

## OBSERVATIONS ON THE LEG CHAETOTAXY OF THE FAMILY SPINTURNICIDAE (ACARINA : MESOSTIGMATA)

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SPINTURNICIDAE  
CHAETOTAXY  
LEGS

SUMMARY : The leg chaetotaxy of 32 species of the family Spinturnicidae (Acari : Mesostigmata) was studied. The genus *Spinturnix* has the lowest degree of specialization. *Paraspinturnix globosus* has a *Spinturnix*-like chaetotaxy which suggest a close taxonomic relationship. The genera *Ancystropus* and *Meristaspis* form a very evolved, closely related, complex of species, as inferred from their chaetotactic features. The genera *Periglischrus*, *Cameronieta* and *Eyndhovenia* display some affinities, but these taxa showed a smaller linkage than that observed between *Meristaspis* and *Ancystropus*.

SPINTURNICIDAE  
CHAETOTAXIE  
PATTES

RÉSUMÉ : Les données chaetotaxiques des pattes chez 32 espèces de la famille Spinturnicidae (Acari : Mesostigmata) sont étudiées. Le genre *Spinturnix* a la chaetotaxie la moins spécialisée. *Paraspinturnix globusus* a une formule chaetotaxique très proche de celle de *Spinturnix*, ce qui suggère une parenté taxonomique. Les genres *Ancystropus* et *Meristaspis* forment un complexe d'espèces très évoluées et très proches l'une de l'autre, selon leurs données chaetotaxiques. Les genres *Periglischrus*, *Cameronieta* et *Eyndhovenia* présentent quelques affinités, bien que cette union paraît moins étroite que celle observée entre les genres *Ancystropus* et *Meristaspis*.

### INTRODUCTION

The seven legs segments in Gamasina have a well defined chaetotaxy, of taxonomic value. In the last years, new systems of terminology for the chaetotaxy of idiosoma and legs have been introduced, such as those of EVANS (1963) and others.

Mites of the family Spinturnicidae Oudemans, 1902, are exclusively parasites of Chiroptera. RUDNICK (1960) in a major contribution to the taxo-

nomy of this family has referred to some of their adaptations, including chaetotactic transformations, and EVANS (1968) has conducted a study of the morphology of the postembryonic developmental stages of *Spinturnix myoti*.

No detailed study appears to have been made on the leg chaetotaxy of the family as a whole, although reference has been made to chaetotactic modifications in the parasitic members of related groups in the Dermanyssoidae (EVANS and TILL,

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1965; SOLOMON, 1974). In the present paper, the results of a study of leg chaetotaxy in several species of the family Spinturnicidae are given.

## MATERIAL AND METHODS

The species included in this work are : *Spinturnix bakeri*, *S. queenslandicus*, *S. nepalensis*, *S. paracuminatus*, *S. acuminatus*, *S. americanus*, *S. andegavinus*, *S. nudatus*, *S. kolenatii*, *S. wilssoni*, *S. chiengmai*, *S. verutus*, *S. psi*, *S. plecotinus*, *S. mystacinus*, *S. emarginatus*, *Paraspinturnix globosus*, *Ancystropus palawanensis*, *A. rudnicki*, *A. zeloborii*, *A. aethiopicus*, *Meristaspis dusbabeki*, *M. mindanaoensis*, *M. calcaratus*, *M. jordani*, *Eyndhovenia euryalis*, *Periglischrus iheringi*, *P. caligus*, *P. ojastii*, *P. cubanus*, *Cameronieta thomasi* and *C. strandtmanni*. *S. myoti* was not considered because of the exhaustive morphological data reported in the paper of EVANS (1968). Both male and female and female were studied using the chaetotactic formulae of EVANS (1963).

With the exception of the specimens belonging to *S. plecotinus*, *S. psi*, *S. mystacinus*, *S. emarginatus*, *S. andegavinus* and *E. euryalis*, which have been taken from the author's collection, all the others species have been kindly provided by several people and Institutions. A comparative study of the ontogenetic development of the chaetotactic patterns was not performed because of the poor condition of the majority of the proto- and deutonymphal specimens; these data are only available for a few species and are not included here.

## RESULT

All the studied species belonging to the genus *Spinturnix* (Tables 1, 2, 3 and 4) have the same setal pattern on coxa IV and genua III-IV; the remaining leg segments differ in some setal features within these species. Thus, coxa IV carries one ventral seta, genu III has 8 setae and genu IV has 7 setae. In this way, the chaetotaxy of genu III has lost one antero-ventral seta, and genu IV show hypotrichy in antero-lateral and postero-lateral portions, with

hypertrichy in postero-ventral setae, when compared with free-living members of the Superfamily.

In the other segments, coxa I has three ventral setae in *S. chiengmai*, whereas all the other 15 species carry two setae (normal complement for this segment). Coxa II shows various degrees of hypotrichy (*S. queenlandicus*, *S. nepalensis*, *S. acuminatus*, *S. paracuminatus*, *S. verutus*, *S. psi* and *S. chiengmai*), hypertrichy (only *S. wilsoni*) or the normal complement of two setae. On coxa III, in all the species but one (*S. chiengmai*, with only one seta) the setal complement of two is retained.

TABLE 1. — Chaetotactic formulae (in columns) for legs I and II, in several species of *Spinturnix*. Left column shows the leg segment : C : coxa ; T : Trochanter ; F : Femur ; G : Genu ; Ti : Tibia. Other abbreviations as follows : A : anterior ; D : dorsal ; V : ventral ; P : posterior. Thus, IGPD will reflect the number of setae in the postero-dorsal position of genu I.

TABLE 2. — Chaetotactic data from legs III and IV in several species of genus *Spinturnix*.

1 : *S. queenslandicus*. 2 : *S. nepalensis*. 3 : *S. bakeri*. 4 : *S. paracuminatus*.  
5 : *S. acuminatus*. 6 : *S. americanus*. 7 : *S. daubentonii*. 8 : *S. nudatus*.

	1	2	3	4	5	6	7	8
IIIC	2	2	2	2	2	2	2	2
IIIT	4	3	4	4	5	5	4	5
IIIFA	1	1	1	1	1	1	1	
IIIFD	4	3	3	3	3	3	3	
IIIFV	1	2	2	2	2	2	2	
IIIFP	0	0	1	1	0	0	0	0
IIIGA	1	1	1	1	1	1	1	
IIIGAD	2	2	2	2	2	2	2	
IIIGAV	1	1	1	1	1	1	1	
IIIGPD	2	2	2	2	2	2	2	
IIIGPV	1	1	1	1	1	1	1	
IIIGP	1	1	1	1	1	1	1	
IIITiA	1	1	1	1	1	1	1	
IIITiAD	1	1	1	1	1	1	1	
IIITiAV	1	1	1	1	1	1	1	
IIITiPD	2	2	2	2	2	2	2	
IIITiPV	1	1	1	1	1	1	1	
IIITiP	1	1	1	1	1	1	1	
IVC	1	1	1	1	1	1	1	
IVT	5	3	5	5	5	4	4	
IVFA	0	1	1	1	1	1	1	
IVFD	4	3	3	3	3	3	3	
IVFV	2	1	2	2	2	2	2	
IVFP	0	0	0	0	0	0	0	
IVGA	1	1	1	1	1	1	1	
IVGAD	2	2	2	2	2	2	2	
IVGAV	1	1	1	1	1	1	1	
IVGPD	2	2	2	2	2	2	2	
IVGPV	1	1	1	1	1	1	1	
IVGP	1	1	1	1	1	1	1	
IVTiA	1	1	1	1	1	1	1	
IVTiAD	1	1	1	1	1	1	1	
IVTiAV	1	1	1	1	1	1	1	
IVTiPD	2	2	2	2	2	2	2	
IVTiPV	1	1	1	1	1	1	1	
IVTiP	1	1	1	1	1	1	1	

In trochanters I-IV, the chaetotactic features of free-living Dermanyssoidae appear in *S. andegavinus*, *S. emarginatus*, *S. mystacinus*, *S. nudatus*, *S. plecotinus*, *S. verutus* and *S. psi*. The hypotrichy for this segment is obvious in *S. chiengmai* (3-3-5-5), *S. acuminatus* and *S. paracuminatus* (4-4-5-5), *S. nepalensis* (4-4-3-3) or *S. kolenatii* (4-5-3-4).

In femur I, the basic dermanyssine chaetotactic pattern is retained only in *S. nepalensis*, *S. wilsoni* and *S. americanus*. Deviations from these features are shown in *S. verutus*, *S. plecotinus* and *S. psi* (a rotation of seta pl2 has been observed), or in *S. queenslandicus*, *S. acuminatus*, *S. paracuminatus* and *S. chiengmai* (antero-lateral and postero-lateral hypotrichy).

Femur II displays considerable degree of hypo-

TABLE 3. — Chaetotactic data from legs I and II in several species of genus *Spinturnix*.

1 : *S. kolenatii*. 2 : *S. wilsoni*. 3 : *S. chiengmai*. 4 : *S. verutus*.  
5 : *S. plecotinus*. 6 : *S. psi*. 7 : *S. mustacinus*. 8 : *S. emarginatus*.  
9 : *P. globosus*

	1	2	3	4	5	6	7	8	9
IC	2	2	2	2	2	2	2	2	2
IT	4	5	5	5	5	3	5	5	3
IFA	2	2	2	2	2	1	2	2	1
IFD	3	4	5	5	5	4	4	4	3
IFV	3	3	3	2	2	3	3	3	4
IFP	2	2	1	1	1	1	1	1	1
IGA	2	2	2	2	2	1	2	2	2
IGAD	2	2	2	2	2	2	2	2	2
IGAV	1	1	1	1	1	1	1	1	1
IGPD	2	2	2	2	2	2	2	2	2
IGPV	1	1	1	1	1	1	1	1	1
IGP	1	1	1	1	1	1	1	1	1
ITIA	1	2	2	2	2	1	2	2	2
ITIAD	2	2	2	2	2	2	2	2	2
ITIAV	2	1	1	1	1	1	1	1	1
ITIPD	2	2	2	2	2	2	2	2	2
ITIPV	1	1	1	1	1	1	1	1	1
ITIP	1	1	1	1	1	1	1	1	1
IIC	2	4	2	1	1	1	2	2	1
IIT	6	5	5	5	5	3	5	5	3
IIIFA	1	1	1	1	1	1	1	1	1
IIIFD	4	4	4	5	5	4	4	4	2
IIIPV	3	1	2	1	1	3	3	3	2
IIIFP	1	3	2	2	2	2	1	1	0
IIIGA	1	1	1	1	1	1	1	1	1
IIIGAD	2	2	2	2	2	2	2	2	2
IIIGAV	1	0	1	1	1	1	1	1	1
IIIGPD	2	2	2	2	2	2	2	2	2
IIIGPV	1	1	1	1	1	1	1	1	1
IIIGP	1	2	1	1	1	1	1	1	1
IIITiA	1	1	2	1	1	1	1	1	2
IIITiAD	1	2	1	1	1	1	1	1	2
IIITiAV	1	0	1	1	1	1	1	1	1
IIITiPD	2	2	2	2	2	2	2	2	1
IIITiPV	1	0	1	1	1	1	1	1	1
IIITiP	1	2	1	1	1	1	1	1	1

trichy. All of the studied species lack one antero-lateral seta, one dorsal seta (not in *S. verutus* nor *S. psi*), one (*S. plecotinus*) or two (*S. wilsoni*, *S. verutus*, and *S. psi*) ventral setae, or one postero-lateral seta (all but *S. plecotinus*, *S. verutus*, *S. psi* and *S. chiengmai*). Femora III and IV show the normal setal complement in 8 species, plus one species (*S. wilsoni*) which lacks a ventral seta on femur III, and another one (*S. nepalensis*) with hypotrichy of the venter of femur IV. The remaining species show some diversification in setal features, varying from dorsal hypertrichy (*S. queenslandicus* and *S. chiengmai*) to hypotrichy; *S. verutus* and *S. psi* lack setae on both ventral and postero-lateral surfaces.

In genu I, the hypotrichy is apparent only in the

TABLE 4. — Chaetotactic data from legs III and IV in several species of genus *Spinturnix*.

1 : *S. kolenatii*. 2 : *S. wilsoni*. 3 : *S. chiengmai*. 4 : *S. verutus*.  
 5 : *S. plecotinus*. 6 : *S. psi*. 7 : *S. mustacinus*. 8 : *S. emarginatus*.  
 9 : *P. globosus*

antero-lateral position (*S. queenslandicus*, *S. acuminatus*, *S. paracuminatus* and *S. chiengmai*). All of the other species display the normal setal complement (2-1/2-1/1-2). Hypotrich is very evident in genu II : all of the studied species lack an antero-ventral seta and *S. wilsoni* has no antero-ventral setae.

Thirteen species display a normal chaetotactic complement for tibia I; the remainder are hypotrichous for the antero-lateral portion (one seta lost). All but one *Spinturnix* species (*S. plecotinus*) exhibit hypotrichy on antero-lateral portion of tibia II; *S. nepalensis* and *S. wilsoni* do not have setae on the antero-ventral region. All the *Spinturnix* species but two (*S. verutus* and *S. psi*) display hypotrichy of tibiae III and IV; the exceptions show a typical

setal rotation from antero-lateral to an antero-dorsal localization. However, only *S. kolenatii* shows hypotrichy on the postero-lateral area of tibia IV, lacking one seta.

*Paraspinturnix globosus* shows a very remarkable chaetotactic pattern (Tables 3 and 4). The normal complement occurs on coxae I and III, femur III, genu I and tibia I; all of the remaining leg segments display hypotrich, which mainly occurs on the antero-lateral and postero-lateral faces of the segment. In tibia II, a translation of pd2 seta to an antero-lateral position, seems to have occurred.

In the genus *Meristaspis* (Tables 5 and 6), only coxa I and femur III have the normal setal pattern, when compared with the free-living dermanyssoid

TABLE 5. — Chaetotactic formulae for legs I and II, in the genera *Ancystropus* and *Meristaspis*.

1 : *A. palamanensis*. 2 : *A. rudnicki*. 3 : *A. zeleborii*. 4 : *A. aethiopicus*.  
 5 : *A. dusbabeki*. 6 : *A. mindanaoensis*. 7 : *M. calcaratus*. 8 : *M. jordani*.

TABLE 6. — Chaetotactic formulae for legs III and IV, in the genera *Ancystropus* and *Meristaspis*.

1 : *A. palamanensis*. 2 : *A. rudnicki*. 3 : *A. zeleborii*. 4 : *A. aethiopicus*.  
5 : *A. dusbabeki*. 6 : *A. mindanaoensis*. 7 : *M. calcaratus*. 8 : *M. jordani*.

	1	2	3	4	5	6	7	8
IIIC	1	1	1	1	1	1	1	1
IIIT	5	4	5	5	3	6	5	5
IIIFA	1	1	1	1	1	1	1	1
IIIFD	3	3	3	3	3	3	3	3
IIIFV	1	1	1	1	2	2	2	2
IIIFP	0	0	0	0	0	0	0	0
IIIGA	1	1	1	1	1	1	1	1
IIIGAD	1	1	1	1	1	2	2	2
IIIGAV	1	1	1	1	2	1	1	1
IIIGPD	1	1	1	1	0	2	2	2
IIIGPV	1	1	1	1	1	1	1	1
IIIGP	1	1	1	1	1	1	1	1
IIITiA	1	1	1	1	1	1	1	1
IIITiAD	0	0	0	0	1	1	1	2
IIITiAV	0	1	1	1	2	1	1	1
IIITiPD	1	1	1	1	0	2	2	2
IIITiPV	1	1	1	1	1	1	1	1
IIITiP	0	0	0	0	0	0	0	1
IVC	1	1	1	1	1	0	1	1
IVT	4	5	4	5	3	5	5	5
IVFA	1	1	1	1	1	1	1	1
IVFD	3	4	3	4	3	3	3	3
IVFV	1	1	1	1	1	2	2	2
IVFP	0	0	0	0	0	0	0	0
IVGA	1	1	1	1	1	1	1	1
IVGAD	1	1	1	1	2	2	2	2
IVGAV	1	1	1	1	1	1	1	1
IVGPD	1	1	1	1	2	2	2	2
IVGPV	1	1	1	1	1	1	1	1
IVGP	1	1	1	1	1	1	1	1
IVTiA	1	1	1	1	1	1	1	1
IVTiAD	0	0	0	0	1	1	1	2
IVTiAV	1	1	1	1	1	1	1	1
IVTiPD	1	1	1	1	2	2	2	2
IVTiPV	1	1	1	1	0	1	1	1
IVTiP	0	0	0	0	1	0	0	1

type. Trochanter I displays hypotrichy in both *M. mindanaoensis* and *M. dusbabeki* as well as genu and tibia I in all the five *Meristaspis* species ; tibia I shows the complete chaetotactic features only for *M. calcaratus*, whereas this segment is hypotrichous for the remaining species included in the genus. Coxa II carries two setae in *M. dusbabeki*, *M. lateralis* and *M. jordani*, but is hypotrichous for the other species ; this condition is also present on trochanter II of *M. lateralis* and *M. dusbabeki*.

Femur II has always a reduced number of setae, showing a very broad range of setal combinaisons. The same observation is true for genu and tibia III, but, in the latter, a rotation of setae pd2 occurs for *M. calcaratus*. Similar events of rotation are

seen on genu III (seta pd1, *M. dusbabeki* and *M. lateralis*), tibia III (seta ad1, *M. jordani*). Some species have the typical dermanyssoid setal complement on coxa and trochanter III (*M. jordani*, *M. calcaratus*), coxa IV (all but *M. mindanaoensis*), trochanter IV (all but *M. mindanaoensis* and *M. dusbabeki*) and femur IV (*M. mindanaoensis*, *M. jordani* and *M. calcaratus*). Genu and tibia IV are always hypotrichous.

The genus *Ancystropus* has a *Meristaspis*-like chaetotatic pattern (Tables 5 and 6). Only coxae I and IV and trochanters I-IV retain the primitive setal complements. The remaining segments are hypotrichous, and this characteristic is more marked than in *Meristaspis* species. Thus, only 6 setae are present on genua III-IV and tibia II, and 4-5 setae may be observed on tibiae III-IV. The relationship between these two genera is evident from the data obtained.

The genera *Periglischrus*, *Eyndhovenia* and *Cameronieta* display a lower degree of hypotrichy (Table 7 and 8), when compared with *Spinturnix* and *Meristaspis-Ancystropus* patterns. In general, the setal distribution of the free-living members of the Superfamily is present on all of the leg segments of the three genera, with the exception of femur II and genu IV, which are hypotrichous in the seven studied species. Hypertrichy occurs in both *Cameronieta thomasi* and *C. strandtmanni* on genu and tibia II. Other setal modifications, such as rotation, can be seen on tibia I-II (*P. ojastii* and *caligus*) or femur I (*E. eryialis*). As in the other studied genera, coxae and trochanters nearly always have the chaetotactic features of the free-living Dermanyssoid type. From the results obtained it appears evident that a chaetotactic linkage exists between these three genera, with *E. eryialis* presenting an intermediate chaetotactic pattern between the other two genera.

#### DISCUSSION

Mites of the family Spinturnicidae exhibit marked morphological and biological adaptations for life in the chiropteran hosts, for example, the form of the idiosoma and ambulatory appendages (RUDNICK, 1960) and the body and leg chaetotaxy (EVANS,

TABLE 7.— Chaetotactic data from legs I and II in the genera *Periglischrus*, *Cameronieta* and *Eyndhovenia*.

1 : *E. euryalis*. 2 : *P. iheringi*. 3 : *P. caligus*. 4 : *P. ojastii*. 5 : *P. cubanus*. 6 : *thomasi*. 7 : *C. strandmanni*.

	1	2	3	4	5	6	7
IC	2	2	2	2	1	2	2
IT	5	3	5	5	5	5	5
IFA	2	1	1	1	1	1	2
IFD	5	4	4	4	4	4	4
IFV	2	3	3	4	4	3	3
IFP	2	2	2	1	2	2	2
IGA	2	2	1	1	1	2	2
IGAD	2	2	2	2	2	3	3
IGAV	1	1	1	1	0	1	1
IGPD	2	2	2	2	2	2	2
IGPV	1	1	1	2	1	1	1
IGP	1	1	1	1	1	1	2
ITiA	2	2	2	1	1	2	2
ITiAD	2	2	3	3	2	3	3
ITiAV	1	1	1	2	1	1	1
ITiPD	2	2	2	2	2	2	2
ITiPV	1	1	1	1	1	1	1
ITiP	1	1	0	1	1	1	2
IIC	2	2	2	2	2	2	2
IIT	5	6	5	6	5	6	6
IIFA	2	1	2	2	1	1	1
IIFD	4	4	4	3	4	4	4
IIFPV	2	2	3	3	3	3	4
IIFP	1	2	1	1	1	1	1
IIGA	1	1	1	2	1	2	2
IIGAD	2	2	2	2	2	2	2
IIGAV	1	1	1	1	1	1	1
IIGPD	2	2	2	2	2	2	2
IIGPV	1	1	1	1	1	1	1
IIGP	1	1	1	1	1	1	1
IITiA	1	1	2	2	1	2	2
IITiAD	1	2	1	1	2	1	1
IITiAV	1	1	1	1	1	1	1
IITiPD	2	2	2	2	2	2	2
IITiPV	1	1	1	1	1	1	1
IITiP	1	1	0	1	1	0	0
IVC	1	1	1	1	1	1	1
IVT	4	4	5	5	4	5	5
IVFA	1	0	1	1	0	0	1
IVFD	3	3	3	3	3	3	3
IVFV	2	2	2	2	2	2	2
IVFP	0	1	0	0	1	0	0
IVGA	1	0	2	2	0	2	2
IVGAD	2	2	2	2	2	2	2
IVGAV	1	1	1	1	1	1	1
IVGPD	2	2	2	2	2	2	2
IVGPV	1	1	1	1	1	1	1
IVGP	1	1	1	2	2	1	1
IVTiA	1	2	2	2	1	2	2
IVTiAD	1	1	1	1	1	1	1
IVTiAV	1	1	1	1	1	1	1
IVTiPD	2	2	2	2	1	2	2
IVTiPV	1	1	1	1	1	1	1
IVTiP	1	1	1	1	1	2	1

TABLE 8.— Chaetotactic features from legs III and IV in the genera *Periglischrus*, *Cameronieta* and *Eyndhovenia*.

1 : *E. euryalis*. 2 : *P. iheringi*. 3 : *P. caligus*. 4 : *P. ojastii*. 5 : *P. cubanus*. 6 : *thomasi*. 7 : *C. strandmanni*.

	1	2	3	4	5	6	7
IIIC	2	2	2	2	1	2	2
IIIT	5	4	5	5	4	5	5
IIIFA	2	1	0	1	1	0	1
IIIFD	3	3	3	3	2	3	3
IIIFV	2	2	2	2	2	3	2
IIIFP	0	1	0	0	0	0	0
IIIGA	1	2	2	2	2	2	2
IIIGAD	2	2	2	2	2	2	2
IIIGAV	1	1	1	1	1	1	1
IIIGPD	2	2	2	2	2	2	2
IIIGPV	1	1	1	1	1	1	1
IIITiA	1	2	2	2	2	2	2
IIITiAD	1	1	1	1	1	1	1
IIITiAV	1	1	1	1	1	1	1
IIITiPD	2	2	2	2	2	2	2
IIITiPV	1	1	1	1	1	1	1
IIITiP	1	1	0	1	0	0	0
IVC	1	1	1	1	1	1	1
IVT	4	4	5	5	4	5	5
IVFA	1	0	1	1	0	0	1
IVFD	3	3	3	3	3	3	3
IVFV	2	2	2	2	2	2	2
IVFP	0	1	0	0	1	0	0
IVGA	1	0	2	2	0	2	2
IVGAD	2	2	2	2	2	2	2
IVGAV	1	1	1	1	1	1	1
IVGPD	2	2	2	2	2	2	2
IVGPV	1	1	1	1	1	1	1
IVGP	1	1	1	2	2	1	1
IVTiA	1	2	2	2	1	2	2
IVTiAD	1	1	1	1	1	1	1
IVTiAV	1	1	1	1	1	1	1
IVTiPD	2	2	2	2	2	2	2
IVTiPV	1	1	1	1	1	1	1
IVTiP	1	1	1	2	1	1	1

1968). This family, as in other parasitic members of the Dermanyssidae, displays a remarkable modification of the chaetotaxy of the idiosoma and appendages, when compared with the condition in the free-living members of the Superfamily (EVANS and TILL, 1965).

The genus *Spinturnix* shows a broad range of hypotrichy, varying from the localized neoteny of *S. bakeri*, *S. americanus*, *S. nudatus*, *S. andegavinus*, *S. emarginatus* and *S. pleconitus*, to the high degree of hypotrichy of *S. queenslandicus*, *S. nepalensis*, *S. acuminatus*, *S. paracuminatus* and *S. chiengmai*. The femur and genu I may have the normal chaetotactic pattern in several species; this fact is evident for *S. americanus*, and, in a lower degree, for *S. bakeri*.

From the obtained data, there are definite signs of chaetotactic linkage between several species. The *S. myoti* complex of species (*S. mystacinus*, *S. emarginatus* and *S. andegavinus*) studied in this paper shows a high degree of connection, and its chaetotactic formulae is very close to that of *S. myoti* (EVANS, 1968). In the same way, *S. psi*, *S. verutus*, and *S. pleconitus* form a complex of species, although the last mentioned species displays a less specialized chaetotaxy. The linkage between *S. psi* and *S. verutus*, can also be observed in their most common host (*Miniopterus schreibersi* Natterer). Finally, *S. bakeri* and *S. americanus* are two closely related species.

*Paraspinturnix globosus* has a *Spinturnix*-like pattern in its chaetotaxy, but a more evident

hypotrichy is present in some leg segments; all *P. globus* resembles a very specialized *Spinturnix* species. As RUDNICK (1960) stated, it is closest to *Spinturnix* in most of its characters, but has an *Ancystropus*-type peritreme.

The genera *Acytropus* and *Meristaspis* appear to be a very evolved, closely related, complex of species, as inferred from their leg chaetotaxy. This specialization can be observed also on legs I and their ambulacra, which appear to be specially modified for attachment to the eyelids and eye canthi of their hosts. The proximity between these two genera is well documented in the literature. HIRST (1923) placed *Meristaspis* as a subgenus of *Ancystropus*. RADFORD (1942, 1947) and STILES and NOLAN (1931) recognized HIRST's treatment of the genus. Other authors, including RADFORD (1950) and RUDNICK (1960) have given to *Meristaspis* generic status. *Ancystropus* appears to be the more evolved genus, since hypotrichy is more evident at some leg segments, mainly the femora, genua and tibia II-IV.

Some affinities have been noted between the genera *Periglischrus*, *Cameronieta*, and *Eyndhovenia*. Although these taxa have shown a smaller linkage than that displayed by *Ancystropus-Meristaspis* complex of species, a certain similarity can be observed from their chaetotactic formulae. The affinity is mainly due to the presence of a normal setal complement on genua and tibiae III-IV in most species, a condition not observed for the remaining species studied. As DUSBÁBEK (1967) stated, *Cameronieta* and *Periglischrus* differ specially in the shape of the body, shape of the sternal plate of female, in the presence of a spiny area on the venter and in the situation of anal opening. In addition, representatives of the genus *Cameronieta* are solely parasites of bats of the Subfamily Chilonyceterinae with relatively well defined specificity to individual species. In the same way, *Eyndhovenia euryalis* follows a well defined distribution, not overlapped with that of *Periglischrus* and *Cameronieta*, and shows a high degree of specificity to bats of the Family Rhinolophidae. On the other hand, the known species of the genus *Periglischrus* have been reported from New World bats belonging to the Family Phyllostomatidae.

An examination of a greater number of species, as well as the determination of dorsal setal homologies between the members of the Family, are necessary before meaningful conclusions can be drawn on the interspecific and intergeneric relationships within the Spinturnicidae.

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