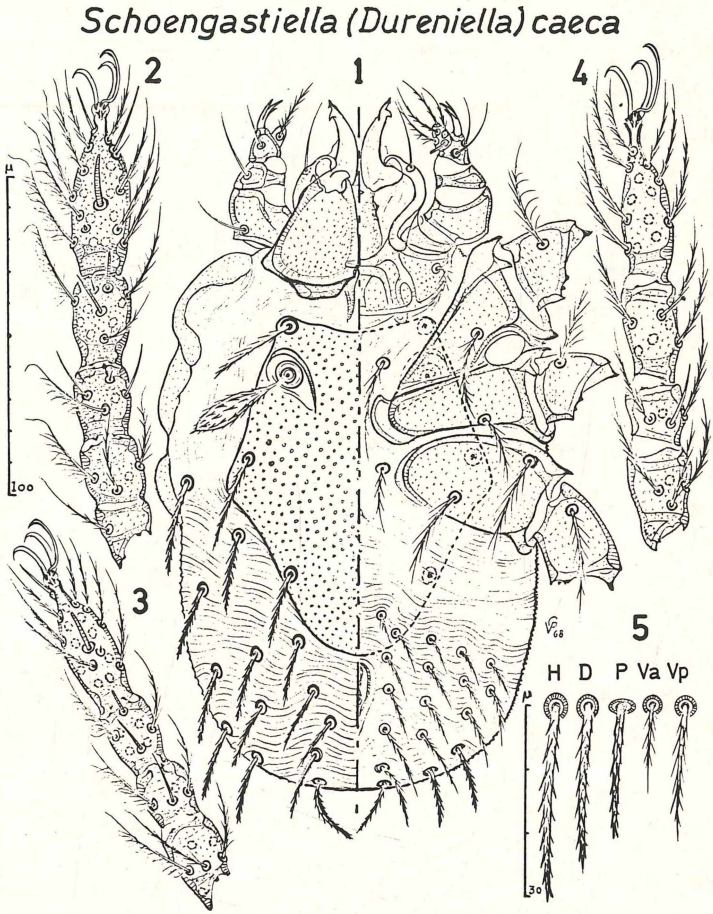


Plate 6. *Schoengastiella* (*Dureniella*) *caeca* (ANDRÉ, 1951)
1 - Body, dorsal half left, ventral half right; plus gnathosome, and leg coxae with trochanters. 2 - Front legs (dorsum). 3 - Middle leg (dorsum). 4 - Hind leg (profile). 5 - Body setae; H = humeral, D = dorsal, P = pygosomal, Va = anteroventral, Vp = posteroventral (magnified twice).

©Zoologisches Museum Hamburg, www.zobodat.at

M e a s u r e m e n t s: means of 12 paratypes (all in micra).

	AW	PW	PW'	SB	ASB	PSB	SD	AP	AP'	AL	PL	PL'	S	H	D	P	V
M/12:	43	71	44	43	19	87	106	42	76	28	31	24	35	30	26	23	21	14	21

	pa	pm	pp	Ip
M/12:	201	178	210	589

R e m a r k s: As emphasized by TAUFFLIEB (1964,1965) *caeca* is very common from east to west of the Ethiopian region. However there may be some very close species, subspecies and local forms or variations.

H o s t s: Rodents (including *Lophuromys* sp.), insectivores and squirrels.

P a r a s i t o p e: more often ears.

L o c a l i t i e s & D a t e s: Type material, Fort Sibut (Oubangui-Chari, Républ.Centrafricaine), 2 December 1950. Also from Bangui, 1951, 1952, and Brazzaville (Rep.C. Afr.), and Libengué, 1952 (Zaire).

III - Genus *Gahrliepia* OUDEMANS,1912

This generic taxon is founded on OUDEMANS' description of his *Typhlothrombium nasus* of 1910, so accurately illustrated in his large opus of 1912. In the same year 1912, he created a new generic taxon, *Gahrliepia,* in replacement of *Typhlothrombium,* a name preoccupied by *Typhlothrombium* BERLESE,1910, with a short anteriority.

Twenty six years after, EWING erected the genus *Gateria* to shelter three Malaysian larval chiggers described by B.A.R. GATER in 1932, selecting *Gahrliepia fletcheri* as type species. His decision leaned on the fact that the *Gahrliepia* showed a scutal pilous number of 4 pairs -- 2 anterolaterals (2 AL) + 2 posterolaterals (2 PL) + 2x2 post-posterolaterals (2x2 PPL) all marginal-, whereas the *Gateria* posses more than 4 pairs of which some are not peripheral -- 2 AL + 2 PL + n PPL (n = 6 or more).

However, thirty years of discoveries disclosed that such system was leading to inextricable complications. V-G. (1968) proposed to simplify the separation on the base of the palpotarsal pilous formula, fT = 5B for *Gahrliepia* recorded only from the Ethiopian region, and fT = 4B for *Gateria* found only in the Oriental reg., and the Palearctic Siberian and Manchurian subregions.

Nevertheless, and to prove that nothing is ever granted by Mother Nature, the first *Gateria* (4B) ever collected from the Ethiopian reg. is described later in this work, *Gahrliepia (Gateria) megaspis* n.sp.

Presently, this genus *Gahrliepia* is divided into 6 subgenera of which the dwelers of the Ethiopian region are defined below. These 6 subgenera are: 1) *Gahrliepia* OUDEMANS, 1912, 2) *Gateria* EWING,1938, 3) *Scrobiculata* V-G.,1968,

©Zoologisches Museum Hamburg, www.zobodat.at

4) *Lecythaspida* V-G.,1968, 5) *Giroudia* JADIN & V-G.,1952, 6) *Ozosetiella* n.sg..

S y n o n y m y: *Typhlothrombium* OUDEMANNS,1910 (non *Typhlothrombium* BERLESE,1910). *Gateria* EWING,1938.

G e n e r o t y p e: *Typhlothrombium nanus* OUDEMANS,1910 (= *Gahrliepia nana,* OUDEMANS,1912).

D i a g n o s i s: Gahrliepiinae of medium to large size, Ip = 520-1070. SIF = 4B, 4B.S, 5B or 6B-N-$\frac{3}{2}$-2110.oooo ; fPp variable from N/N/NNN to B/B/BNB, especially in the *Scrobiculata*.- Scutum: largely expanded with versatile sclerous patterns (carvings, scrobicules); bearing 2 expanded trichobothria (sensillae), and 4 + n setae (n = 4-32). Protorostalae (galeal setae) always nude.- Eyes: more often present, with 2x2 or 2x1 corneas (no eyes in 18 cases). NDV = 50-120. Hind leg coxa often multisetose, fCx = 1.1.1 or 1.1.M (M = 2-7). Pedogenualae formula, fPg = 2-1-1.- Odonti (palpotibial claws): with 3 prongs, except in *G. nasus* (2).- Chelostyles: more often simple, sometimes with a subapical hook or dents on the dorsal edge, sometimes with a tricuspid cap elongating and festooning on the ventral edge, like in *Giroudia*.- Legs: anterior and posterior more often subequal in length, but in *Scrobiculata* and *Lecythaspida* the hind leg is more than 10% longer than the front one (pp > pa + $\frac{pa}{10}$).

H o s t s: Mammals, more often rodents, insectivores & bats, rarely birds.

S p e c i e s: more than 60; some nymphs are known.

D i s t r i b u t i o n: Oriental reg., Ethiopian reg., and Palearctic Siberian and Manchurian subregions.

A. Subgenus *Gahrliepia* OUDEMANS,1912

D i a g n o s i s: *Gahrliepia* of medium size, Ip = 546-652. SIF = 5B-N-$\frac{3}{2}$-2110.oooo ; fPp = N/N/NNN.- Scutum: largely expanded, rarely scrobiculate. Eye corneas absent.- Odontus: 3 pronged, except in *G. nanus* (bifid).- Chelostyle: simple with tricuspid cap. NDV = 58-86. fCx = 1.1.1 or 1.1.M (M = 2-4). Front and hind legs subequal Pedotrochanter usually unisetose (bisetose in *G. lawrencei*).

H o s t s: Mammals. S p e c i e s: 10 (larval).

D i s t r i b u t i o n: Ethiopian region.

©Zoologisches Museum Hamburg, www.zobodat.at

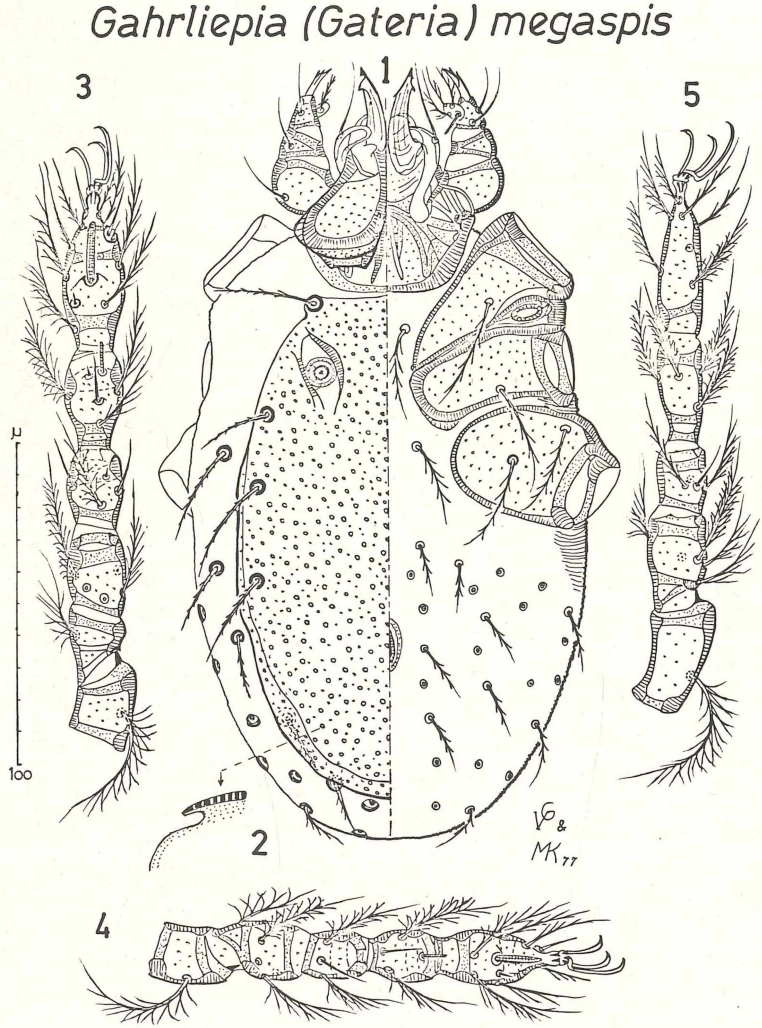


Plate 7. *Gahrliepia* (*Gateria*) *megaspis* n.sp.
1 - Body, dorsal half left, ventral half right; plus gnathosome, and leg coxae. 2 - cut through the posterior scutal ridge.
3 - Front leg (dorsum). 4 - Middle leg (dorsum). 5 - Hind leg (profile).

©Zoologisches Museum Hamburg, www.zobodat.at

B. Subgenus *Gateria* EWING,1938

S y n o n y m y: *Gahrliepia,* GATER,1932. *Gahrliepia (Gateria)* WOMERSLEY,1952.

S u b g e n e r o t y p e: *Gahrliepia fletcheri* GATER,1932 (= *Gateria fletcheri,* EWING,1938).

D i a g n o s i s: *Gahrliepia* of medium size, Ip = 545-856. SIF = 4B-N-3-2110.oooo ; fPp variable from N/N/NNN to B/BNB. - Scutum: like in *Gahrliepia.*— Eyes: corneas 2x2, 2x1 or absent (6 cases).- Odontus: trifid.- Chelostyle: simple with tricuspid cap. NDV = 64-120. fCx = 1.1.1 (once each 1.1.2 and 1.1.4). Front and hind legs subequal.

H o s t s: Mammals, rarely birds.

S p e c i e s: 25; one nymph is known.

D i s t r i b u t i o n: Oriental reg. and Palearctic Manchurian subregion (3 species).

7 - *Gahrliepia (Gateria) megaspis* n.sp.

(Plate 7)

H o l o t y p e: L: 161070/M/1, deposited in the Zool.Inst. & Museum Hamburg (Germany) one single paratype in the Zool.Inst. Bulgarian Acad. of Sciences.

D e s c r i p t i o n: *Gateria* of medium size, Ip = 623. SIF = 4B-N-3-2110.oooo ; fPp = N/N/NNN.- Scutum: long and suboval; regularly porous, small pores with intertitial scrobiculs in the center of scutum (like in *fletcheri);* bearing two claviform trichobothria (broken off), and 4 + 4 peripheral barbed setae (PL'> AL > PL"> PL).-Eyes: absent.- Body setae: fD = 2H+4.4.4.6.4.2 = 26, fV = 8.8.4u8.6.6.4.2 = 46, NDV = 72; all thin setae (like the scutals), with very short and rare barbs. On the unfed specimens the cuticule is folded under the scutal margin, hiding the dorso-central seta bases of rows 4 and 5.- Chelicera: strong; well porous chelobase with an external rounded flap; chelostyle (33µm), with a dorso-subapical hook, and an elongate tricuspid cap.- Galeala: nude (22µm).- Palp: (49µm long), palpotarsus with 4B and S_o= 9µm.- Odontus: trifurcate (16µm long).- Anterior leg: S_1= 19µm, f_1= 1.5µm, ST = 22µm, pST = 8µm, PT'= 14µm, ta = 11 & 14µm, µt = 4µm, ga = 18 & 17µm, µg = 3µm.- Middle leg: S_2= 14µm, f_2= 4µm, PT"= 13µm, tm = 8 & 12µm, gm = 15µm.- Posterior leg: gp = 16µm. Claws and empodia of medium strength. Ordinary leg setae well branched. LST as in the preceding *Schoengastiella.* Trochanteralae profusely branched, fTr = 1.1.1. Coxalae, fCx = 1.1.2 (branched). Coxal lengths: 57/50/48µm.

©Zoologisches Museum Hamburg, www.zobodat.at

M e a s u r e m e n t s: of the holotype (all in micra).

	AW	PW	PW'	PW"	SB	ASB	PSB	SD	AP	AL	PL	PL'PL"	S	H	D	P	V
HT:	46	76	83	84	43	22	134	156	37	30	21	32	29	-	31	22	19	15	16	18

	pa	pm	pp	Ip
HT:	225	188	210	623

R e m a r k s: *Gateria* are mainly Far Eastern species (Oriental region). This is the first finding in the Ethiopian region.

H o s t s: Rodent, *Lophuromys sikapusi* TEMMINCK.

P a r a s i t o p e: follicle, near the eyes (intradermoparasitism).

L o c a l i t y & D a t e: Njeble (near Bongtown, Liberia), 16 October 1970.

C. Subgenus *Giroudia* JADIN & V-G.,1952

The first members of this group were found on field rats captured near Astrida (Rwanda). They were considered as pertaining to a new genus for the two following reasons: 1) multidentate chelicerae (dorsal edge), 2) scutum with 4 pairs of setae of which the 2 post-postlateral pairs are subcentral, not marginal like in the *Gahrliepia,* or scattered at random like in *Gateria*. The cheliceral multidentation was clearly observable on several specimens of the type species, *Giroudia longiscutullata*. However, this was not the case regarding the only three and rather poor specimens of the second species, *G. brennani*. Later, V-G.(1956) reported that the cheliceral dents resulted in a misinterpretation due to superposed chelostyles. That, in fact, they are the dents of a festooned prolongation of the tricuspid cap, on the ventral edge of the chelostyle.

Meanwhile, thanks to more discoveries, it became obvious that any *Giroudia* shows always one of the following combinations of two features:

a) a markedly festooned prolongation of the tricuspid cap on the ventral edge, and no dents on the dorsal edge. Ex.: *brennani* (original types from Astrida), *bellieri* TAUFFLIEB,1965 (from Ivory Coast), *mireillae* TAUFFLIEB,1965 (from Angola).

b) a markedly festooned prolongation of the tricuspid cap on the ventral edge, and 2-4 dents on the dorsal edge. Ex.: *brennani* (from North Kivu), and an unpublished species (from Lagos).

c) a prolongation — but unconspicuously festooned — of the tricuspid cap, plus 3-7 dents on the dorsal edge. Ex.: *longiscutullata* (types from Astrida and more specimens from North Kivu and Bukavu).

©Zoologisches Museum Hamburg, www.zobodat.at

Considering the aspect of the scutum, it is generally moderately elongate, with a sometimes plumpish rear and a rounded posterior margin; except for *G. longiscutullata* in which it is noticiably more elongate. The two pairs of median post-postlateral setae (2 PM + 2 PM') are inserted subcentrally in the scutal rear, delimiting an almost rectangular area. However, *G. mireillae* TAUFFLIEB,1965, overlooks that rule in presenting a peculiar diploid scutal pilosity -- reflecting even on the peri-scutal setae --, showing the main pattern: 4 PM + 4PM'+ 4 PM", and varying practically in number from 16 to 19 (instead of 8).

A secondary differential character is the pedotrochanteral pilosity formula, which is generally fTr = 1.1.1, but shows 1.1.2 for *G. bellieri* TAUFFLIEB,1965, and for the undescribed species of Lagos (provisional symbol 'GGj').

To display a faithful image of this subgenus, the hereafter description of *G. (Giroudia) liberiensis* n.sp. will be accompanied by the measurements and a key of the existing species, including the new undescribed Nigerian species (GGj).

S y n o n y m y: *Giroudia* JADIN & V-G., 1952. *Gahrliepia (Giroudia)* AUDY, LAWRENCE & V-G.,1961. *Gahrliepia (Gahrliepia)*, TAUFFLIEB,1965.

S u b g e n e r o t y p e: *Giroudia longiscutullata* JADIN & V-G.,1952; = *Gahrliepia (Giroudia) longiscutullata*, AUDY, LAWRENCE & V-G.,1961.

D i a g n o s i s: *Gahrliepia* of medium size, Ip = 527-608. SIF = 5B-N-3-2110.oooo ; fPp = B/N/NNN or B/B/NNN.- Scutum: not too elongate often suboval (more elongate in *longiscutullata)*, regularly and densely punctate (thin pores); bearing 8 setae, 2 AL + 2 PL + 2 PM + 2 PM', the PMs or median post-posterolaterals, delimiting a rectangular area on the scutal rear.- Eyes: 2x2, the posterior being intracutaneous and deprived of corneas.- Chelostyles: as described in detail in the above preamble.- Odontus: trifid. NDV = 66-98.- Pedocoxalae: fCx = 1.1.1 or 1.1.M (M = 2-5).- Pedotrochanteralae: fTr = 1.1.1 or 1.1.2 (cfr. the key).

H o s t s: Mammals; rodents & insectivores.

D i s t r i b u t i o n: Ethiopian region.

8 - *Gahrliepa (Giroudia) liberiensis* n.sp.

(Plate 8)

H o l o t y p e: L: 61070/M/1, deposited with some paratypes (3,4,5,6,7,12,13,14,15) in the Zool.Inst. & Museum, Hamburg (Germany) and some paratypes (2,8,9,10,11,16) in the Zool.Inst.Bulgarian Acad. of Sciences. Total number of paratypes, 16.

D e s c r i p t i o n: *Giroudia* of medium size, Ip = 543-570. SIF = 5B-N-3-2110.oooo; fPp = B/B/NNN.- Scutum: roughly suboval, with strangled anterior portion; densely porous,

©Zoologisches Museum Hamburg, www.zobodat.at

Gahrliepia (Giroudia) liberiensis

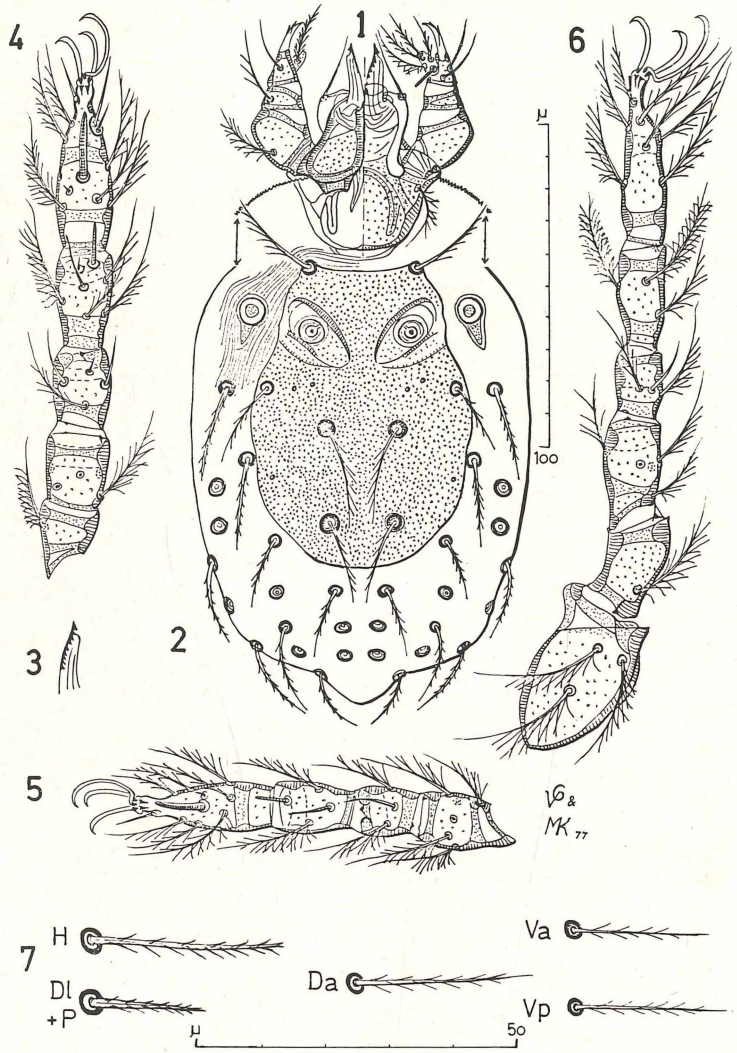


Plate 8. *Gahrliepia* (*Giroudia*) *liberiensis* n.sp.
1 - Gnathosome. 2 - Body (dorsum). 3 - chelostyle tip. 4 - Front leg (dorsum). 5 - Middle leg (dorsum). 6 - Hind leg (profile), with coxa and trochanter. 7 - Body setae; H = humeral, Da = anterodorsal, Dl + P = laterodorsal & pygosomal, Va = anteroventral, Vp = posteroventral (magnified twice).

©Zoologisches Museum Hamburg, www.zobodat.at

thin pores; bearing 2 trichobothria (broken off in all specimens), and 4 + 4 barbed setae, the 2 posterior pairs being central (a chief character of the *Giroudia).*- Eyes: a pair of anterior corneas (Ø 8µm), plus intracutaneous posterior structure.- Body setae: fD = 2H+4.6.6.6.4.2 = 30, fV = 10.8.6.u 6.6.4.4.4.2 = 50, NDV = 80; centrodorsals (scutum and body), sensibly much thinner and acuminate than the laterals.- Chelicera: chelobase with an external flap; chelostyle (26µm), with a dorso-subapical arris, and an elongate festooned tricuspid cap (5-7 dents).- Galeala: nude (20µm long). Palp: (49µm long), conical palpotarsus with 5B and S_o= 9µm.- Odontus: trifurcate (13µm).- Anterior leg: S_1= 19µm, f_1= 2µm, ST = 19µm, pST = 7µm, PT'= 11µm, ta = 13 & 16µm, µt = 3µm, ga = 18 & 18µm, µg = 4µm.- Middle leg: S_2= 12µm, f_2= 2µm, PT"= 10µm, tm = 9 & 12µm, gm = 15µm.- Posterior leg: gp = 16µm. Pedocoxalae, fCx = 1.1.3 (rarely and unilaterally, 2 or 4), all branched. Pedotrochanteralae, fTr = 1.1.1 (all branched). Coxae, 52/50/44µm long. Legs with classical LST shown in *ocellata,* ordinary setae well branched, feathered on ventral side.

M e a s u r e m e n t s: in micra; of *liberiensis* HT + means of 5 PT (M/5); plus *traubi* AUDY et al, 1961 (tr.); *bellieri* (bel.) and *mireillae* (mir.) TAUFFLIEB,1965; GGj (unpublished), and *longiscutullata* (long.) JADIN & V-G.,1952, the subgenerotype of the group.

	AW	PW	PW'	PW"	SB	ASB	PSB	SD	AP	AL	PL	PM	PM'
HT:	33	60	21	19	30	21	74	95	41	29	27	31	28
M/5:	33	59	22	20	31	20	74	94	40	29	27	31	28
tr.:	34	61	26	20	32	20	75	95	40	27	24	30	26
bel.:	36	58	20	19	32	21	80	101	46	25	26	26	24
mir.:	41	67	18	14	35	22	89	111	39	38	41	35	28
GGj :	34	58	22	19	28	21	75	96	38	31	27	33	31
long.:	47	76	32	28	45	20	134	154	34	28	34	36	38

	S	H	D		P	V		pa	pm	pp	Ip
HT:	--	29	29	22	18	15	22	198	169	189	546
M/5:	--	29	28	22	20	16	21	196	167	194	557
tr.:	36	27	26	21	20	15	21	188	158	188	534
bel.:	30	26	27	16	16	16	27	182	157	188	527
mir.:	33	38	39	27	27	19	27	210	184	214	608
GGj :	32	29	27	24	25	17	25	188	155	187	530
long.:	34	32	31	27	26	20	23	200	170	198	568

R e m a r k s: *liberiensis* is obviously close to *traubi,* which has a fCx = 1.1.2 (instead of 1.1.3), and a fPp = B/N/NNN (instead of B/B/NNN); *bellieri* differs from both of them in its fD = 2H+6.4.4.4.2 = 22, and its trochanteralae 1.1.2, but could be very close, if not identical, to GGj. As for *mireillae* it presents a peculiar diploid pilosity of the scutum involding the 'median post-postlaterals':4 PM , 4 PM' and 4 PM" (the scutal setae may vary from 16 to 19 in number, instead of 8), fCx = 1.1.3 to 4 (sometimes 5), fTr = 1.1.1. The subgenerotype, *longiscutullata* differs from the preceding species in its very long scutum and a NDV = 100.

©Zoologisches Museum Hamburg, www.zobodat.at

Key to the species of the subgenus *Giroudia*

1 - a: 8 scutal setae 2
    b: 16 or more ..... *mireillae*

2 - a: Scutum length, SD< 120, NDV = 56-72 3
    b: SD >140, NDV = 96-102 ..... *longiscutullata*

3 - a: Pedotrochanters setae formula, fTr = 1.1.2 4
    b: fTr = 1.1.1 5

4 - a: Chelostyle with 3-4 dorsal hooks or teeth ..... GGj
    b: Only one dorso-subapical arris or dent ..... *bellieri*

5 - a: fPp = B/B/NNN, fCx = 1.1.3,and NDV = 80-82 ..... *liberiensis*
    b: fPp = B/N/NNN, fCx = 1.1.2, and NDV = 56-72 .... *traubi*

D. Subgenus *Ozosetiella* nov.

S u b g e n e r o t y p e: *Gahrliepia moucheti* V-G.,1960.

D i a g n o s i s: *Gahrliepia* of medium size, Ip = 680-692; SIF = 6B-N-3-2110.oooo ; fPp = B/B/NNB. Enlarged scutum, regularly porous, with 4 + n barbed setae (n = 14), all laid-out more or less peripherally. Eyes with 2 anterior corneas and posterior intracutaneous structures. NDV = 64-68. Anterior and posterior legs subequal. Pedocoxalae, fCx = 1.1.M (M = 4). Trochantera without scales and unisetose.

H o s t s: Mammals. S p e c i e s: 1 (N & Ad ?).

D i s t r i b u t i o n: Ethiopian region.

Addendum

The revision of the *Neotrombicula* generic complex is part of a project initiated in 1964 by one of us (V-G.), under the name of "The Chigger Mites of the World". It involved, till the present work, three genera, *Neotrombicula, Blankaartia* and *Crotiscus*. We explained on page 103 of this work, why a new genus, *Afrotrombicula,* was created.

On plate 9 are shown three basical scuta of *Neotrombicula* (A,C & D), compared with that of *Afrotrombicula* (B). That evidence speaks for itself regarding only one morphological difference.

A - *Neotrombicula (Neotrombicula) autumnalis* SHAW,1790, RICHARDS, 1950, (Neotype): the pattern of which matches that of about 70 species, all of them showing 2 simple glabrous protorostralae or galeal setae, and pertaining to four different subgenera.

C - *Neotrombicula japonica* (TANAKA,1916): is the type species of

©Zoologisches Museum Hamburg, www.zobodat.at

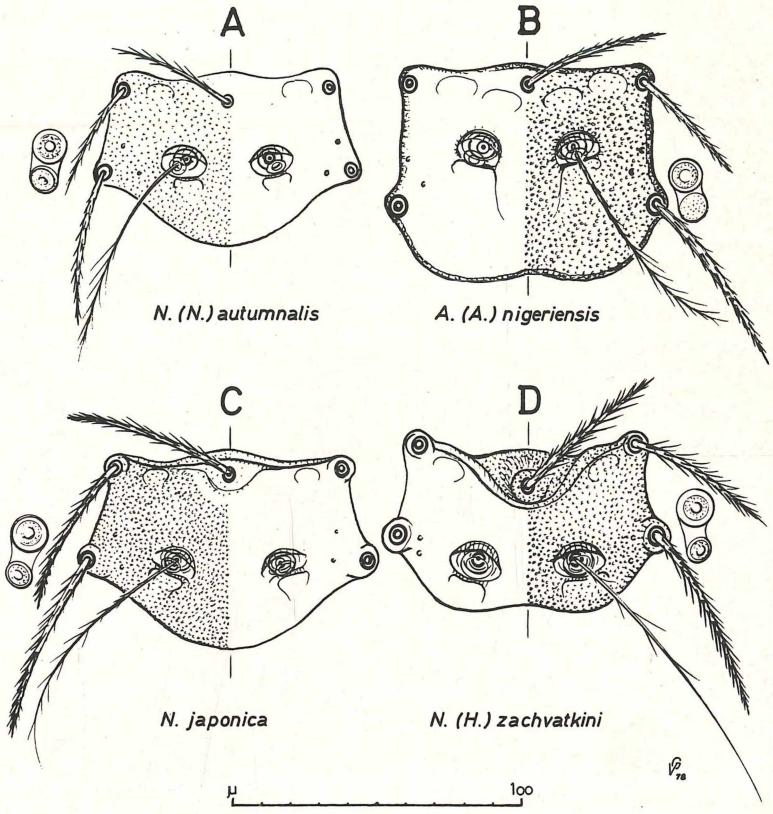


Plate 9. Three basical scuta of *Neotrombicula* (A, C & D), compared with that of *Afrotrombicula* (B).

a new genus to be erected in the large revision in preparation. All of the 13 species included are provided with 2 protorostralae bearing few long branches. Its scutal pattern matches also with that of the members of two groups characterized by the presence of multiple mastisetae on the hind legs (former *microti* and *bisignata* species groups; to be arranged in 2 new subgenera, later, and involving about 36 species). D - *Neotrombicula (Hirsutiella) zachvatkini* (SCHLÜGER,1948,SCHLÜGER & VISOTZKAIA,1970: involving only 3 species, abundantly pilose and with generously branched protorostralae.

©Zoologisches Museum Hamburg, www.zobodat.at

Change of name

The species, *Neotrombicula (Neotrombicula) sciuri* KOLEBINOVA, 1969, was a primary homonym of *Neotrombicula (Neotrombicula) sciuri* TAUFFLIEB,1966. Consequently it was changed into,*Neotrombicula (Neotrombicula) sciuricola* KOLEBINOVA,1970. As for TAUFFLIEB's species, according to the present work and the erection of the subgenus *Tauffliebicula,* it is become: *Neotrombicula (Tauffliebicula) sciuri* (TAUFFLIEB,1966) comb. nov.. This goes also for *N. (Tauffliebicula) machadoi* (TAUFFLIEB,1962) comb. nov..

Abbreviations

The abbreviations and the anatomical definitions used in this work can be found, fully explained in:

1) 'The Chigger Mites of the Far East', P.H.VERCAMMEN-GRANDJEAN,1968, 135pp.
2) 'The Chigger Mites of the World', Vol.III--*Leptotrombidium* Complex, Sec.A, B & C, 1362 pp., P.H.VERCAMMEN-GRANDJEAN & R.LANGSTON, 1975-76.

However for reasons of readers' conveniences :

A - Abbreviations in Diagnoses paragraphs:

SIF = Synthetic Identification Formula = fT-Ga-Od-ga.gm.gp.tp.MT.Mt.MG.MF. (see below).
fT = palpotarsal pilous formula (3B to 7B.S), in which 3B to 7B is the number of barbed setae or homologous, and S à special nude 'Subterminala'. Being constant, the externo-basal solenidion (S_ω) is not represented: only variables are.
Ga = nature, nude(N) or branched(B), of the galeala (or protorostral seta).
Od = number of prongs on the palpotibial claw or odontus(1-12, more often 3).
ga, gm gp = number (or dimensions) of ant-, mid-, post- pedogenualae.
ta, tm, tp = id. for pedotibialae.
MT, Mt, MG, MF = number (dimensions) of mastisetae on tarsus, tibia genu & femur of hind legs.
Ip = 'Index pedibus'= pa + pm + pp = sum of the 3 leg lengths; a conventional indication of the relative size of a mite (legs' segments are constant; the body dimensions varies during feeding).
fPp = palpal pilous formula (fT except).
fsp = leg segmentation formula.
fCx = coxal pilous formula.
fSt = sternal pilous formula.
ST, pST = subterminala, parasubterminala of anterior pedotarsus.
PT',PT" = pretarsalae of anterior & median pedotarsi.
fD = dorsal body setation formula.
fV = ventral body setation formula.
NDV = ND + NV = sum of dorsal + ventral body setae numbers.
u = uropore, in fV formula.
M/.. = Mean of/ N specimens.
S_ω,S_1,S_2 = Solenidia on palpotarsus, and ant- & mid- pedotarsi.
f_1,f_2 = famuli (microspurs) on ant- & mid- pedotarsi.
LST = Leg Setae Tabulation; a synoptic association of 12 numbers of great

©Zoologisches Museum Hamburg, www.zobodat.at

constancy & revealing important in classification; each is of ordinairy barbed setae on tarsus, tibia, genu & femur (T.t.G.F.) of the three legs (a.m.p).

B - Abbreviations in Classical Measurements: (all in micra = µm)

AW, PW, PW', PW" = widths between AL, PL, PL' & PL" scutal setae (base centers).
AL, PL, PL', PL" = lengths of anterolateral(AL), posterolateral(PL) & post-posterolateral setae (PPL = PL' & PL"; or PM & PM' when these setae are more central or median on the scutum).
AP = width between AL & PL.
PPL = post-posterolateral scutal setae.
AM = anteromedian scutal seta.
S or Tb = sensilla or trichobothria(length).
SB = width between sensillary bases.
ASB = distance between scutal antero-margin & SB.
PSB = idem between postero-margin & SB.
SD = ASB + PSB = total scutal length.
H = humerala, or humeral seta(+ length).
D, V = dorsal and ventral setae(+ length).
P = pygosomal setae (on hemispheric area of the opisthosoma).
Pygosomal: standing for 'caudal' (improper term), from pygosoma or pygosome (= hemispheric area, bottom of the opisthosoma).

Literature

ANDRE, M.,1951: Nouvelle espèce de *Schoengastiella* (Acarien) d'Afrique Équatoriale.- Bull.Mus.nat.Hist.nat., (2) *23* (4): 368-371. Paris.

AUDY, J.R., R.F. LAWRENCE & P.H. VERCAMMEN-GRANDJEAN,1961: Trombiculidae. In ZUMPT, F. (Ed.): The Arthropodes parasites of Vertebrates in Africa South of the Sahara (Ethiopian Region). Vol. I (Chericerata), in Publ. S.Afr.Inst.Med.Res., Johannesburg, n°1, Vol.9: 457pp.

LE GAC, P.,1952: Contribution à l'étude des Acariens des genres *Trombicula, Schoengastia & Schoengastiella* recueillis sur des rongeurs de l'Oubangui-Chari (A.E.F.).- Bull.Soc.Pathol.Exot., *45* (6): 747-749. Paris.

JADIN, J.B. & P.H. VERCAMMEN-GRANDJEAN,1952: Douze nouvelles espèces de Trombiculidae du Ruanda-Urundi.- Ann.Soc.Belge Méd.Trop., *32:* 605-641. Bruxelles.

SCHOUTEDEN, H.,1947: De Zoogdieren van Belgisch Congo en van Ruanda-Urundi.- Ann.Mus.R.Congo Belge,Zool., (2) *3* (1-3): 576pp.; Tervuren.

TAUFFLIEB, R. & J. MOUCHET,1959: Revue des Trombiculidae du Cameroun et description de huit espèces et sous-espèces nouvelles.- Acarologia, *1* (2): 228-245. Paris.

TAUFFLIEB, R.,1964: Les *Schoengastiella* (Acarina:Trombiculidae) de la région subsaharienne.- Acarologia, *5* (3): 455-475. Paris.

©Zoologisches Museum Hamburg, www.zobodat.at

TAUFFLIEB, R.,1965: Le sous-genre *Gahrliepia* (Acarina:Trombiculidae) en Afrique subsaharienne.- Acarologia, *7* (3): 510-522. Paris.

TAUFFLIEB, R.,1966: Deux nouvelles espèces de *Neotrombicula* et clé des espèces subsahariennes du genre.- Acarologia, *8* (2): 296-301. Paris.

VERCAMMEN-GRANDJEAN, P.H.,1952: Considérations sur la sous-famille Walchiinae, Ewing,1946, et création d'un nouveau genre dans cette sous-famille.- Ann.Soc.Belge Méd.Trop., *32:* 642-644. Bruxelles.

VERCAMMEN-GRANDJEAN, P.H.,1960: *Gahrliepia moucheti,* un Trombiculidae larvaire nouveau, parasite des oreilles de *Chlorotalpa stuhlmanni* (Acarina).- Acarologia, *2* (2): 214-216. Paris.

VERCAMMEN-GRANDJEAN, P.H.,1968: The Chigger Mites of the Far East (Acarina: Trombiculidae & Leeuwenhoekiidae). Special Study. U.S.Army Med. & Res. Develop.Com., Washington, D.C. 135pp.

VERCAMMEN-GRANDJEAN, P.H. LANGSTON, R.L. & AUDY, J.R.,1973: Tentative nepophylogeny of Trombiculids.- Folia Parasitol., *20:* 49-66. Praha.

WOMERSLEY, H.,1952: The scrub-typhus and scrub-itch mites (Trombiculidae, Acarina) of the Asiatic-Pacific region.- Rec.S.Austr.Mus., *10* (2pts.): 673 pp.; Adelaide.

Address of the authors

Dr. MARIA KOLEBINOVA, Bulgarische Akademie für Wissenschaften, Zoologisches Institut, Boulv. Ruski 1, Sofia, Bulgarien.

Dr. PAUL H. VERCAMMEN-GRANDJEAN, 2062 - 20th Avenue, San Francisco, California 94116, U.S.A.

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg

Jahr/Year: 1977

Band/Volume: 6

Autor(en)/Author(s): Kolebinova Maria, Vercammen-Grandjean P. H.

Artikel/Article: Five new larval Trombiculidae (Acarina) from Liberia and one from Zaire 101-131