

The fur mites (Acari : Listrophoridae)  
of the Round-tailed Muskrat,  
*Neofiber alleni*

by A. FAIN<sup>oo</sup>, M. A. SMITH<sup>ooo</sup> and J. O. WHITAKER Jr<sup>ooo</sup>

**Abstract**

Three new species of fur mites of the family Listrophoridae (Acari) are described from the Round-tailed Muskrat *Neofiber alleni*, from Florida, U.S.A. They are *Listrophorus laynei* sp. n., *L. caudatus* sp. n. and *Prolistrophorus birkenholzi* sp. n.

**Résumé**

Trois nouvelles espèces d'acariens pilicoles de la famille Listrophoridae (Acari) sont décrites de *Neofiber alleni*, des U.S.A.: *Listrophorus laynei* sp. n., *L. caudatus* sp. n. et *Prolistrophorus birkenholzi* sp. n.

BIRKENHOLZ (1963) reported that nearly all Round-tailed muskrats, *Neofiber alleni*, he examined were infested with "Listrophoridae, probably an undescribed species." We have now collected additional material from this host and herein describe three new species of Listrophoridae (Acari). Seventeen Round-tailed Muskrats, mostly collected by James N. Layne, were examined for parasites by M.A.S., along with mites from 8 additional muskrats collected earlier by Layne. The muskrats included were collected between 1968 and 1984. Further information on abundance and occurrence on the host will be presented later.

Two of the species belong to the genus *Listrophorus* PAGENSTECHEER, 1861 (*L. laynei* sp. n. and *L. caudatus* sp. n.) and one to the genus *Prolistrophorus* FAIN, 1970 (*P. birkenholzi* sp. n.).

Fur mites of other groups (Myobiidae, Myocoptidae and hypopi of Glycyphagidae) were not regularly found on *Neofiber alleni*. The mite fauna of this rodent appears therefore much poorer than that of the Muskrat, *Ondatra zibethicus*, another species

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<sup>oo</sup> Institut royal des Sciences naturelles de Belgique, rue Vautier, 29, 1040 Bruxelles, Belgium.

<sup>ooo</sup> Indiana State University, Terre haute, Indiana 47809, U.S.A.

similar in biology to *Neofiber alleni*. *Ondatra* in North America is infested by 6 species of the genus *Listrophorus*, one species of *Myocoptes*, one species of *Zibethacarus* and one species of *Radfordia*. In addition, one laelapid mite, *Laelaps multispinosa*, parasitizes the Muskrat, and one, *L. evansi*, parasitizes the Round-tailed Muskrat.

All the measurements utilized herein are in micrometers ( $\mu\text{m}$ ).

The holotypes of the new species are deposited in the US National Museum, Washington, D.C. Paratypes are in the collection of the authors.

## FAMILY LISTROPHORIDAE

Genus *Listrophorus* PAGENSTECHER, 1861

The genus *Listrophorus* is cosmopolitan. Eleven species are known from the New World, and all were described from North American rodents except one (*L. mexicanus* FAIN, 1970) which was described from a Mexican rodent.

*Listrophorus* derives from *Prolistrophorus* FAIN, 1970; it is more evolved (= more regressed) than the latter. In *Listrophorus* the median part of the postscapular shield has completely disappeared so that there are two dorso-lateral shields completely separated in the midline. In *Prolistrophorus* there is only one large postscapular shield but the median part contains an oval non punctate and finely striated area.

We have shown that there is good correlation between regression in the parasite and the degree of evolution of the host (FAIN, 1979). Hosts and mites have followed a parallel evolution and the species of the genus *Listrophorus* are as a rule found in more highly evolved hosts than those of the genus *Prolistrophorus*.

The greater frequency of *Prolistrophorus* in South America, compared with North America, and the reverse for *Listrophorus*, can be explained by the fact that the Neotropical rodents generally tend to be more primitive than their Nearctic relatives.

### 1. *Listrophorus laynei* sp. n.

This species is named for Dr James N. LAYNE, who collected a part of our material.

Female (figs 1; 6): Holotype 432 long and 135 wide (maximum width of the idiosoma). Length and width of 4 paratypes in lateral view: 460 x 136; 445 x 135; 440 x 138; 430 x 130. Length of prescapular shield in midline 96. Length of postscapular shield along its dorsal margin 78; maximum width 60; this shield bears 15-16 dark transverse lines (counted along dorsal margin). Lateral region of body between coxae III and IV with partly scaled thick striations. Opisthosoma 110 long, densely covered with triangular scales, those of ventral surface distinctly longer than those of lateral or dorsal surfaces. A small finely striated area devoid of scales is present behind setae *l* 3. The opening of the bursa is situated close to the anus, dorsal to the dorsal anal sclerite; the bursa is 78 long. Legs relatively long; leg IV (from base of femur to tip of tarsus) 83 long. Lengths of solenidia of leg I:  $\omega$  18;  $\omega$  330; *phi* 9; of leg II:  $\omega$  113; *phi* 9. All idiosomal setae are short and thin, the longest setae are the *l* 5 and *gp* (25 long).

Male (figs 2-3; 12): Four paratypes measure (length x width): 395 x 124; 390 123; 370 x

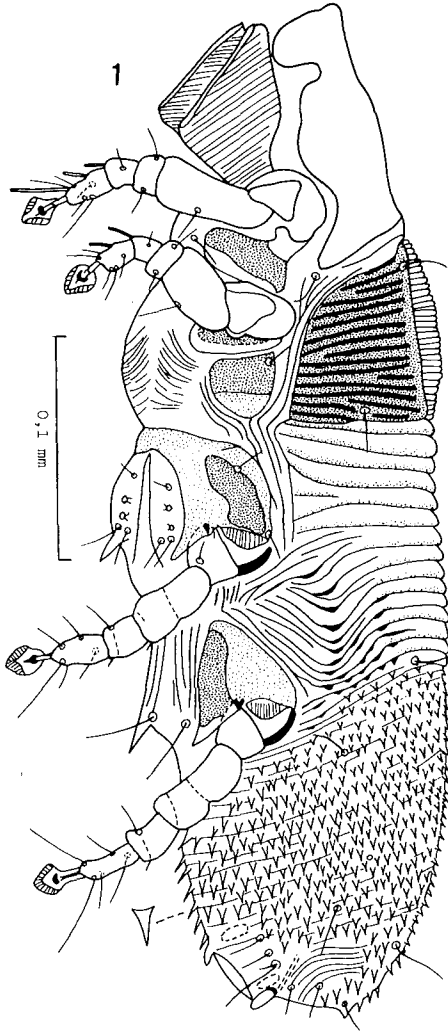
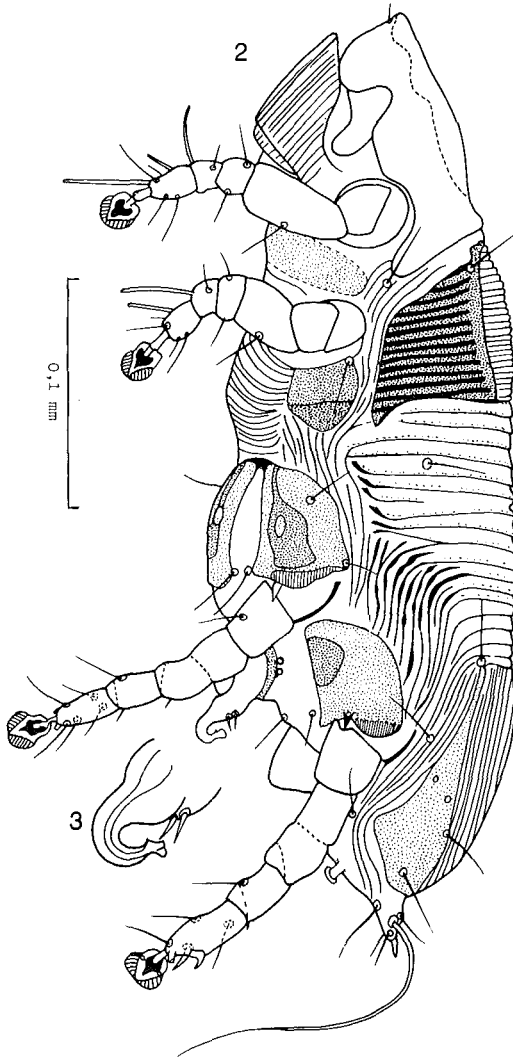


Fig. 1. *Listrophorus laynei* sp. n. Female in lateral view.

106; 360 x 115. Posterior extremity with two well-formed lobes, each of them slightly notched posteriorly. Lateral surfaces of body with thick striations more or less scaly. Length of prescapular shield 94-96, of postscapular shield (along dorsal margin) 65-72; maximum width of postcapular shield 54-60, this shield bearing 13 to 15 dark lines.



Figs 2-3. *Listrophorus laynei* sp. n. Male in lateral view (2); penis (3).

Opisthosomal shields very narrow in their anterior part, they are 80-100 long and bear the setae *d* 2; maximum width of these shields in their posterior third (33 wide). in one male the opisthosomal shields are incomplete anteriorly and do not reach the setae *d* 2. Penis short, strongly curved (at 135°); its base bears one pair of setae (*gm*). Epimera IV not fused

in midline. There is a pair of small adanal suckers. The posterior lobes bear four pairs of setae, the longest are the *l 5* (120 long).

#### *Host and locality*

Holotype female from *Neofiber alleni*, from SW shore of Lake Istokpoga, Highlands Co., Florida, Lake Placid, USA (Mas 35, February 1969).

Paratypes: 17 females and 35 males from the same host and locality but taken on other dates: MAS 31, 8 Feb. 1969 (3 females); MAS 32 and 33, 26 August 1968 (2 females and 4 males); MAS 34, 35, 41-48, 42-18, 43-18, 44-16, 45-15, all on 5 Feb. 1984 (10 females and 27 males); MAS 47-15, 48-7 and 48-20 on 6 Feb. 1984 (4 females and 4 males).

#### *Remarks*

This new species is very close to *L. kingstownensis* FAIN and HYLAND, 1973, described from the Muskrat *Ondatra zibethicus*, in Rhode Island, U.S.A.

We have compared our specimens with the holotype and 5 paratypes (3 females and 2 females) of *L. kingstownensis*, and we think that they belong to a new species which differs from the latter by the following characters:

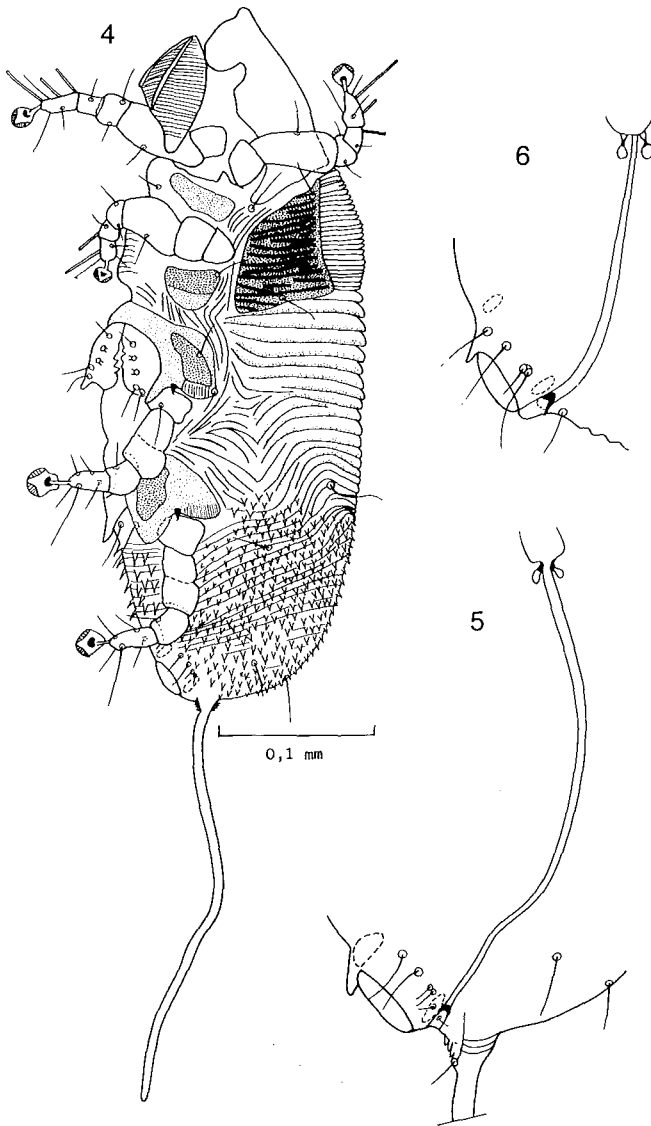
In the female: postscapular shields relatively narrower (54 to 59 wide and 75 to 80 long while in *L. kingstownensis* the width is 65 to 69, the length 75 to 81); opisthosoma shorter (105 to 125, average 110 and 135 to 150 in *L. kingstownensis*).

In the male: postscapular shields relatively narrower (54 to 60 wide and 65 to 72 long) than in *L. kongstownensis* (width 64 to 69, length 69 to 72); transverse dark bands more numerous (13-15) than in *L. kingstownensis* (11 to 14); penis curved at 135° (160° in *L. kingstownensis*); posterior lobes ending in two distinct conical and unequal processes (only one process in *L. kingstownensis*).

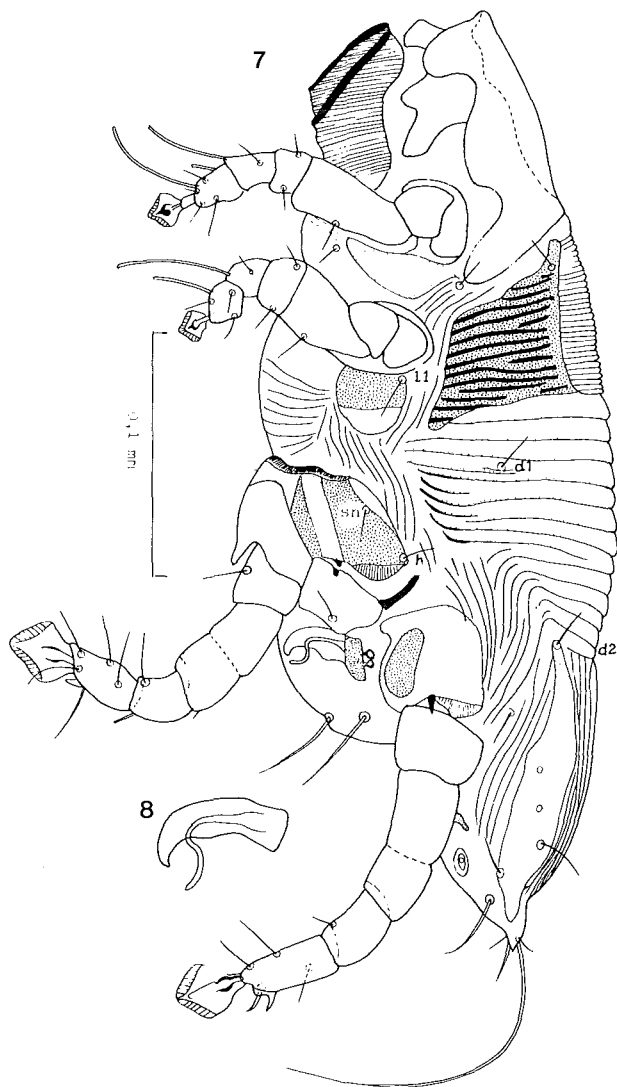
### 2. *Listrophorus caudatus* sp. n.

Female (figs 4-5): Holotype 420 long and 153 wide in lateral view (maximum width). The body is prolonged by a sclerotized cylindrical tail-like process 240 long and 4-6 wide. Length and width of 4 paratypes in lateral view 445 x 160 (tail 239); 405 x 141 (tail 237); 400 x 152 (tail 250); 390 x 143 (tail 235). This tail does not contain the bursa. Length of prescapular shield 87, of postscapular shield 68 (along their dorsal border). Maximum width of postscapular shield 60, this shield bears 14 dark transverse lines (counted along dorsal margin). Lateral surfaces of body with thickened striations. Opisthosoma covered with triangular scales slightly larger on ventral and lateral surfaces than on dorsal surface. Dorsally these scales do not reach setae *d 2*. All the idiosomal setae are short and very thin. Anus ventro-terminal. Opening of bursa between the dorsal sclerite of anus and the base of the tail. The bursa is 125 long. Length of solenidia: on leg I  $\omega$  3 35 (30 to 45 in 3 paratypes), *phi* 12; on leg II  $\omega$  1 17, *phi* 13-15.

Male (figs 7-8; 13): Length and width (in lateral view and including posterior lobes) 387 x



Figs 4-6. Figs 4-5 : *Listrophorus caudatus* sp. n. Female in lateral view (4); anus and bursa (5).  
 Fig. 6 *Listrophorus laynei* sp. n. Female : anus and bursa.



Figs 7-8. *Listrophorus caudatus* sp. n. Male in lateral view (7); penis (8).

150; 381 x 145; 375 x 140. Length of prescapular shield 82; of postscapular shield 63 (58 to 64 in paratypes). Maximum width of postscapular shield 63 to 66, this shield bears 13-14 dark lines. The striations of lateral parts of hysteronotum thick. Posterior part of hysteronotum with a pair of lateral shields 105 long and 19 maximum wide. Epimeres IV

fused in the midline forming an inverted -U figure. Posterior extremity divided into two lobes, each of them being divided into two triangular processes. Adanal suckers relatively small and oval. Penis short and thick and slightly curved, except at the tip which is abruptly attenuated and strongly curved. The posterior lobes bear long (160-180) setae *l5*, shorter (15) *d5* and very short *a3* and *d4*. The *l4* and *ae* are very unequal and close to each other. Leg IV, including femur, 130 long. Leg I bearing  $\omega$  3 and *phi* 45 long; leg II with  $\omega$  1 25 and *phi* 48 long.

#### *Host and locality*

Holotype female from *Neofiber alleni*, SW shore of Lake Istokpoga, Highlands Co., Florida, Lake Placid, U.S.A. (MAS 35, February 1969). Paratypes from the same host and locality but taken on other dates : MAS 31, 8 February 1969 (6 males paratypes); MAS 32 and 33, 26 August 1968 (5 males, 2 females); MAS 34, 5 February 1984 (4 females); MAS 41-15, 41-18, 41-20, 41-24, 41-29, 42-18, 42-20, 42-21, 42-22, 43-15, 43-18, 45-15, 45-18, 45-19, all on 5 February 1984 (22 males and 7 females); MAS 49-17, 49-22, 49-23 (6 February 1984) (3 males).

#### *Remarks*

This species differs from all other known species in the genus by the presence in the female of a long tail-like prolongation.

#### Genus *Prolistophorus* FAIN, 1970

The genus *Prolistophorus* has been divided into three subgenera on the basis of the characters of the males (FAIN, 1980). The new species that we describe herein belongs to subgenus *Aprolistophorus* FAIN, 1980.

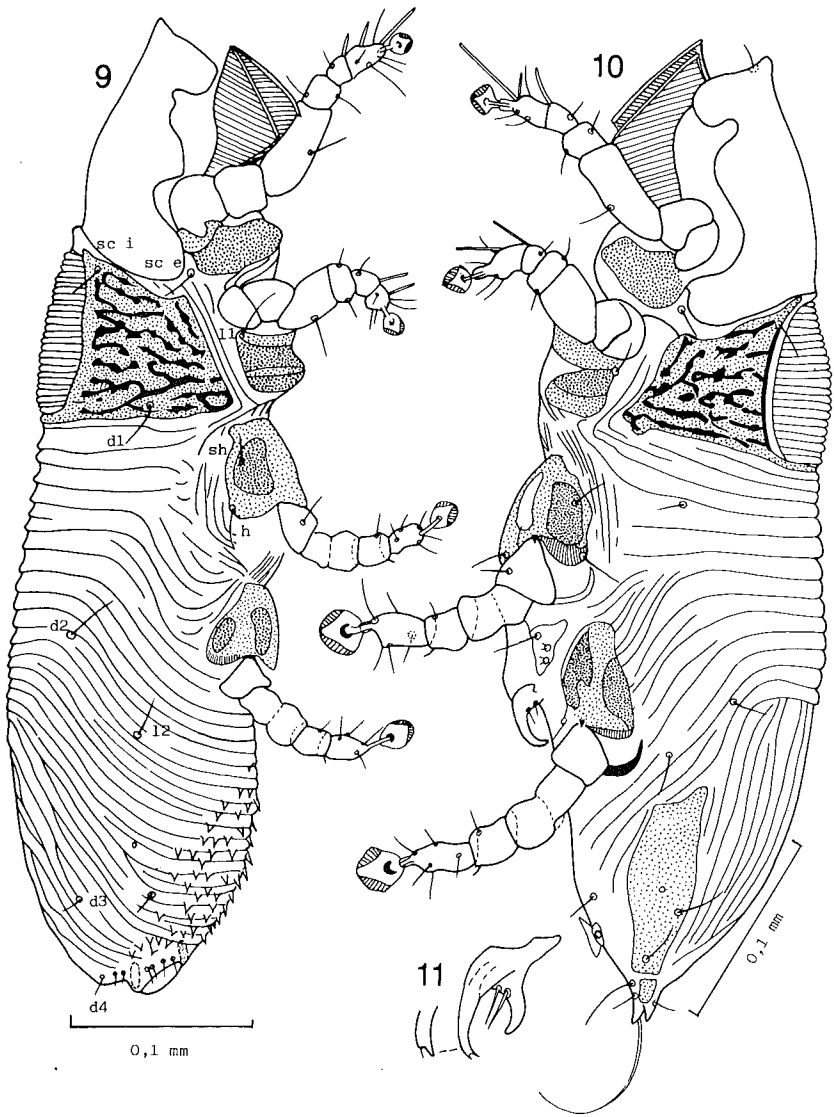
The genus *Prolistophorus* is confined to the New World and it is more frequent in primitive Neotropical mammals, mainly in rodents, than in the generally more evolved Nearctic rodents. Most of the species (18) were found on rodents of the primitive group Hesperomyiinae, especially well represented in South America. Other groups, such as the Echimyidae and the Ctenomyidae, are also infested, by one species each. One species has been described from *Mus musculus brevirostris* from Surinam, and 6 species from the marsupial *Lestoros inca*.

#### *Prolistophorus (Aprolistophorus) birkenholzi* sp. n.

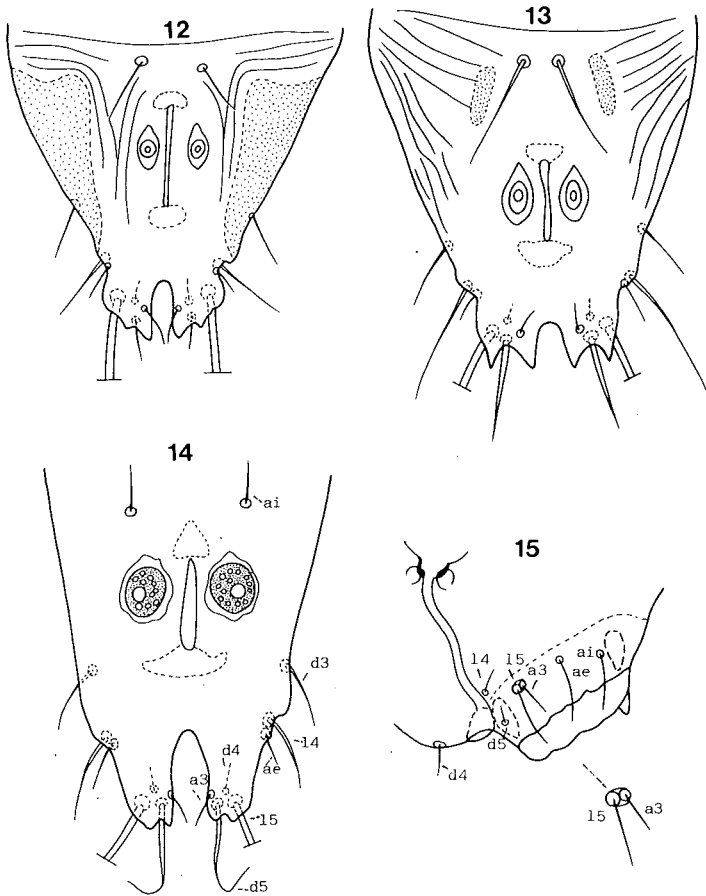
This species is named for Dr Dale E. BIRKENHOLZ, who was the first (in 1963) to mention listrophorid mites on *Neofiber alleni*.

Female (figs 9; 15) : Holotype 549 long and 150 wide (in lateral view); length and width in 3 paratypes : 561 x 159; 540 x 152; 534 x 141. Length of prescapular shield 132, of





Figs 9-11. *Prolistrophorus (Aprolistrophorus) birkenholzi* sp. n. Female (9) and male (10) in lateral view; penis (11).



Figs 12-15. Opisthogaster in the males of *Listrophorus laynei* sp. n. (12), *L. caudatus* sp. n. (13) and *Prolistrophorus birkenholzi* sp. n. (14). Anus and bursa in *Prolistrophorus birkenholzi* sp. n. (female) (15).

postscapular shield 90 (along the margin of the sclerotized part of the shield). The two postscapular shields are separated anteriorly; posteriorly they are joined by a narrow sclerotized strip, these shields bear 7 to 8 irregular and sinuous dark bands thickened at some places (moniliform aspect). Opisthosoma bearing a few triangular scales confined mostly to opisthogaster. All idiosomal setae are short and thin. Anus ventro-terminal. Bursa opening immediately behind (dorsally) the anus in a well-developed conical depression. Posterior legs relatively short, leg IV 80 long (from base of femur to tip of tarsus). Length of solenidia of leg I:  $\omega$  3 30,  $\phi$  8; of leg II:  $\omega$  1 12,  $\phi$  11.

Male (figs 10; 11, 14) : Length and width (in lateral view) in 3 paratypes : 492 x 151; 474 x 143; 468 x 144. Length of prescapular shield 129; of postscapular shield 79. Maximum width of postscapular shield 84, this shield bears 6-8 dark bands as in female. Posterior part of hysterosoma with one pair of lateral shields 96 long and 32 wide. The anterior extremity of these shields is situated about 35-40 from the setae *d* 2. Adanal suckers well developed (diameter 10). Penis short, slightly curved, with a bifid apex. Posterior extremity ending in two lobes 15 long and with apex slightly notched, they bear long *l* 5 setae (120), shorter *d* 5 (30); setae *a* 3 and *d* 4 short. Setae *l* 4 and *ae* unequal and situated close to each other. Posterior legs long, leg IV (including femur) 100 long. Length of solenidia of leg I:  $\omega$  3 33,  $\phi$  18; of leg II:  $\omega$  1 20,  $\phi$  21.

#### *Host and locality*

Holotype female from *Neofiber alleni*, 4.5 miles NW Lake Placid, W shore of Lake Istokpoga, Highlands Co., Florida. MAS 43-18; 5 February 1984. Paratypes from the same host and locality, from the following dates : MAS 31; 8 February 1969 (1 female); MAS 33, 26 August 1968 (1 female); MAS 34, 41-18, 41-24, 42-18, 43-18, 46-24, all on 5 February 1984 (8 females and 12 males); MAS 47-18 and 49-18 on 6 February 1984 (1 female and 2 males).

#### *Remarks*

This species differs from the other species of the subgenus *Aprolistrophorus* mainly by the shape of the soft area situated in the median part of the postscapular shield. This area is very large and completely open anteriorly. In all the other species this area is closed anteriorly. Other characters are the moniliform aspect of the dark transverse bands of the postscapular shields and in the male the small size of the opisthosomal shields.

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