

## FURTHER STUDIES ON THE FAMILY CHEYLETIELLIDAE (ACARINA)

BY

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### ABSTRACT

The family Cheyletiellidae is divided into five subfamilies based on differences in habitat, host preferences, and on morphological features. These are : Ornithocheyletiinae, n. subfam., Teinocheyletinae, n. subfam., Criokerontiinae, n. subfam., and Niheliinae, n. subfam., and Cheyletiellinae. A key is provided for subfamilial separation and differentiation. New species of *Ornithocheyletia* Volgin and *Neocheyletiella* Baker are described and illustrated. New keys to the species of these genera are included. Heteromorphic males are now known to occur in the Ornithocheyletiinae. The males and nymph are described and illustrated for *Ornithocheyletia hallae* Smiley. Developmental stages of this species (eggs and larvae) have been found in the epidermal tissues of a pigeon with thick scales caused by hyphae of an actinomycete, suggesting that the species may be partially endoparasitic.

### RÉSUMÉ

La famille des Cheyletiellidae est divisée en cinq sous-familles nouvelles basées sur des différences dans l'habitat, les hôtes préférentiels et les caractères morphologiques. Ce sont : les Ornitocheyletiinae, les Teinocheyletinae, les Criokerontiinae et les Niheliinae Cheyletiellinae. Une clé de détermination de ces cinq sous-familles est donnée. De nouvelles espèces d'*Ornithocheyletia* Volgin et de *Neocheyletiella* Baker sont décrites, accompagnées de nouvelles clés de ces genres. Des mâles heteromorphiques sont maintenant connus chez les Ornithocheyletiinae. Les mâles et la nymphe d'*Ornithocheyletia hallae* Smiley sont décrits. Les œufs et les larves de cette espèce ont été trouvés dans les tissus épidermiques d'un pigeon, dans d'épaisses squames provoquées par les hyphes d'un actinomycète, ce qui laisse penser que l'espèce peut être partiellement endoparasite.

Cheyletiellid mites are parasites of mammals and birds and as such are of importance to agriculture, veterinarians, parasitologists, and the U.S. Public Health Service. In 1970 I raised the subfamily Cheyletiellinae to familial rank. In the present study the family Cheyletiellidae is divided into five subfamilies based on differences in habitat, host preferences, and on morphological structures. The subfamilies are : Cheyletiellinae, Ornithocheyletiinae, Teinocheyletinae, Criokerontiinae and Niheliinae. The subfamily Cheyletiellinae contains the genera *Eucheyletiella* Volgin and *Cheyletiella* Canestrini. These mites are found on man, dogs, cats, rabbits, foxes, and badgers. They cause a dermatitis to man as well as to other hosts (KEH, 1973 ; KEH, 1975 ; and van BRONSWIJK et al., 1972). Teinocheyletinae consist of a monotypic genus from

a rodent. The Ornithocheyletiinae are found only on birds. HAARLØV and MØRCH (1975) and HAARLØV (in press), in a clinical and morphological study on *Ornithochyletia hallae* Smiley on pigeons, describe the male gnathosoma and give details of the mite's interaction with the pigeon's skin. HAARLØV (in press) states "the skin shows no inflammatory reactions, but in epidermis edemata are visible combined with blisters, and a strong hyperkeratosis is seen, resulting in a 1-2 mm thick layer of scales, which is the very habitat of the mite. The scales are almost coherent caused by hyphae of an actinomycete which is known to be proteolytic. Where the hyphae are abundant, scales may almost be digested and in those places eggs and larvae are found in greatest numbers".

Heteromorphic males with modified palpi have been reported in the Cheyletidae (BAKER, 1949; SMILEY and MOSER, 1975; and SMILEY, in press). Heteromorphic males of *O. hallae* are reported here for the first time; this is the first record of the heteromorphic male form in the family Cheyletiellidae. The Niheliinae are found on squirrels and Criokerontinae are found on lemurs and mongooses. *Ornithochyletia barri* and *Neocheyletia vestergaardi* are described and illustrated. New keys to species are provided for these genera.

Since my study (1970), the literature has increased considerably. For reviews of the taxonomy and host preferences of species of Cheyletiellidae, consult GETHING (1973), van BRONSWIJK et al. (1972), and de KREEK (in press).

#### FAMILY CHEYLETIELLIDAE VOLGIN, 1966

*Diagnosis.* — Small to medium sized; body elongate or semioval, with a weak furrow or fine striae separating propodosoma and hysterosoma. One to 3 dorsal shields present. Eye absent. Chelicerae short and styletlike. Peritreme present at base of chelicerae, with shape, size, and number of segments varying; in most genera peritreme M-shaped, with 3-15 pairs of elongate, sausage-shaped segments noncompressed and nonlayered, except Criokerontinae, which has 10-30 pairs of elongate, sausage-shaped segments compressed into 3 layers. Palpi large or minute, simple, without comblike setae, with or without sicklelike setae, with or without teeth on palpal claw; palpal claws usually curved ventrally. True claws and padlike to clawlike empodium with tenant hairs found in all subfamilies except Cheyletiellinae. Male genital opening dorsal; aedeagus projecting anteriorly or posteriorly. Dorsal body setae simple, serrate, squamose, saberlike, or transparent leaflike. Ectoparasites of vertebrates.

#### Key to Subfamilies

1. Tarsi I-IV with claws..... 2  
    Tarsi I-IV without claws; on cats, dogs, hares and rabbits..... Cheyletiellinae Volgin
2. Body semioval; distal portion of idiosoma without lobelike projections; not on rodents.. 3  
    Body elongate; distal portion of idiosoma with lobelike projections; on rodents..... Teinocheyletinae n. subfam.
3. Gnathosoma modified, with large spines or clawlike appendages directed ventrally; on mammals .. 4  
    Gnathosoma normal without large spines or clawlike appendages directed ventrally; on birds.. Ornithocheyletiinae n. subfam.

4. Palpal femur with spurlike apophyses ; on lemurs and mongooses.....  
Niheliinae n. subfam.  
Palpal femur without spurlike apophyses ; on squirrels and tree shrews.....  
Criokerontinae n. subfam.

SUBFAMILY CHEYLETIELLINAE VOLGIN, 1966 : 218

Type-genus. — *Cheyletiella* Canestrini, 1886 : 169.

*Diagnosis.* — Tarsi I-IV without claws but with strong, rayed empodia. Coxae I with or without spurlike apophysis. Coxae I and II widely separated from III and IV. Peritreme M-shaped, consisting of 10-12 pairs of segments. Females with 1 propodosomal shield bearing 3 pairs of anterolateral serrate setae, with or without 2 pairs of posteromedial simple setae, with 2 pairs of serrate setae adjacent to shield. Hysterosoma without shields, sometimes with small platelets between 1st pair of simple setae and 1st pair serrate setae, with 2 or 3 pairs of serrate setae and 4 pairs of simple setae. Males dorsally with propodosomal shield as in female. Hysterosomal shield with or without anterior pair of simple setae, with 3 pairs of simple setae posteriorly, anteriorly and adjacent to shield, with 1 pair of long, serrate setae, distally with 2 pairs of setae, terminating with 1 pair of long, serrate setae. Aedeagus projecting dorsoposteriorly. Body semioval. Ectoparasites of cats, dogs, hares, and rabbits.

Key to Genera of Cheyletiellinae

1. Propodosomal shield of male and female with 2 pairs of strong, simple setae dorsomedially..  
*Cheyletiella* Canestrini  
Propodosomal shield of male and female without strong, simple setae dorsomedially.....  
*Eucheyletiella* Volgin

For a key to species of these genera refer to Smiley (1970).

1. Genus *Cheyletiella* Canestrini, 1886 : 169.  
Type-species : *Cheyletus parasitivorax* Megnin, 1878 : 425.  
2. Genus *Eucheyletiella* Volgin, 1960 : 238.  
Type-species : *Cheyletiella ochotana* Volgin, 1960 : 238.

SUBFAMILY TEINOCHEYLETINAE, NEW SUBFAMILY

Type-genus. — *Teinocheylus* Fain, 1975 : 271.

*Diagnosis.* — Based on a single female specimen. Idiosoma long, narrow. Dorsum with 3 shields. Distal hysterosoma terminating with 1 pair of lobelike projections, bearing 3 pairs of dorsal and 1 pair of ventral, serrate setae. Dorsum with simple, serrate, and transparent leaflike setae. Gnathosoma small, long, and triangular shape, snoutlike anteriorly, extending beyond palpi. Palpi 4-segmented ; tarsus with conspicuous sicklelike seta. Peritreme with 3-4 pairs of segments. Coxae I and II converging, widely separated from coxae III and IV ; coxae III and IV not converging, widely separated from each other. Tarsi I-IV with 2 claws

and rayed empodium. According to FAIN (1975), rayed empodia have been observed on tarsi IV only. Found on rodents.

1. Genus *Teinocheylus* Fain, 1965 : 271.

Type-species : *Teinocheylus longissimus* Fain, 1975 : 271.

SUBFAMILY ORNITHOCHEYLETIINAE, NEW SUBFAMILY

Type-genus. — *Ornithocheyletia* Volgin, 1964 : 28.

*Diagnosis.* — Palpal tarsus with small claw. Peritreme with 3-5 pairs of segments. Tarsi with dorsal protuberance, laterally with 1 strong, serrate seta, sometimes forked; claw weak, small to moderate sized or strong, stout and large, with rayed empodium. Coxae I and II converging, separated from coxae III and IV. Female dorsum with 1 propodosomal shield bearing 1-4 pairs of simple or serrate setae, or combination of both kinds of setae. Hysterosoma without or with 1-2 dorsal shields; anterior shield square, with 1-3 pairs of simple setae. Males dorsally with or without propodosomal shields. Aedeagus may project dorsoanteriorly or dorsoposteriorly. Found on birds.

Key to genera of Ornithocheyletiinae

1. Male with aedeagus projecting posteriorly; ♀ with 1-3 dorsal shields; tarsal claws small and weak; tarsi I-IV flanked by simple, split or fork-shaped seta..... 2

Male with aedeagus projecting anteriorly; ♀ with 1 dorsal shield; tarsal claws massive and strong; tarsi I-IV flanked by strong, featherlike seta..... 3

2. Female without hysterosomal shield; ♂ with 2 pairs of anterior, dorsocentral hysterosomal setae ..... *Bakericheyla* Volgin

Female with hysterosomal shield; ♂ with 1 pair of anterior, dorsocentral hysterosomal setae.. *Ornithocheyletia* Volgin

3. Female with coxae II bearing 2 setae; ♂ with aedeagus extending to propodosomal shield.. *Ornithocheyla* Lawrence

Female with coxae II bearing 1 seta; ♂ with aedeagus not extending to propodosomal shield.. *Neocheyletiella* Baker

1. Genus *Ornithocheyletia* Volgin, 1964 : 28.

Type-species : *Ornithocheyletia dubinini* Volgin, 1964 : 28.

Key to Species of *Ornithocheyletia* Volgin

Key to males [adapted from Haarløv (in press)]

1. Idiosoma without pair of long setae terminally..... 2  
Idiosoma with pair of long setae terminally..... *canadensis* (Banks)

2. Hysterosoma without serrate setae..... 3  
Hysterosoma with serrate setae..... 5

3. Anterolateral setae on propodosomal shield simple or simple and serrate..... 4  
Anterolateral setae on propodosomal shield serrate..... *dubinini* Volgin
4. Laterodorsal propodosoma with simple setae, 3rd pair subequal in length to 4th pair....  
*gersoni* Smiley  
Laterodorsal propodosoma with simple and serrate setae, 3rd pair simple, more than 4 × length of 4th serrate pair..... *hallae* Smiley
5. Venter of idiosoma with 1 pair of simple setae adjacent to coxae I..... 6  
Venter of idiosoma with 1 pair of serrate setae adjacent to coxae I.... *lawrenceae* Smiley
6. Aedeagus short, straight..... *volgini* Smiley  
Aedeagus long, curved ..... *lukoschusi* Smiley

Key to Females

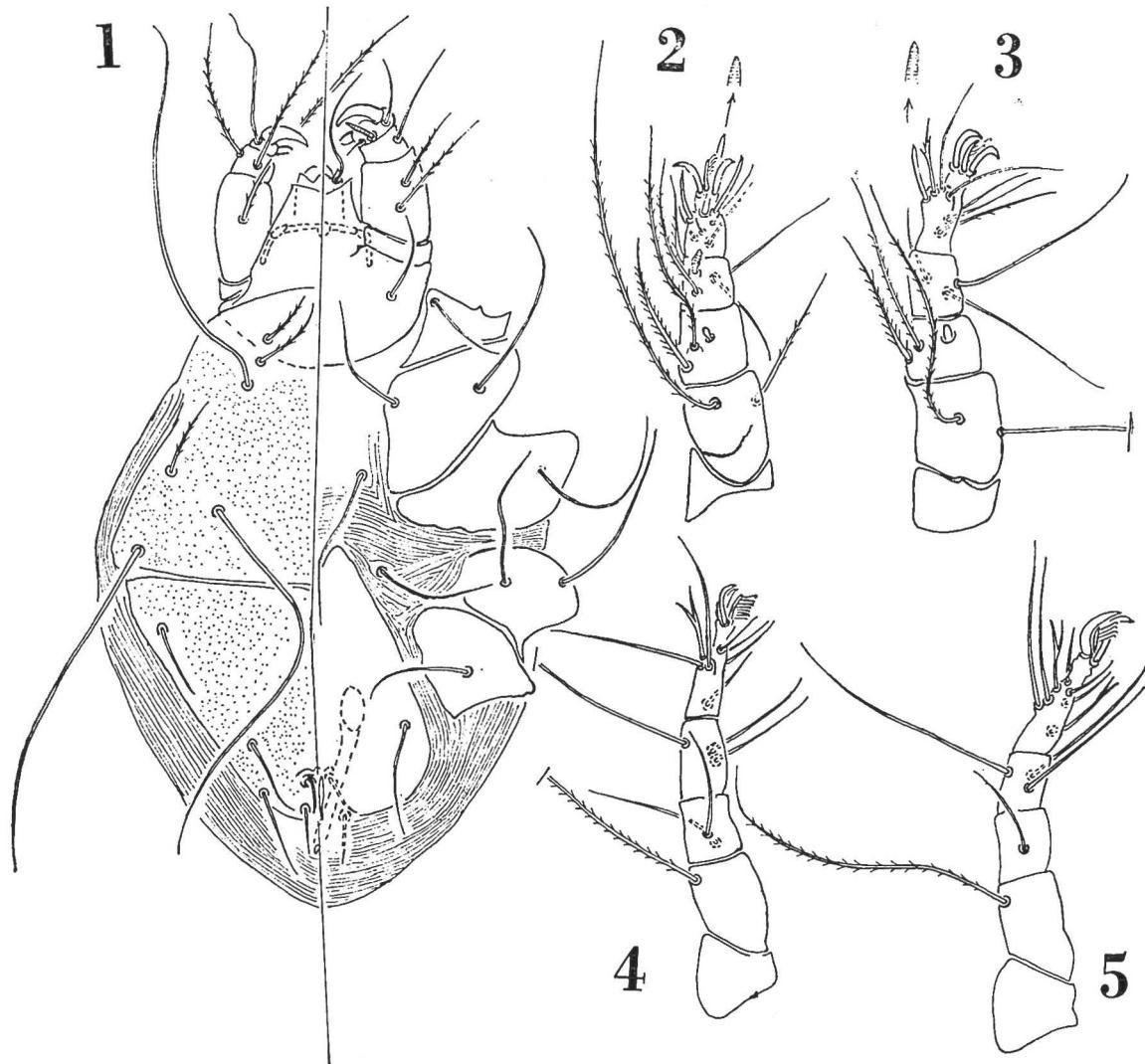
1. Tarsus I with dorsal protuberance..... 2  
Tarsus I without dorsal protuberance..... *pinguis* (Berlese)
2. Hysterosomal shield with 1-3 pairs of simple setae..... 3  
Hysterosomal shield with 2 pairs of serrate setae ..... *canadensis* (Banks)
3. Propodosomal shield distinctively separated from hysterosomal shield by transverse stria-  
tion. .... 4  
Propodosomal shield not separated from hysterosomal shield by transverse stria-  
tion..... *dubinini* Volgin
4. Opisthosomal shield without setae..... 5  
Opisthosomal shield with 1 pair long, simple setae..... *hallae* Smiley
5. Coxae III and IV without spurs..... 6  
Coxae III and IV with spurs..... *lawrenceae* Smiley
6. Distal hysterosomal shield without long pair of simple setae subequal in length to medial  
setae on propodosomal shield ..... 7  
Distal hysterosomal shield with long pair of simple setae subequal in length to medial setae  
on propodosomal shield..... *barri* n. sp.
7. Distal idiosoma with 1 pair of long simple setae..... 8  
Distal idiosoma with 2 pairs of long simple setae..... *gersoni* Smiley
8. Hysterosomal shield with 1 pair of setae..... *volgini* Smiley  
Hysterosomal shield with 2 pairs of setae..... *lukoschusi* Smiley

Ornithocheyletia *hallae* Smiley  
(Figs. 1-15)

The male of this species is distinctive from other species by having the lateral seta (humeral seta of some authors) on the propodosomal shield.

*Normal Male* (Figs. 1-5). Gnathosoma with distal part cone shaped dorsally, proximal part semicircular shaped. Rostrum indented anteriorly ; dorsally with 1 small pair of simple setae, ventrally with 1 large pair of simple setae as figured, ventral proximal part with 1 simple

seta adjacent to palpal trochanter. Palpi short and strong; palpal femur with 1 dorsal and 2 ventral serrate setae; genu with 1 ventral simple seta and 2 dorsal serrate setae; tibia with 1 long, dorsal, finely serrate seta, 2 simple setae and 1 solenidion ventrally, laterally with 2 short, strong, sicklelike setae. Claw curved downward, without teeth. Peritreme with 3 pairs of segments.



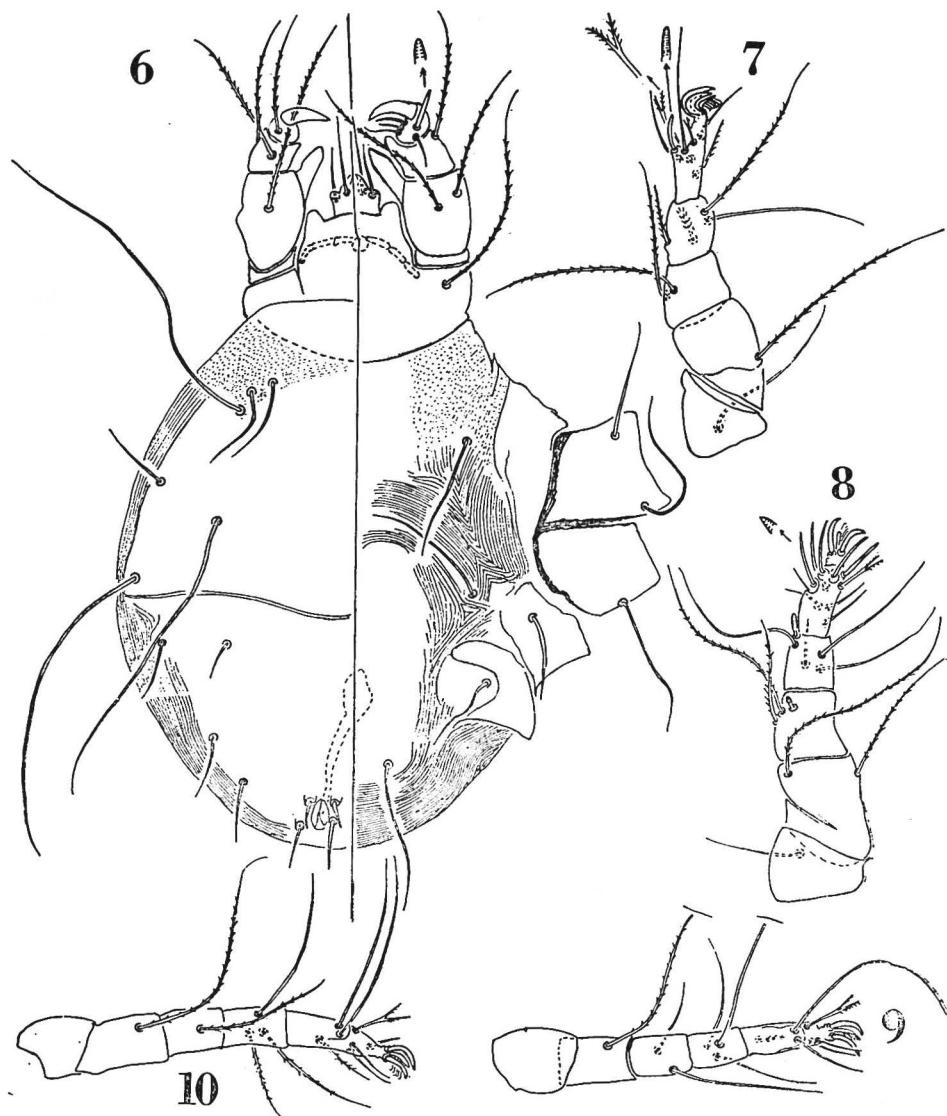
FIGS 1-5 : *Ornithochyletia hallae* Smiley. Normal Male. 1) Dorsal and ventral view of idiosoma ; 2) Right leg I ; 3) Right leg II ; 4) Right leg III ; 5) Right leg IV.

*Dorsum*. — Idiosoma truncate anteriorly, tapering posteriorly. Propodosoma wider than long, with 3 laterodorsal pairs of weakly serrate setae and 2 pairs of simple setae, 1st pair (anteriorly) serrate, not as long as 2nd serrate pair, 3rd pair simple, more than 4 times longer than 1st and 2nd pair, 4th pair serrate, subequal in length to 3rd pair, with medial pair of simple setae, subequal in length to 3rd anterolateral pair, with 1 lateral pair of simple setae, subequal in length to medial pair, medial pair present on propodosomal shield. Hysterosoma with 4 pairs of simple

setae, distal pair longest, with 3 pairs of genital setae, anterior pair thicker than 2nd and 3rd pairs, 2nd pair smallest, 3rd pair longest.

*Venter*. — Propodosoma and hysterosoma as figured. Coxal setal formula : 2-1-2-1. Setation on femur, genu, tibia, and tarsus of leg I : 2-2 + 1 solenidion -4 + 1 solenidion -5 + 3 eupathida + 1 solenidion ; leg II, femur, genu, tibia, and tarsus : 2-2-4-7 + 1 solenidion ; leg III, femur, genu, tibia, and tarsus : 1-2-3-7 ; leg IV, femur, genu, tibia, and tarsus : 1-1-3-7. Claws and empodium as figured. Body 319  $\mu$  long, 199  $\mu$  wide.

*Heteromorphic male* (Figs. 6-10). — Gnathosoma with distal part elongate, with lateral protuberance, proximal part semicircular. Rostrum indented anteriorly, with strong, lateral pro-



FIGS. 6-10 : *Ornithochyletia hallae* Smiley. Heteromorphic Male.

6) Dorsal and ventral view of idiosoma ; 7) Right leg II ; 8) Right leg I ; 9) Right leg II ; 10) Right leg IV.

tuberance, anterodorsal and ventral parts each with 1 pair simple setae. Protegmen with lateral protuberance. Ventral proximal part with 1 simple seta adjacent to palpal trochanter. Palpi short, strong; palpal femur with 2 ventral and 1 dorsal serrate setae, with strong apophysis on inner margin; genu-with 1 ventral and 1 dorsal serrate seta, tibia with 1 dorsal, serrate seta, 2 ventral simple setae and 1 dorsal solenidion, laterally with 2 short strong sicklelike setae. Claw curved downward, without teeth. Peritreme with 3 pairs of segments.

*Dorsum*. — Idiosoma truncate anteriorly, tapering posteriorly. Propodosoma wider than long, with 3 pairs of weakly serrate setae and 3 pairs of simple setae, 1st pair (anteriorly) serrate, not as long as 2nd serrate pair, 3rd pair simple, more than 4 times longer than 1st and 2nd pairs, 4th pair serrate, subequal in length to 3rd pair, with 1 medial pair of simple setae, subequal in length to 3rd anterolateral pair, lateral pair simple, subequal in length to medial pair, lateral pair present on propodosomal shield. Hysterosoma as figured, with 4 pairs of simple seta, distal pairs longest, with 2 pairs of genital setae, anterior pair thicker, shorter than posterior pair.

*Venter*. — Propodosoma and hysterosoma as figured. Coxal setal formula : 2-1-2-1. Setation on femur, genu, tibia, and tarsus of leg I : 2-2 + 1 solenidion -5 + 3 eupathidia + 1 solenidion, leg II, femur, genu, tibia, and tarsus : 2-2-3-7, leg IV, femur, genu, tibia, and tarsus : 1-1-3-7. Claws and empodia as figured. Body 306  $\mu$  long, 186  $\mu$  wide.

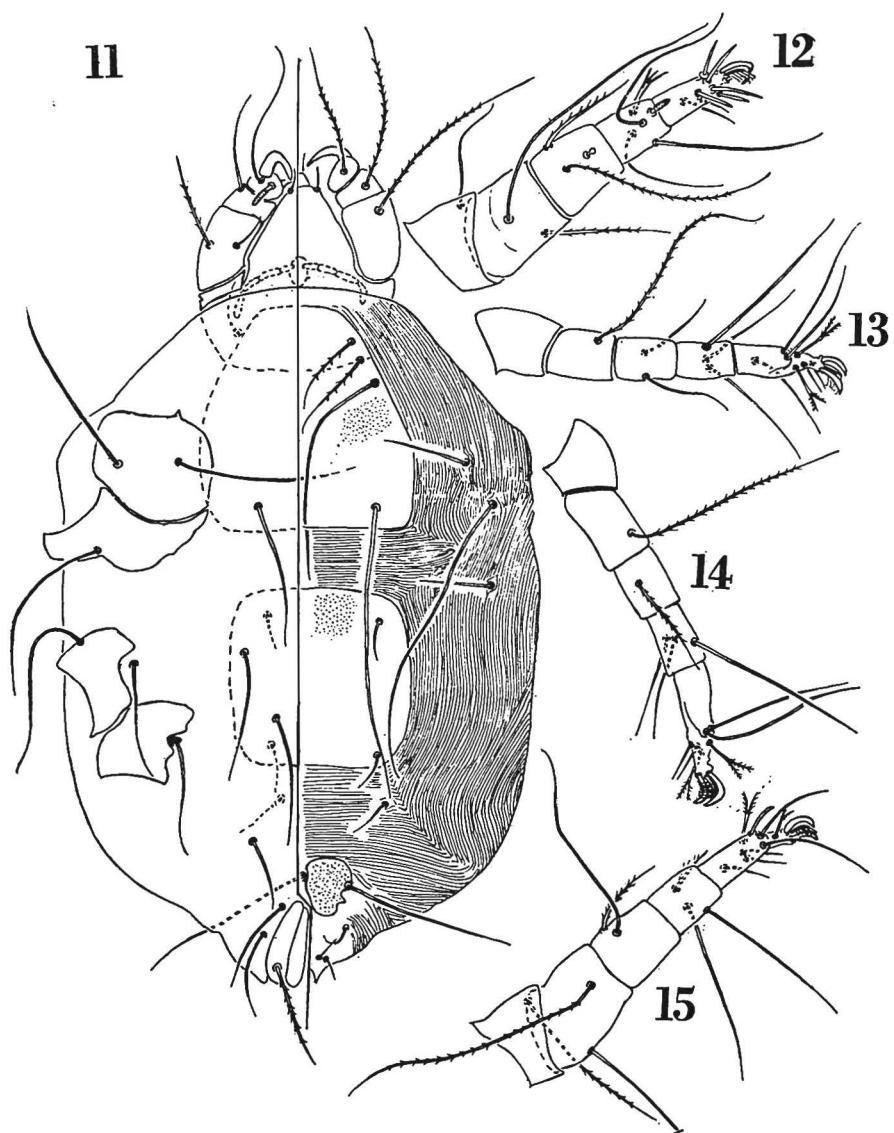
*Nymph* (Figs. 11-15). — Distal part of gnathosoma cone shaped, proximal part truncate. Rostrum semicircular anteriorly, distally with 1 dorsal and 1 ventral pair of simple setae, ventral proximal part with 1 simple seta adjacent to palpal trochanter. Palpi short and strong; palpal femur with 1 dorsal serrate seta, ventrally with 1 simple and 1 serrate seta; genu with 1 ventral simple seta, and 1 dorsal serrate seta; tibia with 1 dorsal serrate seta, ventrally with 1 simple seta, 1 solenidion and 2 small sicklelike setae. Claw curved downward, without teeth. Peritreme with 3 pairs of segments.

*Dorsum*. — Idiosoma semi-oval, tapering posteriorly. Propodosoma wider than long; shield with 2 pairs of simple and 2 pairs of serrate setae, distal simple pair longest, extending beyond hysterosomal shield, with 2 pairs of lateral simple setae adjacent to shield. Hysterosomal shield separated from propodosoma by fine striae; hysterosomal shield with 2 pairs of simple setae, with a lateral pair of simple setae adjacent to shield, and shorter pair below shield. Metapodosoma with 1 shield, bearing 1 pair of simple setae.

*Venter*. — Propodosoma and hysterosoma as figured. Coxal setal formula : 2-1-2-1. Setation on femur, genu, tibia, and tarsus of leg I : 2-2 + 1 solenidion -4 + 1 solenidion -4 eupathidia + 5 + 1 solenidion; leg II, femur, genu, tibia and tarsus : 2-2-3-7 + 1 solenidion, leg III, femur, genu, tibia, and tarsus : 1-2-3-7, leg IV, femur, genu, tibia, and tarsus : 1-1-3-7. Claws and empodia as figured. Body 386  $\mu$  long, 239  $\mu$  wide.

*Specimens Examined*. — Seventeen males, 1 female, 1 heteromorphic male, 6 nymphs, and many unmounted specimens. This material was collected from 3 barn yard pigeons, 24 July 1972, Canoga Park, California by Mr. T. P. GARGAN.

*Distribution*. — USA ; Texas and California. Europe ; Denmark and England.



FIGS. 11-15 : *Ornithochyletia hallae* Smiley. Nymph. 11) Dorsal and ventral view of idiosoma ; 12) Right leg I ; 13) Right leg III ; 14) Right leg IV ; 15) Right leg II.

**Ornithocheyletia barri, n. sp.**

(Figs. 16-20)

This species is distinguished from other species of the genus by having 1 pair of simple setae distally on the hysterosomal shield, which are subequal in length to medial setae on propodosomal shield.

*Female.* — Gnathosoma with distal part cone shaped and proximal part truncated. Rosstrum semicircular anteriorly, distally with 1 dorsal and 1 ventral pair of simple setae, ventral proximal part with spurlike apophysis and simple seta, adjacent to palpal trochanter. Palpi short and strong; palpal femur with 1 dorsal serrate seta, ventrally with 1 simple, and 1 serrate seta; genu with 1 ventral simple seta and 1 dorsal serrate seta; tibia with 1 dorsal serrate seta, ventrally with 1 simple seta, (solenidion and 2 sicklelike setae normally found on this appendage not visible). Claws curved downward, without teeth. Peritreme with 3 pairs of segments.

*Dorsum.* — Idiosoma semi-oval, truncate posteriorly. Propodosoma wider than long; shield with 3 pairs of setae, and 1 medial pair of simple setae, adjacent to shield, (anteriorally) with 1 pair of serrate setae, below serrate pair, 1 pair of lateral simple setae. Hysterosomal shield separated from propodosoma by fine striae; hysterosomal shield with 3 pairs of simple setae, distal pair longest, 1 pair of simple setae below hysterosomal shield, subequal in length to distal pair on shield. Opisthosoma with a triangular-shaped shield bearing 1 pair of simple setae distally.

*Venter.* — Propodosoma and hysterosoma as figured. Coxal setal formula: 2-1-2-1. Setae on femur, genu, tibia, and tarsus of leg I: 2-2-3 + 1 solenidion -4 eupathidia + 5 + 1 solenidion, leg II, femur, genu, tibia, and tarsus: 2-2-5-7 + 1 solenidion, leg III, femur, genu, tibia, and tarsus: 1-2-3-7, leg IV, femur, genu, tibia, and tarsus: 1-1-3-7. Tarsi I with dorsal protuberance. Claws and empodia as figured. Body 399  $\mu$  long, 266  $\mu$  wide.

*Holotype.* — Female, U.S. National Museum of Natural History, No. 3707, collected from *Sturnus vulgaris* L., Davis, California, January 1968, by A. Ralph Barr. The species is known only from the holotype.

This species is named in honor of Dr. A. Ralph Barr, Division of Infectious and Tropical Diseases, School of Public Health, University of California at Los Angeles.

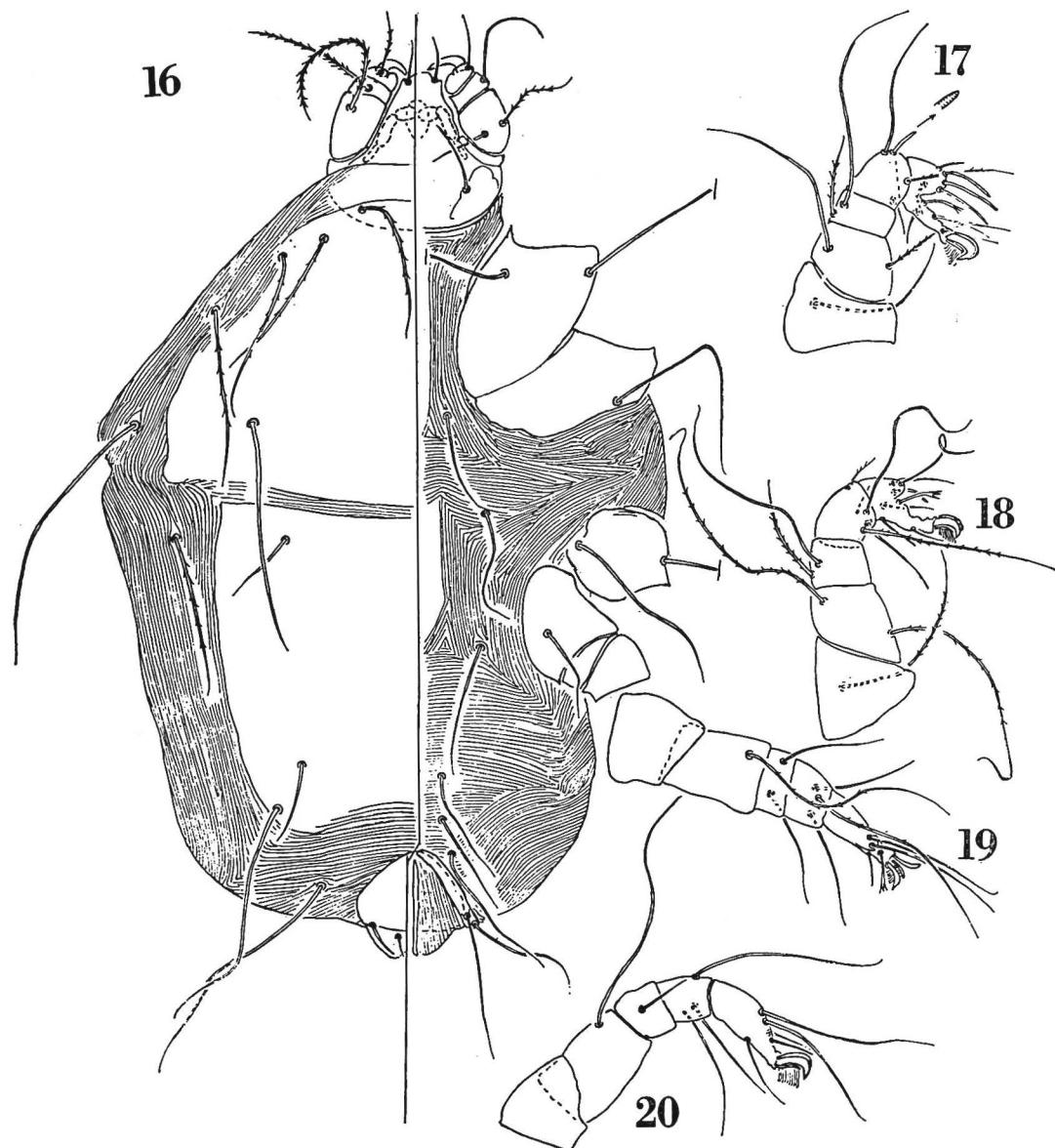
2. Genus *Neocheyletiella* Baker, 1949 : 271.

Type-species: *Neocheyletiella rohweri* Baker, 1949 : 271.

For a key to the males of this genus see Smiley (1970).

Key to Females of *Neocheyletiella* Baker

1. Epimera I separated from each other..... 2  
Epimera I joined to each other..... *microrhyncha* (Berlese and Trouessart)



FIGS. 16-20 : *Ornithochyletia barri*, new species. Female.

16) Dorsal and ventral view of idiosoma ; 17) Right leg I ; 18) Right leg II ; 19) Right leg III ; 20) Right leg IV.

- |   |                              |
|---|------------------------------|
| 2. Hysterosoma with dorsomedian setae.....  | 3                            |
| Hysterosoma without dorsomedian setae.....  | <i>macronycha</i> (Mégnin)   |
| 3. Dorsum with less than 10 pairs of serrate setae.....   | 4                            |
| Dorsum with 10 pairs of serrate setae.....  | <i>artami</i> Domrow         |
| 4. First 3 pairs of propodosomal setae approximately equal in length or 1st pair not as long as 2nd pair..... | 5                            |
| First 2 pairs of propodosomal setae much shorter than 3rd pair or 1st and 2nd pairs subequal in length.....   | <i>heteropalpus</i> (Mégnin) |
| 5. Dorsum with serrate and simple setae.....  | 6                            |
| Dorsum with simple setae only.....  | <i>vestergaardi</i> , n. sp. |
| 6. Posteromarginal setae slightly longer than anteromarginal setae; 1st pair posterior setae serrate .....    | 7                            |
| Posteromarginal setae about twice as long as anteromarginal setae; posterior setae simple..                   | <i>rohweli</i> Baker         |
| 7. Anterior hysterosoma with 1 pair of simple setae.....  | <i>smallwoodae</i> Baker     |
| Anterior hysterosoma with 2 pairs of simple setae.....  | <i>callawayae</i> Smiley     |

*Discussion.* — The type of *Neocheyletiella oudemansi* Volgin (1969) has not been examined. But based on the illustration of this species by Volgin, *N. callawayae* Smiley (1970) appears to be a junior synonym.

***Neocheyletiella vestergaardi*, n. sp.**

(Figs. 21-30)

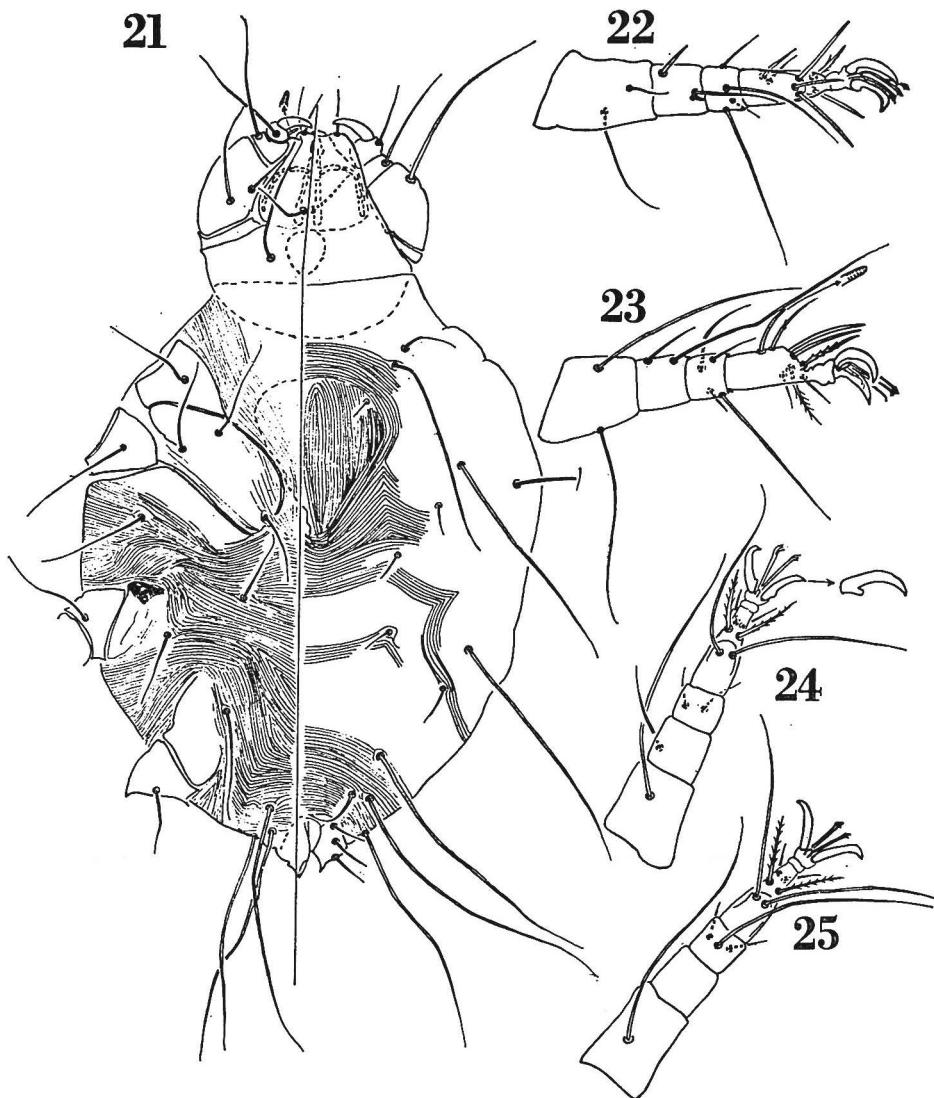
Both sexes of this species is distinguished from other species of the genus by having all simple setae on the dorsal idiosoma.

*Female.* — Gnathosoma with distal part cone shaped and proximal part truncate. Rostrum semicircular anteriorly, distally with 1 dorsal pair of simple setae, ventral surface with 1 medial pair of simple setae located above cheliceral, base with 1 proximal pair of simple setae, adjacent to palpal trochanter. Palpi short and strongly robust; palpal femur with 1 dorsal simple seta, ventrally with 2 simple setae; genu with 1 dorsal simple seta and 1 ventral simple seta; tibia with 1 dorsal simple seta, ventrally with 1 simple seta, 1 small solenidion and 2 small sicklelike setae. Claws curved downward. Peritreme composed of 3 pairs of segments.

*Dorsum.* — Idiosoma semicircular anteriorly and tapering posteriorly. Propodosoma wider than long, with striae forming an inconspicuous shield, posterior part clearly defined, submerged beneath cuticle striae. Shield as figured, with 1 pair of simple setae. First 3 pairs of propodosomal setae approximately equal in length to 1st pair, not as long as 2nd pair. Hysterosoma without shield. Dorsal propodosoma and hysterosoma with 6 pairs of short simple setae and 7 pairs of long simple setae. Genital area with 4 pairs of simple setae as figured.

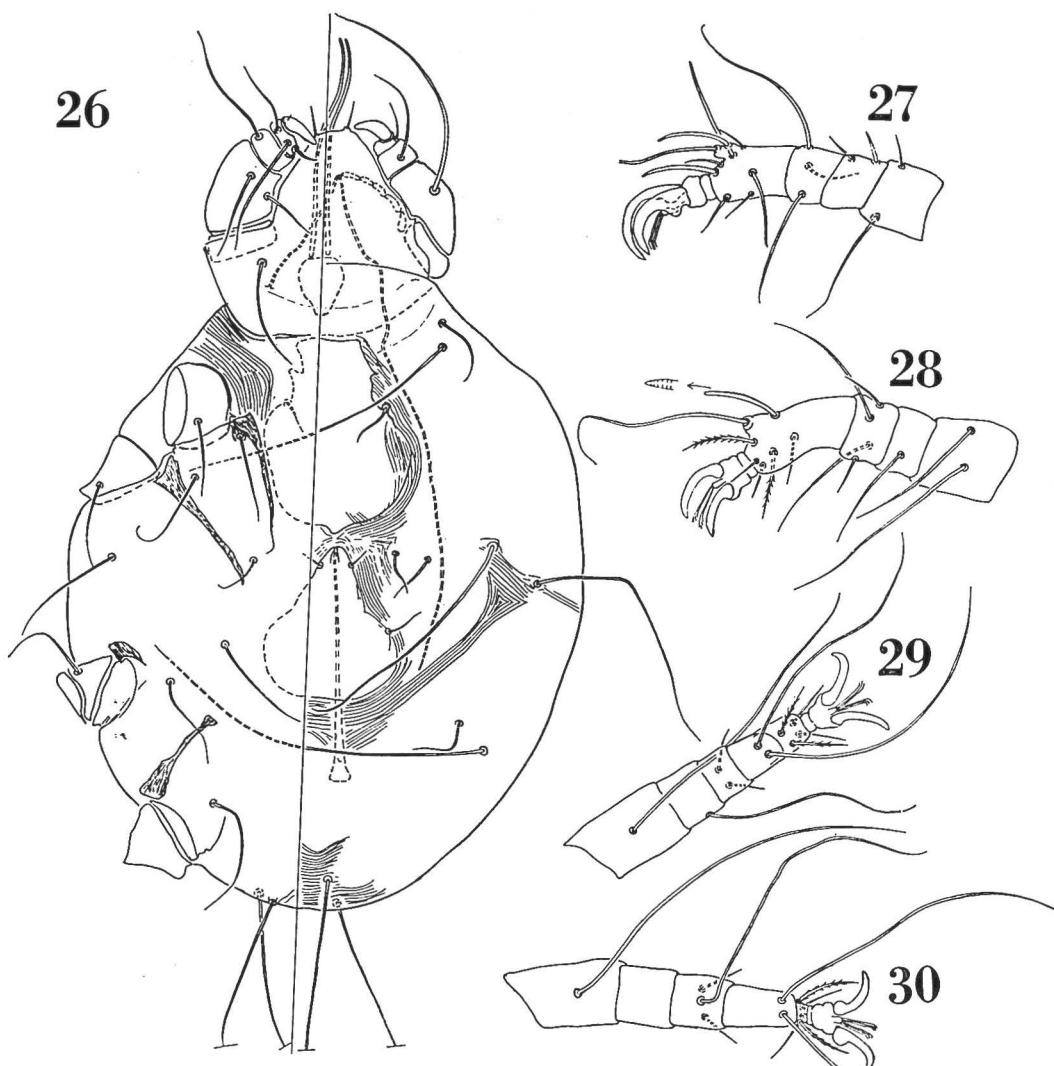
*Venter.* — Propodosoma and hysterosoma as figured. Epimera I separated from each other. Coxal setal formula: 3-1-1-1. Setation on femur, genu, tibia, and tarsus of leg I: 2-2 + 1

solenidion -4-5 + 3 eupathidia + 1 solenidion ; leg II, femur, genu, tibia, and tarsus : 2-2-4-7 + 1 solenidion ; leg III, femur, genu, tibia, and tarsus : 1-1-2-6 ; leg IV, femur, genu, tibia, and tarsus : 1-0-3-5. Claws and empodium as figured. Body 519  $\mu$  long, 319  $\mu$  wide.



FIGS. 21-25 : *Neocheyletiella vestergaardi*, new species. Female.  
21) Dorsal and ventral view of idiosoma ; 22) Right leg I ; 23) Right leg II ; 24) Right leg III ; 25) Right leg IV

*Male* (Figs. 26-30). — Gnathosoma with distal part cone shaped and proximal part truncate. Rostrum semicircular anteriorly, distally with 1 dorsal pair of simple setae, ventral surface with 1 medial pair of simple setae, located above cheliceral base, with 1 proximal pair of simple setae, adjacent to palpal trochanter. Palpi short and strongly robust ; palpal femur with 1 dorsal simple seta, ventrally with 2 simples setae ; genu with 1 dorsal simple seta and 1 ventral simple seta ; tibia with 1 dorsal simple seta, ventrally with 1 simple seta, 1 small solenidion and 2 small sickle-like. Claws curved downward. Peritreme composed of 5 pairs of segments.



FIGS. 26-30 : *Neocheyletiella vestergaardi*, sp. n. Male. 26) Dorsal and ventral view of idiosoma ;  
27) Left leg I ; 28) Left leg II ; 29) Left leg III ; 30) Left leg IV.

*Dorsum*. — Idiosoma oval. Propodosoma wider than long, with a conspicuous shield, posterior part clearly defined, submerged beneath cuticle striae. Shield as figured, with 1 pair of simple setae. First 3 pairs of lateral propodosomal setae unequal in length to 1st pair, 2nd and 3rd pairs 3 × longer than 1st pairs, with 2 pairs of simple setae below shield, these subequal in length to pair on shield. Hysterosoma with genital shield, flanked by 2 pairs of lateral simple setae, with 1 short medial pair of simple setae, 2 longer lateral pairs of simple, about 3 × longer than medial pair of simple setae, distally with 1 pair dorsal and 1 pair ventral simple setae, subequal in length to 2 lateral pairs of simple setae.

*Venter*. — Propodosoma and hysterosoma as figured. Epimera I separated from each other. Coxal setal formula : 3-1-1-1. Setation on femur, genu, tibia, and tarsus of leg I : 3-1 + 1 solenidion -1 + 1 solenidion -6 + 4 eupathidia ; leg II, femur, genu, tibia, and tarsus : 2-2-4-8 + 1

solenidion ; leg III, femur, genu, tibia, and tarsus : 1-1-2-6 + 1 solenidion ; leg IV, femur, genu, tibia, and tarsus : 1-0-3-6. Claws and empodia as figured. Body 293  $\mu$  long, 186  $\mu$  wide.

*Holotype*. — Female, U.S. National Museum of Natural History, No. 3708, collected from *Erythrura prasina* (Sparrman) a caged-bird ; Copenhagen, Denmark, 10 February 1975, by Klaus Vestergaard.

*Allotype*. — Male with the above data.

*Paratypes*. — Five females, 1 male, 1 larva, and 1 female nymph with the above data.

This species is named in honor of Dr. Klaus Vestergaard, Department of Zoology, Royal Veterinary and Agricultural University, Copenhagen, Denmark.

3. Genus *Bakerichelyla* Volgin, 1966 : 227.

Type-species : *Cheyletiella chanayi* Berlese and Trouessart, 1889 : 135.

4. Genus *Ornithochelyla* Lawrence, 1959 : 416.

Type-species : *Ornithochelyla megaphallos* Lawrence, 1959 : 416.

For key to species of this genus see Smiley (1970).

#### SUBFAMILY CRIOKERONTINAE, NEW SUBFAMILY

*Type-genus*. — *Criokeron* Volgin, 1966 : 219.

*Diagnosis*. — Gnathosoma large and modified, with strong claws ventrally. Palpi large or minute. Peritreme composed of 10-30 pairs of segments, varying in shape and size. Dorsum with 2 distinct shields, with a platelet on each side of propodosomal shield bearing single seta. Coxae I with spurs, leg I-IV with small tarsal claws and empodium. Found on lemurs and mongooses.

Males are not known.

1. Genus *Criokeron* Volgin, 1966 : 219.

Type-species : *Nihelia quinta*, Domrow and Baker, 1963 : 230.

For key to the females of *Criokeron* see Smiley (1970).

#### SUBFAMILY NIHELIINAE, NEW SUBFAMILY

*Type-Genus*. — *Nihelia* Domrow and Baker, 1960 : 194.

*Diagnosis*. — Gnathosoma with strong retrorse spur above peritreme in male. Male palpi with 3 pairs of segments : femur, tibia, and tarsus ; female with 4 segments : femur, genu, tibia, and tarsus (trochanterocoxal region indistinct). Basal segment of male palpi with internal, forward directed spur, in addition to retrorse external spine distally, and blunt process dorsobasally. Tibial claw well developed, much stronger in male than in female. Palpal tarsus of both sexes much reduced, nodulelike, and without comb or sicklelike setae, with 3 short simple setae only. Dorsum with 2 subequal shields in both sexes. Male aedeagus projecting dorsoposteriorly. Legs : all tarsi with 2 claws and bifurcate pulvilli. Dorsal setae on legs and palpi plumose. Setae on apical segment simple or rodlike. Found on squirrels.

I. Genus *Nihelia* Domrow and Baker, 1960 : 194.

Type-species : *Nihelia calcarata* Domrow and Baker, 1960 : 194.

For a key to species of *Nihelia* see SMILEY (1970).

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