

## IDIOSOMAL AND LEG CHAETOTAXY IN THE CHEYLETIDAE

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----- ABSTRACT—Idiosomal and leg chaetotaxy (including solenidiotaxy) are studied in Cheyletidae *s. lat.* A system of nomenclature is proposed for the idiosomal chaetotaxy. This system is basically similar to that already used by the author for Ereyneidae and Myobiidae. -----

The chaetotaxy is an important character in the study of mites. Some genera have a characteristic setal pattern and many species are distinguished on chaetotaxy alone. Moreover, the study of chaetotaxy has led to a better understanding of phylogeny and post-embryonic development (Fain, 1963, 1964, 1976).

Several systems of nomenclature have been developed for the idiosomal chaetotaxy in the parasitic Prostigmata (e. g. Ereyneidae, Harpyrhynchidae and Myobiidae). The usefulness of such nomenclature is obvious. It simplifies the descriptions and makes comparative studies between species much easier.

The identification of the idiosomal setae is generally more difficult in Cheyletidae than in Ereyneidae or Myobiidae owing to the frequency of neotrichy in this group. However, neotrichy does not exist in all genera. Moreover, these additional setae are nearly always located in the middle region of the dorsum (the "dorsomedians" of Summers and Price, 1970) and they may be recognized generally without difficulty. The lateral setae ("dorsolaterals" of these authors) are more constant in number and follow generally the same pattern as in the Ereyneidae and the Myobiidae (Fain, 1963).

(1) IDIOSOMAL CHAETOTAXY IN THE FEMALES OF CHEYLETIDAE (Table 1)—In the genera of Cheyletidae where neotrichy is absent, the dorsal and ventral chaetotaxy resembles closely that of Ereyneidae and Myobiidae and the same nomenclature may therefore be utilized.

The author has studied the following 11 genera and 13 species of the families Cheyletidae and Cheyletiellidae: (1) *Cheyletiella* Canestrini, 1886 [*C. parasitivorax* (Megnin, 1878)], (2) *Bicheyletiella* Fain, 1972 [*B. romerolagi* Fain, 1972 (Fig. 2)], (3) *Metacheletoides* Fain, 1972 [*M. numidae* Fain, 1972 (Fig. 1)], (4) *Nihelia* Domrow & Baker, 1960 [*N. curvidens* (Lawrence, 1948) (Fig. 3)], (5) *Cheyletus* Latreille, 1796 [*C. trouessarti* Oudemans, 1902 and *C. rwandae* Fain, 1972 (Fig. 4)], (6) *Samsinakia* Volgin, 1965 (= *Cryptocheyla* Fain, 1972) [*S. volgini* Fain, 1972 (Fig. 5)], (7) *Chelonotus* Berlese, 1893 [*C. selenirhynchus* Berlese, 1893], (8) *Bakericheyla* Volgin, 1966 [*B. chanayi latior* Fain, 1972 (Fig. 7)], (9) *Bakericheyla* (*Apodicheyla*) Fain, 1979 [*B. (A.) africana* Fain, 1979 (Fig. 8)], (10) *Neochyletiella* Baker, 1949 [*N. media* Fain, 1972 (Fig. 9)], and (11) *Ornithocheyletia* Volgin, 1964 [*O. psittaci* Fain, 1972 (Fig. 6)], (12) *Apodicheles* Fain, 1979 [*A. cypsiurus* Fain, 1979 (Fig. 10)].

No significant difference between these two families concerning the disposition or the number of idiosomal or leg setae was found. The chaetotaxy cannot, therefore, be utilized as an argument to separate these families.

In all the species that are studied, the following setae are present: *vi*, *ve*, *sci*, *sc e*, *h*, *l1*, *l2*, *l3*, *l4*, *l5*, *g1*, *g2*, *g3*, *g4*, *g5*, *ic1*, *ic3* and *ic4*. The *h* setae are dorsal in all the genera except in *Samsinakia* Volgin (= *Cryptocheyla* Fain) and *Metacheletoides* Fain where they are ventral.

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TABLE 1.—Idiosomal chaetotaxy and leg solenidiotaxy in female Cheyletidae.

Genera and species studied	d 1	d 2	d 3	d 4	d 5	a 1	a 2	a 3	Leg Solenidiotaxy							
									Coxae				Tarsus		Tibia	
									I	II	III	IV	I	II	I	I
<i>Cheyletiella</i>																
<i>C. parasitivorax</i>	+	+	+	+	+	+	+	+	2	1	2	2	+	+	0	+
<i>Bicheyletiella</i>																
<i>B. romerolagi</i>	+	+	+	+	+	+	+	+	2	1	2	2	+	+	0	+
<i>Metacheletoidea</i>																
<i>M. numidae</i>	+	+	+	0	+	+	+	+	2	1	2	2	+	+	+	+
<i>Nihelia</i>																
<i>N. curvidens</i>	+	+	+	+	+	+	+	+	2	1	2	2	+	+	+	?
<i>Cheyletus</i>																
<i>C. trouessarti</i>	+	+	0	+	+	+	+	+	2	1	2	2	+	+	+	+
<i>C. rwandae</i>	0	0	0	0	+	+	+	+	2	1	2	2	+	+	+	+
<i>Samsinakia</i>																
<i>S. volgini</i>	0	0	0	0	+	+	+	+	2	1	2	2	+	+	+	+
<i>Chelonotus</i>																
<i>C. selenirhynchus</i>	0	0	0	0	+	+	+	+	2	1	2	2	+	+	+	+
<i>Bakericheyla</i>																
<i>B. chanayi latior</i>	+	+	0	0	0	+	+	0	2	1	2	2	+	+	+	+
<i>Bakericheyla (Apodicheyla)</i>																
<i>B. (A.) africana</i>	+	+	0	0	0	+	+	0	2	1	2	2	+	+	+	+
<i>Neochyletiella</i>																
<i>N. media</i>	+	+	+	0	+	0	0	0	2	1	1	1	+	+	+	+
<i>Ornithocheyletia</i>																
<i>O. psittaci</i>	+	0	0	0	0	+	+	+	2	1	2	1	+	+	+	+
<i>Apodicheles</i>																
<i>A. cypsiurus</i>	+	+	0	0	+	0	0	0	2	1	1	1	+	+	0	+

The *d 1-d 5* vary according to the genus and the species (Table 1). The *d 1* and *d 5* are present in most of the genera while *d 2* to *d 4* are frequently absent or reduced and modified. Paradoxically, in the genera where neotrichy is present, the new setae are generally placed in the medium regions of the dorsum where precisely the reduction of the normal chaetotaxy (*d 2-d 4*) is also the most frequent.

The anal setae are rarely absent. They consist of 3 pairs situated close to the anus: *a 1* (or *a i*) is internal and most anterior (when the anus is in ventral position), *a 2* (or *a e*) is also anterior but more external, and *a 3* is most posterior.

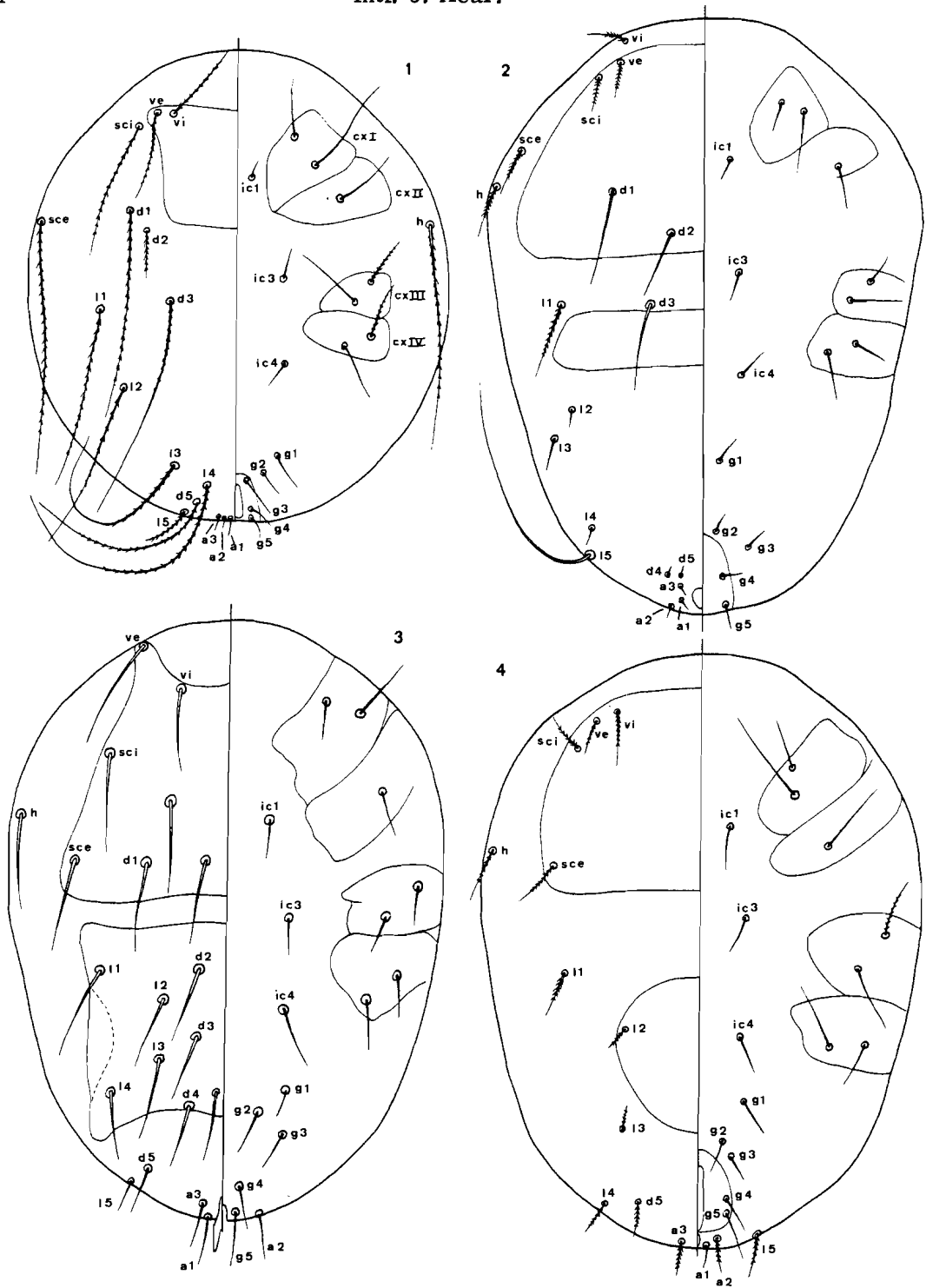
All the species that are listed here have 3 pairs of intercoxal setae: *ic 1* are situated between coxae I; *ic 3* between coxae III or slightly in front; *ic 4* between coxae IV or slightly behind. In some species, however, (e. g. *Neochyletiella avicola* Fain), *ic 4* are lacking.

There are 5 pairs of genital setae. They are constant in all the species. Generally 2 or 3 anterior pairs are situated in front of the vulva, the posterior pairs are on the vulvar lips.

#### Differences in idiosomal chaetotaxy between Cheyletidae and other groups

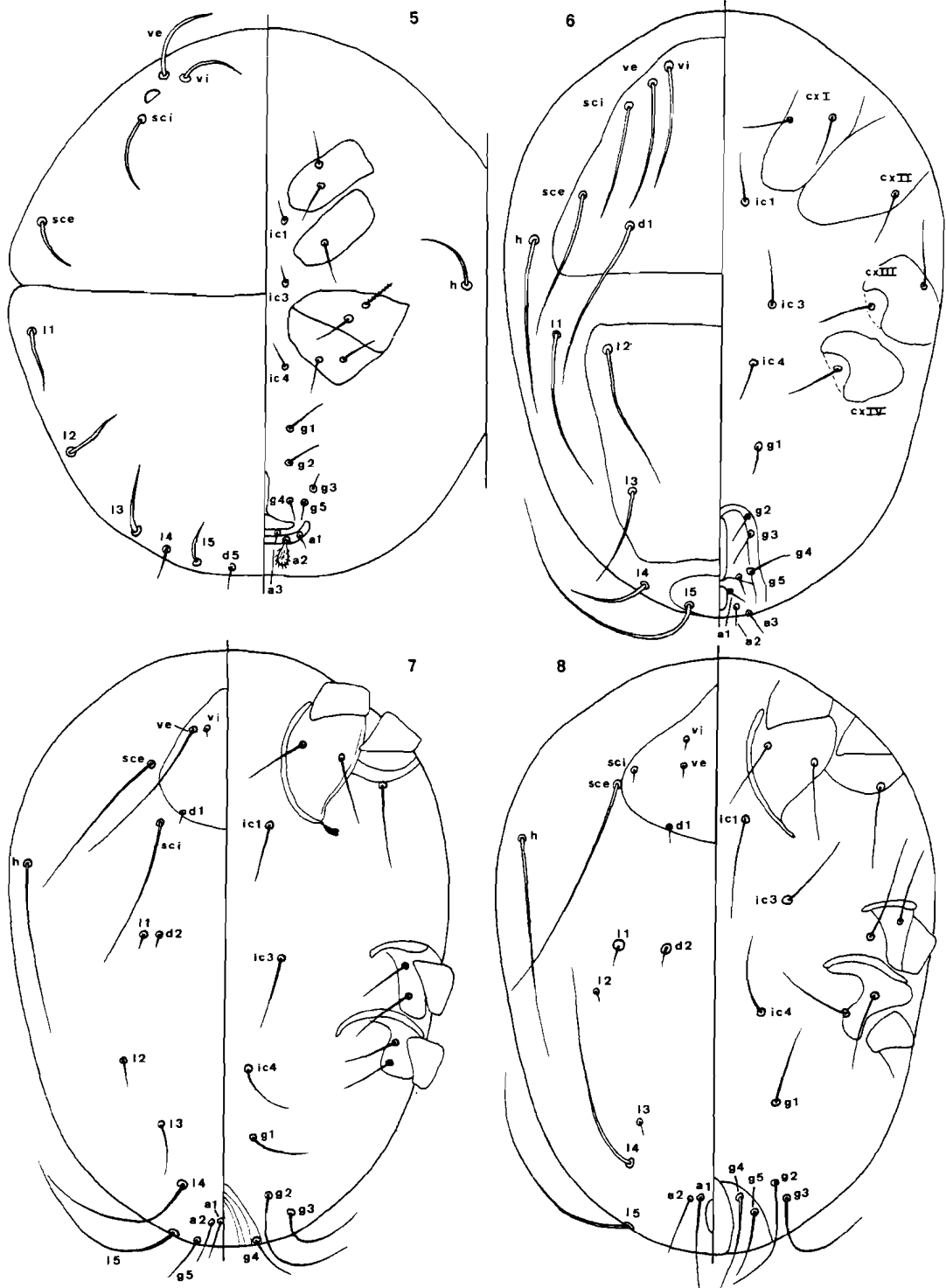
The chaetotaxy in Cheyletidae is basically the same as in the Ereynetidae and the Myobiidae. The differences consist in the followings (Fain, 1963).

1. Setae *h* are always lacking in Ereynetidae and Myobiidae.
2. There are only 2 pairs of anal setae and generally a greater number of genital setae in Ereynetidae and Myobiidae but there is a great variability according to the genera and species.



Figs. 1, 2: Idiosomal chaetotaxy in females—1, *Metacheletoides numidae* Fain, 1972; 2, *Bicheyletiella romerolagi* Fain, 1972. Figs. 3, 4: Idiosomal chaetotaxy in females—3, *Nihelia curvidens* (Lawrence, 1948); 4, *Cheyletus rwandae* Fain, 1972.

3. There are 4 pairs of intercoxal setae (*ic 1-ic 4*) in Myobiidae. In Ereynetidae there are 3 pairs situated as in Cheyletidae.
4. The number of coxal setae is more variable in Ereynetidae and Myobiidae.
5. In Ereynetidae one of the propodonotal setae is modified in a sensilla, and in the most primitive genera seta *l 4* is also a sensilla. No sensillae are present in the Myobiidae and Cheyletidae.



Figs. 5, 6: Idiosomal chaetotaxy in females—5, *Samsinakia volgini* (Fain, 1972); 6, *Ornithocheyletia psittaci* Fain, 1972. Figs. 7, 8: Idiosomal chaetotaxy in females—7, *Bakericheyla* (*B.*) *chanayi latior* Fain, 1972; 8, *Bakericheyla* (*Apodicheyla*) *africana* Fain, 1979.

The chaetotaxy of the idiosoma in 13 species is summarized in Table I. In this table, no mention is made to the setae which are present in all these species (e. g. *vi*, *ve*, *sci*, *sce*, *h*, *l1*, *l2*, *l3*, *l4*, *l5*, *ic1*, *ic3*, *ic4*, *g1*, *g2*, *g3*, *g4*, *g5*). All the genera mentioned in this table are devoid of neotrichy except *Nihelia* which possess 3 pairs of paramedian neotrichial setae on the dorsum.

TABLE 2.— TABLE 2.—Leg chaetotaxy in female Cheyletidae.

Genus and species	Trochanters				Femora				Genua				Tibiae				Tarsi			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
<i>Cheyletiella</i>																				
<i>C. parasitivorax</i>	1	1	2	1	2	2	2	1	2	2	2	2	5	4	4	4	9	7	7	7
<i>Bicheyletiella</i>																				
<i>B. romerolagi</i>	1	1	2	1	2	2	2	1	2	2	2	2	5	4	4	4	9	7	7	7
<i>Metacheletoides</i>																				
<i>M. numidae</i>	1	1	2	1	2	2	1	1	2	2	2	2	4	4	4	4	9	7	7	7
<i>Nihelia</i>																				
<i>N. curvidens</i>	1	1	2	1	2	2	2	1	2	2	2	2	5	4	4	4	7	7	7	7
<i>Cheyletus</i>																				
<i>C. trouessarti</i>	1	1	2	1	2	2	2	1	2	2	2	2	5	4	4	4	9	7	7	7
<i>C. rwandae</i>	1	1	2	1	2	2	2	1	2	2	2	2	5	4	4	4	9	7	7	7
<i>Samsinakia (=Cryptocheyla)</i>																				
<i>S. volgini</i>	1	1	2	1	2	2	1	1	2	2	2	2	4	4	4	4	8	7	7	7
<i>Chelonotus</i>																				
<i>C. selenirhynchus</i>	1	1	2	1	2	2	2	2	2	2	2	2	5	4	4	4	8	7	7	7
<i>Bakericheyla</i>																				
<i>B. chanayi latior</i>	1	1	2	1	2	2	1	1	2	2	2	2	4	4	3	3	9	7	7	7
<i>Bakericheyla (Apodicheyla)</i>																				
<i>B. (A.) africana</i>	1	1	2	1	2	2	1	1	2	2	2	2	4	4	3	3	9	7	7	7
<i>Neochyletiella</i>																				
<i>N. media</i>	1	1	2	1	2	2	1	1	2	2	1	0	4	4	3	3	9	7	7	6
<i>Ornithocheyletia</i>																				
<i>O. psittaci</i>	1	1	0	0	2	2	1	1	2	2	2	1	4	4	3	3	9	7	7	7
<i>Apodicheles</i>																				
<i>A. cypsiurus</i>	1	1	1	0	2	2	0	0	2	2	1	0	4	4	3	3	9	6	6	6

Among all these genera the genus *Apodicheles* (Fig. 10) is the most evolved in the regressive sense. This genus is represented by 2 species parasitic on Swifts (Apodidae).

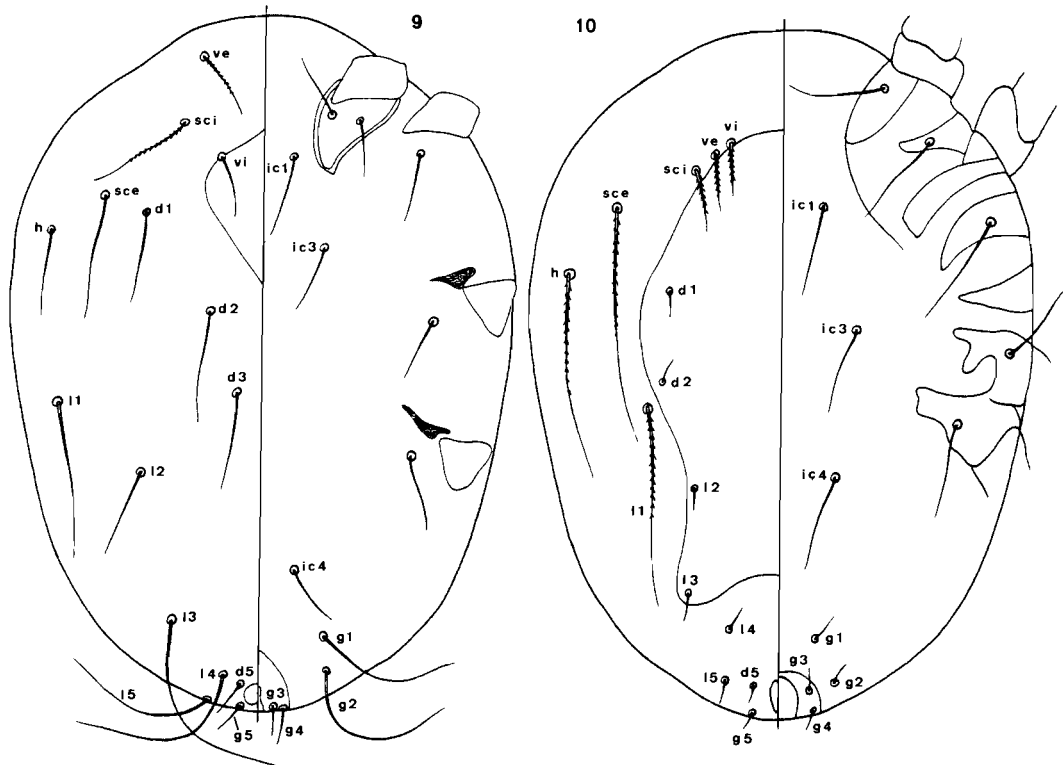
(2) LEG CHAETOTAXY IN THE FEMALES OF CHEYLETIDAE (Table 1 and 2)—The most primitive pattern of leg chaetotaxy is encountered in the genera *Cheyletus* (free living), *Cheyletiella* and *Bicheyletiella* (parasitic on mammals). In these genera the following setae are present: Trochanters 1-1-2-1, femora 2-2-2-1, genua 2-2-2-2, tibiae 5-4-4-4 and tarsi 9-7-7-7. In all the other genera one or several setae are lacking.

It is to be noted that all the species of the same genus have not necessarily the same number of setae on all the leg segments. In the genus *Neochyletiella*, e. g., one can distinguish three groups of species according to the number of setae (2 or 3) on tibiae III or IV.

COXAL SETAE—Coxa I always bears 2 setae and coxa II always 1 seta. Both coxae III and IV bear either 1 or 2 setae. The 2 possible formulae, therefore, are, 2-1-1-1 (genera *Neochyletiella*, ~~*Cheyletiella*~~ and *Apodicheles*) or 2-1-2-2 (8 other genera).  
 $\frac{1, 2-1-2-1}{(Ornithocheyletia)}$

(3) LEG SOLENIDIOTAXY IN THE FEMALES OF CHEYLETIDAE (Table 1)—In all the genera that I have studied, the tarsi I and II bear one solenidion. The solenidion is always dorsal on tarsus I. That of tarsus II is generally smaller than that of tarsus I and is situated either ventrally or ventrolaterally (in *Nihelia*, *Chelonotus*, *Samsinakia*, *Cheyletus*, *Cheyletiella*, *Bicheyletiella*), or more rarely dorsally (*Bakericheyla (Apodicheyla)* and *Ornithocheyletia*), or dorsolaterally (*Bakericheyla s. s.*, *Neochyletiella*, *Apodicheles* and *Metacheletoides*).

Tibia I in all the species bears a dorsal or dorsolateral solenidion except in *Cheyletiella*, *Bicheyletiella* and *Apodicheles* species where this solenidion is lacking.



Figs. 9,10: Idiosomal chaetotaxy in females—9, *Neocheyletiella media* Fain, 1972; 10, *Apodicheles cypsiurus* Fain, 1979.

The genu I always bears a small and short solenidion (sometimes very small) except in *Nihelia* where it is apparently replaced by a short barbed seta.

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