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Notes on the fur mites of the genus *Geomylichus* FAIN, 1970 (Acari Astigmata Listrophoridae), with description of a new species from Mexico

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Abstract

A new species of fur mite *Geomylichus (Ageomylichus) oaxacae* sp.n. (Acari Listrophoridae) is described from a rat *Heteromys desmarestianus* from Mexico. Keys are provided to the subgenera of the genus *Geomylichus* FAIN, 1970 and to the species of the subgenus *Ageomylichus* FAIN, 1981.

Keywords : Acari, Listrophoridae, fur mites, parasitic, rodents, Mexico, *Geomylichus, Heteromys.*

Résumé

Une nouvelle espèce d'acarien pilicole, *Geomylichus (Ageomylicus) oaxacae* sp.n. (Acari Listrophoridae) est décrite d'un rat *Heteromys desmarestianus* de Mexico. Des clés sont données pour les sous-genres du genre *Geomylichus* FAIN, 1970 ainsi que pour les espèces du sous-genre *Ageomylichus* FAIN, 1981

Introduction

With the addition of the new species described here, the genus *Geomylichus* FAIN, 1970 includes 29 species, all living attached to the hairs of American rodents. This genus is distributed in the U.S.A., Mexico, Costa Rica and Colombia.

Four subgenera have been recognized in the genus *Geomylichus* :

Geomylichus (Geomylichus) FAIN, 1970. The type species is *Listrophorus dipodomius* RADFORD, 1953. This subgenus includes at present 20 species, all living on Heteromyidae except 1 which lives on a Geomyidae. These species are confined to the U.S.A. and Mexico.

G. (Neogeomylichus) FAIN & WHITAKER, 1987. This subgenus is only represented by the type species *Geomylichus postscutatus* FAIN (1976) living on a Heteromyidae from the U.S.A. and Mexico.

G. (Whitakerobius) FAIN, 1981. Type species *Listrophorus floridanus* RADFORD, 1949, from species

Geomys tuza, from Florida, U.S.A. There is a second species *G. (W.) deserti* FAIN & WHITAKER, 1987, from *Dipodomys deserti*, from Nevada, U.S.A.

G. (Ageomylichus) FAIN, 1981. Type species *Geomylichus nectomys* FAIN *et al.*, 1978. This subgenus includes 5 other species among which 3 have been described from Sigmodontinae (Muridae) each of them from another country (U.S.A., Mexico and Colombia), the 4th represented only by a tritonymph was found on a hare in Mexico and the 5th is a new species described herein.

Among the 28 species described from the adult stages, 12 are endemic for the U.S.A., 10 are endemic for Mexico, 6 are represented in both countries, 1 is endemic for Costa Rica and 1 for Colombia. The new species that we describe here *G. (A.) oaxacae* sp.n., was collected by the

junior author from a *Heteromys desmarestianus* from the Oaxaca State, in Southern Mexico.

Recently, VARGAS *et al.* (1999) reviewed the literature dealing with the parasitism of Mexican rodents by the mites of the genus *Geomylichus* and they described 4 new species. Three other species of this genus had been described previously from Mexico (HOFFMANN & SERVIN, 1990; SERVIN *et al.*, 1992 and 1994).

All our measurements are in micrometers.

For the signatures of the idiosomal setae, we are using here the system developed by FAIN, in 1963.

We follow here the systematics of the rodents proposed by Don E. WILSON and DeeAnn M. REEDER (1993).

Key to the subgenera of the genus *Geomylichus* (Females)

1. Striated membranous clasping organs of coxae I and II without teeth or serrations on their free edges 2

   Striated membranous clasping organs of coxae I and II, with teeth or serrations on their free edges 3

2 Hysteronotum with a punctate median shield . . . . . *G. (Whitakerobius)* FAIN, 1981

   Hysteronotum without punctate shield . . . . . *G. (Geomylichus)* FAIN 970

3 Hysteronotum with a trilobate median shield in its posterior third. Median area of venter with very thick striations resembling longitudinal folds . . . . . *G.(Neogeomylichus)* FAIN & WHITAKER, 1987

   Hysteronotum without punctate shield. Ventral striations normal, not thickened . . . . . *G. (Ageomylichus)* FAIN, 1981

Key to the species of the subgenus *Ageomylichus* (Females)

Remarks : *Geomylichus sylvilagus* FAIN, 1973, only known from a nymph, is omitted here. *Geomylichus klebergi* MACDANIEL, 1965 is tentatively included in subgenus *Ageomylichus* but is not keyed here.

1. Setae *l5* and *l4* thick, subequal in lengths (200 and 170 long respectively). Total length of body 660 . . *G. (A.) nectomys* FAIN *et al.*, 1978

   Setae *l5* very long and thick, setae *l4* very thin and much shorter (45 to 80 long) 2

2. Total length of body 630 to 660. Postscapular shield with 50-60 transverse striations. Setae *l5* 200-300 long, setae *l4* 70-80 long 3

   Total length of body 540-573, width 140. Postscapular shield with 35-40 transverse striations. Setae *l5* 220 long, *l4* 45-50 long. Copulatory aperture ventral at 40 from posterior extremity. *Cuticular striations* : ventrally, behind the vulvar lips, is a median band, 90 long, with transverse striations reaching the opisthogaster posteriorly; dorsally there are 19-20 transverse median striations between the postscapular shield and the setae *d2*. Between setae *l3* and *d4* all the striations are transverse . . . *G. (A.) oaxacae* FAIN & ESTEBANES sp.n.

3. Setae *sce* 26 long and 7 wide. Opisthosoma 120 long and 90 wide at its base. Copulatory orifice ventral, at 45 from posterior extremity. *Cuticular striations* : ventrally as in *G. (A.) oaxacae* sp.n. but the postgenital band of transverse striations is longer (105) and extends over the opisthogaster. Dorsally : There are about 12 transverse slightly concave striations between the posterior border of postscapular shield and the bases of the setae *d2*; the posterior third of hysteronotum, between setae *d3* and *d4*, bears only longitudinal striations . . . . . *G. (A.) neacomys* FAIN *et al.*, 1978

   Setae *sce* 20 long and 7 wide. Opisthosoma 190 long and 165 wide at its base. Copulatory aperture at 100 from posterior extremity. *Cuticular striations* : ventrally the median area behind the vulvar region with mainly longitudinal striations and a very few (8 to 10) transverse striations. Dorsally with about 20 transverse striations between postscapular shield and setae *d2*; posterior third of hysteronotum, between *d3* and *d4* with only longitudinal striations . . . . . *G. (A.) mexicanus* FAIN, 1976

***Geomylichus (Ageomylichus) mexicanus* FAIN, 1976**

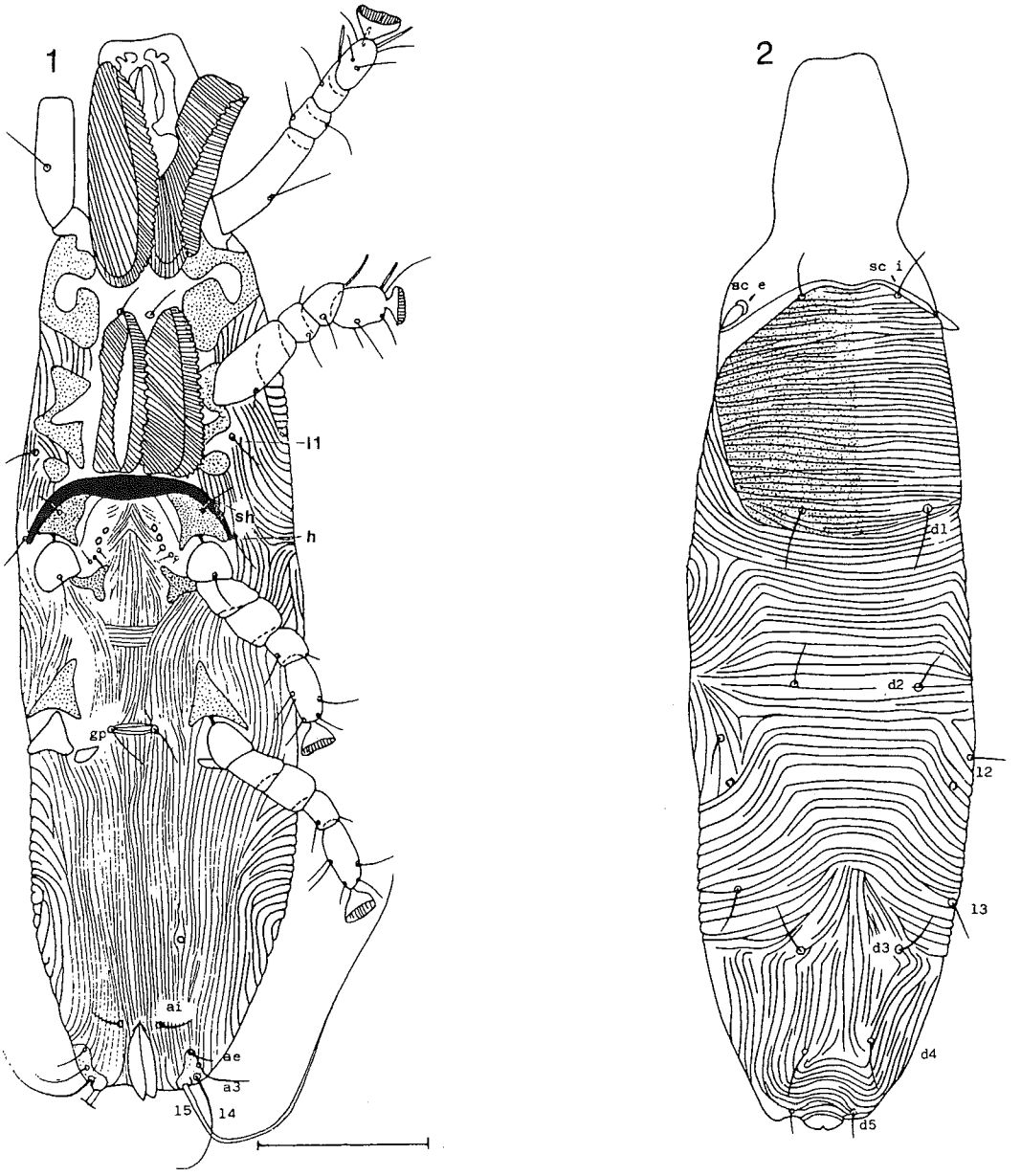
This species had been briefly described, without figures, from a single female collected on *Teanopus phenax*, from Mexico.

Table 1. List of the species of genus *Geomylichus* FAIN, 1970.

Remarks: 1. *Geomylichus (Ageomylichus) sylvilagus* FAIN, 1973, only known from the nymph, is not mentioned here.
2. *Geomylichus klebergi* MCDANIEL, 1965, is tentatively included in the subgenus *Ageomylichus* FAIN, 1981.
3. The symbol * refers to the type species of the subgenus.

Genus and species of the mite	Typical host	Family and subfamily of the host	Locality of the typical host
Subgenus *Geomylichus* Fain, 1970			
* *G. (G.) dipodomius* (Radford, 1953)	*Dipodomys spectabilis*	Heteromyidae, Dipodomyinae	New Mexico, U.S.A.
G. (G.) texanus Fain *et al.*, 1978	*Dipodomys ordii*	„ „	Texas, U.S.A.
G. (G.) utahensis Fain & Whitaker, 1987	*Dipodomys microps*	„ „	Utah, U.S.A.
G. (G.) intercalatus Fain *et al.*, 1991	*Dipodomys compactus*	„ „	Texas, U.S.A.
G. (G.) californicus Fain *et al.*, 1988	*Dipodomys venustus*	„ „	California, U.S.A.
G. (G.) quasinudus Fain *et al.*, 1991	*Dipodomys ingens*	„ „	California, U.S.A.
G. (G.) multistriatus Fain *et al.*, 1988	*Diplodomys nitratoides*	„ „	California, U.S.A.
G. (G.) microdipodops Fain et Whitaker, 1980	*Microdipodops megacephala*	„ „	Nevada, U.S.A.
G. (G.) perognathi Fain & Whitaker, 1980	*Perognathus parvus*	„ Perognathinae	Oregon, U.S.A.
G. (G.) inaequalis Fain *et al.*, 1978	*Chaetodipus hispidus*	„ „	Texas, U.S.A.
G. (G.) hispidus Vargas *et al.*, 1999	*Chaetodipus hispidus zacatecae*	„ „	Mexican Plateau
G. (G.) formosus Fain & Whitaker, 1987	*Chaetodipus formosus*	„ „	Utah, U.S.A.
G. (G.) brevispinosus Fain *et al.*, 1978	*Chaetodipus penicillatus*	„ „	Texas, U.S.A.
G. (G.) penicillatus Vargas *et al.*, 1999	*Chaetodipus penicillatus eremicus*	„ „	Mexican Plateau
G. (G.) nelsoni Vargas *et al.*, 1999	*Chaetodipus nelsoni*	„ „	Mexican Plateau
G. (G.) durangoensis Vargas *et al.*, 1999	*Chaetodipus nelsoni*	„ „	Mexican Plateau
G. (G.) comitanensis Hoffman & Servin, 1990	*Chaetodipus arenarius*	„ „	Baja California Sur Mexico
G. (G.) bassolsae Servin *et al.*, 1992	*Chaetodipus arenarius siccus*	„ „	Baja California Sur Mexico
G. (G.) guaycurensis Servin *et al.*, 1994	*Chaetodipus arenarius sublucidus*	„ „	Baja California Sur Mexico
G. (G.) thomomys Fain *et al.*, 1978	*Thomomys bottae*	Geomyidae	California, U.S.A.
Subgenus *Neogeomylichus* Fain & Whitaker, 1987			
* *G. (N.) postscutatus* Fain, 1976	*Dipodomys (Dipodops)* sp.	Heteromyidae, Dipodomyinae	Nebraska, U.S.A.
Subgenus *Whitakerobius* Fain, 1981			
* *G. (W.) floridanus* (Radford, 1949) (= *G. geomydis* Coffee & McDaniel, 1975)	*Geomys tuza*	Geomyidae	Georgia, U.S.A.
G. (W.) deserti Fain & Whitaker, 1987	*Dipodomys deserti*	Heteromyidae, Dipodomyinae	Nevada, U.S.A.

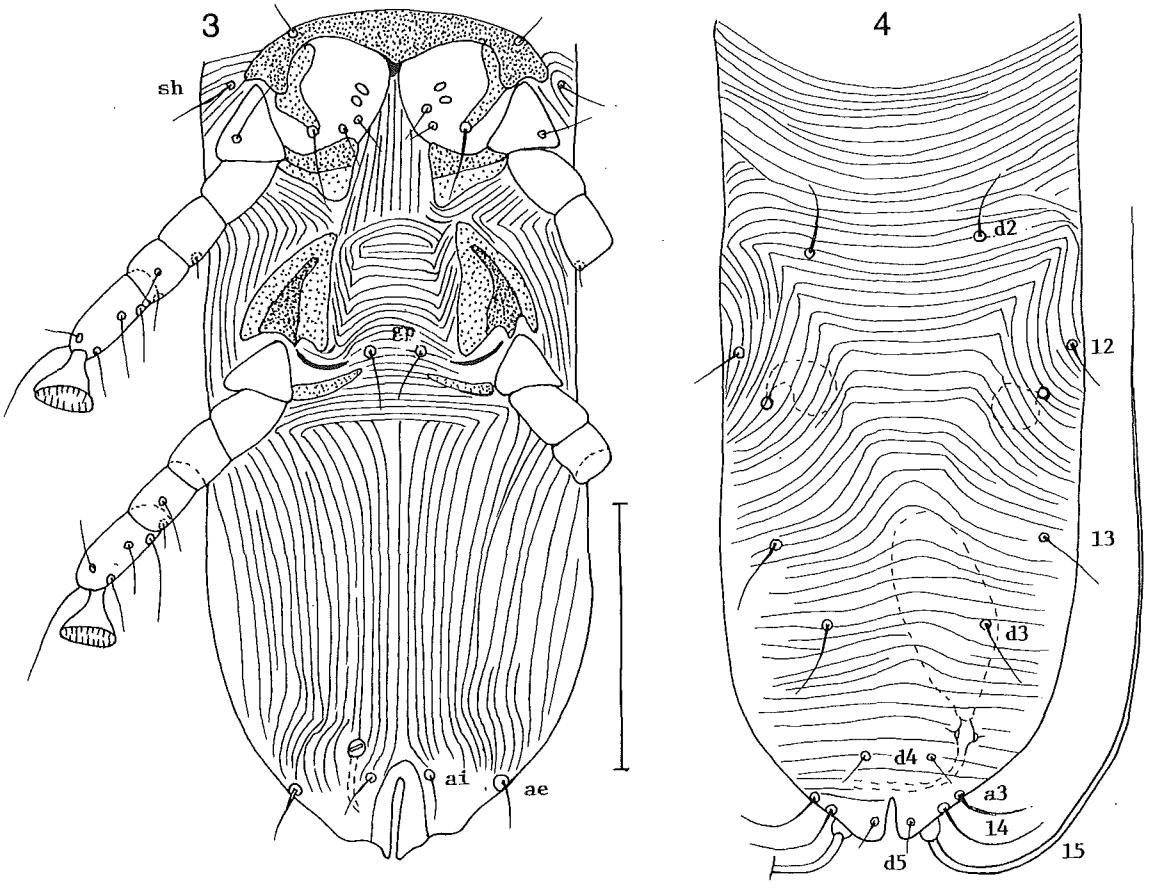
Subgenus *Ageomylichus* fain, 1981			
* *G. (A.) nectomys* Fain *et al.*, 1978	*Nectomys* sp.	Muridae, Sigmodontinae	Costa Rica
G. (A.) neacomys Fain *et al.*, 1978	*Neacomys tenuipes*	„ „	Colombia
G. (A.) mexicanus Fain, 1976	*Neotoma (Teanopus) phenax*	„ „	Mexico
? *G. (A.) klebergi* (McDaniel, 1965)	*Sigmodon hispidus texanus*	„ „	Texas, U.S.A.
***G. (A.) oaxacae* sp. n.**	*Heteromys desmarestianus*	Heteromyidae Heteromyinae	Oaxaca, Mexico



Figs 1-2. *Geomylichus (Ageomylichus) mexicanus* Fain, 1976. Female in ventral (1) and dorsal (2) view. Scale line 100 µm.

In 1981, FAIN created a new subgenus *Geomylichus (Ageomylichus)*, with *G. nectomys* FAIN *et al.*, 1978, as type species.

In 1987, FAIN and WHITAKER included *G. mexicanus* in the subgenus *Ageomylichus*. They completed the description of the species and provided the first figures of *G. (A.) mexicanus*.



Figs 3-4. *Geomylichus (Ageomylichus) oaxacae* sp. n. Female. Hysterosoma in ventral (3) and dorsal (4) view. Scale line 100 µm.

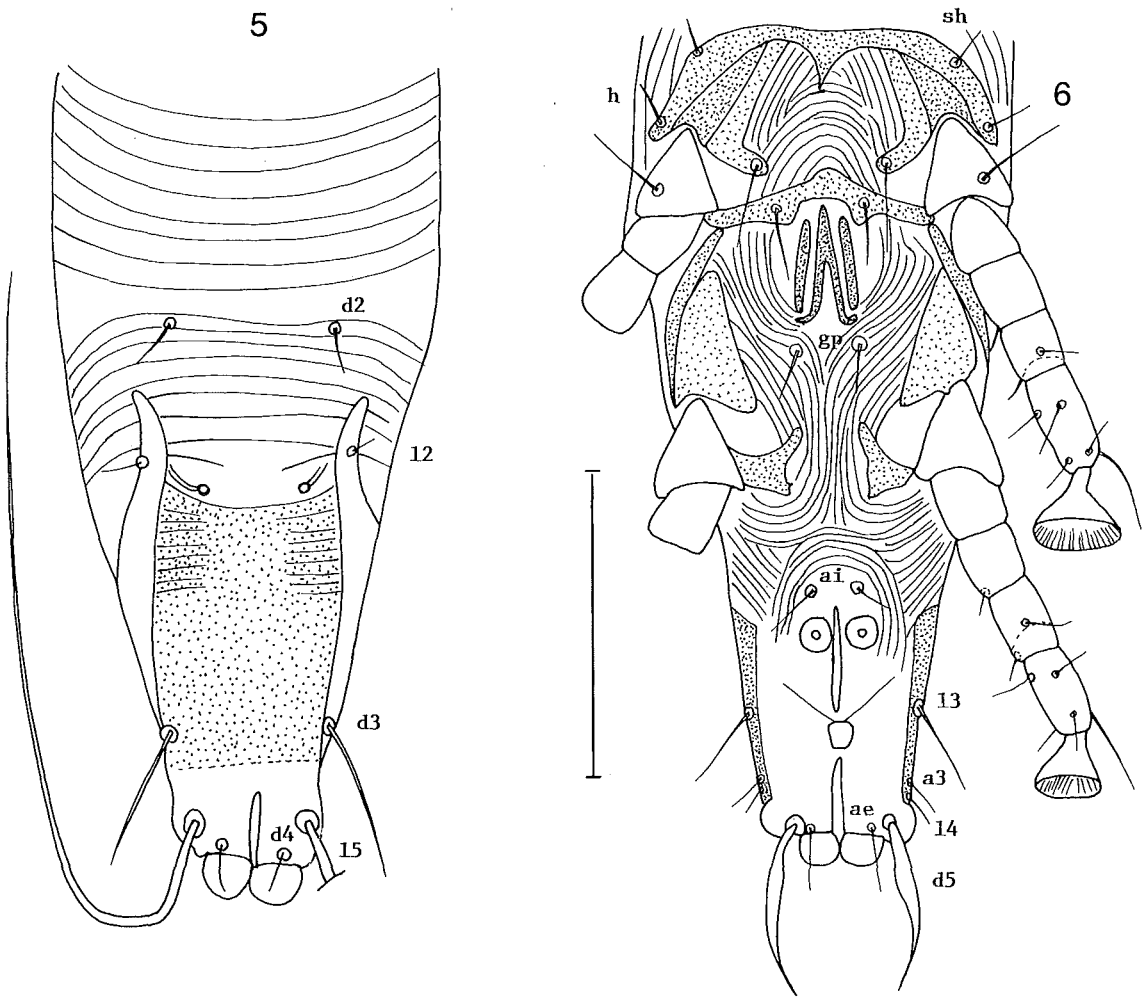
We have reexamined the holotype of this species and give here some additional characters not mentioned previously (Figs 1-2) :

Total length of body 630, maximum width 162. Length of prescapular shield 135, of postscapular shield 153, the latter bearing 60 transverse striations, counted along a line joining setae *sci* and *d1*. Setae *sce* 20 long and 7 wide. Hysterosoma 340 long and 165 wide at its base. There are 45 transverse striations in the midline of hysteronotum; behind this area the striations are strongly oblique or longitudinal and more posteriorly (behind setae *d4*) they are again transverse. *Venter* : Coxae I and II with serrated longitudinal membranous clasper organs 126 and 105 long respectively. Median area behind the posterior lip of vulva almost completely striated longitudinally except in two short areas bearing a few short transverse striations. Copulatory aperture paramedian at about 100 from posterior extremity. Setae *l5* 250 long (?incomplete), *l4* 80.

The type is deposited in the Museum of Natural History, London.

***Geomylichus (Ageomylichus) oaxacae* sp. n.**

Female holotype (Figs 3-4) : Total length of the body 558, maximum width (at level of epimeral arch of legs III) 140. Length and width in 5 paratypes : 540 × 126; 554 × 132; 555 × 135; 570 × 126; 573 × 138. *Dorsum* : Length of prescapular shield 120, of postscapular shield (in midline) 144 long. Postscapular shield with 38 transverse striations counted along a line joining seta *sci* and *d1*. Setae *sce* 18-20 long and 6 wide. Hysteronotum 285 long and 135 wide at its base. There are 20-22 transverse striations between postscapular shield and setae *d2*; behind these setae there are about 40-50 additional transverse striations but these posterior striations are visible only in the specimens in good condition and not dilated. *Venter* : The median area behind the vulvar lip is completely striated transversely. These transverse striations extend posteriorly to the anterior part of the opisthogaster. Copulatory aperture ventro-lateral, situated at 40 from the posterior extremity of the body. Serrated clasping membranes of coxae I-II 120 and 100 long respectively. Setae *l5* 220, *l4* 45-50 long.



Figs 5-6. *Geomylichus (Ageomylichus) oaxacae* sp. n. Male. Hysterosoma in dorsal (5) and ventral view (6). Scale line 100 µm.

Male (Figs 5-6) : Total length and width of body in 3 paratypes males : 498 × 135; 510 × 138; 519 × 120. Postscapular shield 135 long, bearing 25 transverse striations (counted along a line joining setae *sci* and *d1*). Setae *sce* 18 long and 6 wide. Hysteronotum with 16-18 transverse striations. The region behind the *d2* is punctate, and bears laterally in its anterior third 8 incomplete transverse striations. This shield is bordered laterally by a pair of strong sclerotized longitudinal sclerites. Posterior extremity incised in middle forming two lobes each of them bearing a round membrane (? modified hair). Serrated clasping membranes of coxae I and II as in the female. Total length of penis 42, it is flanked by a pair of thick cylindrical sclerites 40 long.

Host and locality :

Holotype female from a rodent *Heteromys desmarestianus*, collected from Mpio, Santa Maria, Chimalapas, Oaxaca State, Mexico, 27.VI. 1995. *Paratypes* : 19 females and 17 males all with same data as holotype; 3 females and 2 males from a marsupial *Marmosa* sp. and 1 male and 1 tritonymph from a bat, with same data as holotype but collected on 22.VI.1995. All the mites were collected by M.L. ESTEBANES. Catal.n°UMSP 299 (*Heteromys*), n°282 (Marmosa) and n°281 (Bat).

Holotype and paratypes deposited in the collection of Instituto de Biologia, Universidad Nacional Autonoma de Mexico (IBUNAM). Paratypes in the collections of the authors, in the Institut royal des Sciences naturelles de Belgique, in the U.S. National Museum of Natural History and in the Museum of the Natural History, London.

References

FAIN A., 1963. - Les Acariens producteurs de gale chez les Lémuriens et les Singes avec une étude des Psoroptidae (Sarcoptiformes). *Bull. Inst. r. Sci.*

nat. Belg. 39, n°32 : 1-125.

FAIN A., 1970. - Diagnoses de nouveaux Lobalgides et Listrophorides (Acarina : Sarcoptiformes). *Rev. Zool. Bot. Afr.* 86 : 271-300.

FAIN A., 1973. - Diagnoses d'Acariens nouveaux (Listrophoridae et Myobiidae). *Rev. Zool. Bot afr.* 87 : 330-332.

FAIN A., 1976. - Nouveaux acariens parasites de la superfamille Listrophoroidea (Astigmates). *Acta zool. pathol. antverp.* n°64 : 37-67.

FAIN A., 1981. - Notes sur les Listrophoridae (Acari-,Astigmata). I. Distribution géographique, caractères morphologiques et clé des genres. *Acarologia* 22 : 305-312.

FAIN A. & Hyland K., 1974. - The listrophoroid mites in North America : II. The family Listrophoridae Megnin and Trouessart (Acarina : Sarcoptiformes). *Bull. Inst. r. Sci. nat. Belg.* 50 : 1-69.

FAIN A. & WHITAKER Jr J.O., 1987. - New observations on the genus *Geomylichus* FAIN, 1970 (Acari, L istrophoridae) with description of four new species and a new subgenus. *Intern. J. Acarol.* 13 : 15-28.

FAIN A., WHITAKER Jr J.O. & THOMAS H.H., 1988. - Two new species of *Geomylichus* FAIN, 1970 (Acari : Listrophoridae) from California, U.S.A. *Internat. J. Acarol.* 14 : 121-125.

FAIN A., WHITAKER Jr J.O. & THOMAS H.H., 1991. - Two new fur mites of the genus *Geomylichus* FAIN, 1970 (Acari, Listrophoridae) from Kangaroo rats, *Dipodomys* spp., from the U.S.A. *Intl. J. Acarol.* 17 : 175-180.

FAIN A., WHITAKER Jr. J.O., SCHWAN T.G. & LUKOSCHUS F.S., 1978. - Notes on the genus *Geomylichus* FAIN, 1970 (Astigmata : Listrophoridae) and descriptions of six new species. *Internat. J. Acarol.* 4 : 101-114.

HOFFMANN A. & SERVIN R., 1990. - Una especie nueva de listroforido asociado a un roedor de Baja California Sur. *Southwest. Entomol.* 15 : 333-338.

MCDANIEL B., 1965. - The subfamily Listrophorinae Gunther, with a description of a new species of the genus *Listrophorus* from Texas (Acarina, Listrophoridae). *Acarologia* 7 : 704-712.

RADFORD C., 1949. - New parasitic mites (Acarina : Myialgesidae and Listrophoridae). *Proc. Zool.Soc.* 118-937.

SERVIN R, AGUILAR R. & ALVAREZ-CASTAÑEDA S., 1992. - Una nueva especie del genero *Geomylichus* FAIN, 1970, de Isla Cerralvo, Baja California Sur, Mexico. *Southwest.Entomol.* 17 : 341-345.

SERVIN R., AGUILAR R. & ALVAREZ-CASTAÑEDA S., 1994. - Una nueva especie del genero *Geomylichus* FAIN, 1970, presente en un roedor endemico de Baja Calif ornia Sur, Mexico. *Southwest. Entomol.* 19 : 285 -289.

VARGAS M., PEREZ T.M. & POLACO O.J., 1999. - The genus *Geomylichus* FAIN, 1970 (Acari : Listrophoridae) from Mexico, with descriptions of four new species. *Internat. J. Acarol.* 25 : 3-12.

WILSON D.E. & REEDER A.M., 1993. - Mammals species of the World. A taxonomic and geographic reference, 2d Edit. Smithsonian Institution Press, Washington and London, 1206 pp.

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Notes sur les Asilidae paléarctiques (Diptera Brachycera) (14-18)

Laphria flava (LINNÉ, 1761)

Laphria bomboides MACQUART, 1849 et *Machimus cowini* (HOBBY, 1946)

par Guy TOMASOVIC

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Abstract

Two new synonymies are related, *Laphria flava* (LINNÉ, 1761) = *Laphria bellifontanea* VILLENEUVE, 1928 and *Laphria bomboides* MACQUART, 1849 = *Laphria praelusia* SÉGUY, 1930. *Laphria benardi* VILLENEUVE, 1911 is labelled as subspecies of *Laphria bomboides* MACQUART, 1849. *Laphria flava* is recorded for the first time from Maghreb and *Machimus cowini* (HOBBY, 1946) is related also for the first time from Croatia.

Résumé

Deux synonymies nouvelles : *Laphria flava* (LINNÉ, 1761) = *Laphria bellifontanea* VILLENEUVE, 1928 et *Laphria bomboides* MACQUART, 1849 = *Laphria praelusia* SÉGUY, 1930. *Laphria benardi* VILLENEUVE, 1911 est ramené au rang de sous-espèce de *Laphria bomboides* MACQUART, 1849. *Laphria flava* est mentionnée pour la première fois du Maghreb ainsi que *Machimus cowini* (HOBBY, 1946) de Croatie.

Introduction

Les Asilidae du genre *Laphria* ont été d'abord séparés en s'appuyant principalement sur la coloration de la pubescence (SÉGUY, 1927). Ce caractère présente, hélas, une variation intraspécifique étendue, rendant ainsi l'identification assez incertaine. Il était donc nécessaire de trouver des caractères offrant une plus grande constance. Dans sa faune des Asilidae de Palestine, THEODOR (1980) utilise et figure les genitalia de chaque espèce, tandis que LEHR (1989, 1992) insiste sur le fait que ces organes offrent des critères particulièrement fiables pour la séparation d'espèces dont l'habitus est très semblable.

14.- *Laphria flava* (LINNÉ, 1761) = *Laphria bellifontanea* VILLENEUVE, 1928

VILLENEUVE (1928) a décrit *Laphria bellifontanea* en se référant à une femelle et deux mâles pris en juillet dans la forêt de Fontainebleau (Seine-et-Marne). Il les distinguait de *L. flava* (LINNÉ) par leur vestiture entièrement jaune doré, caractère parfaitement aléatoire quand on sait que la coloration de *L. flava* passe du jaune très clair au brun presque noir, en passant par le roux.

Dans la collection VILLENEUVE, conservée à l'Institut royal des Sciences naturelles de Belgique, figurait un mâle étiqueté " *L. bellifontanea* ", par VILLENEUVE et provenant également de la forêt de Fontainebleau. Après dissection, j'ai pu constater que les genitalia de ce spécimen ne différaient en rien de ceux de *L. flava* et, par conséquent, que *L. bellifontanea* VILLENEUVE, 1928 était simplement synonyme de *Laphria flava* (LINNÉ, 1761).

15.- *Laphria benardi* VILLENEUVE, 1911 sous-espèce de *Laphria bomboides* MACQUART, 1849

Le type de *Laphria benardi* VILLENEUVE, 1911 est un mâle provenant de Campo dell'Ori (Corse), pris le 16.VI.1910. Dans les collections du Muséum de Paris figurent deux mâles de cette