THE GENUS GALENDROMUS MUMA, 1961
(ACARINA: PHYTOSEIIDAE)

MARTIN H. MUMA
University of Florida Citrus Experiment Station, Lake Alfred

The genus *Galendromus* Muma, 1961 was erected for those species of phytoseids in which the females have six pairs of (D) dorsal setae, two pairs of (M) median setae, nine pairs of simple or weakly plumose (L) lateral setae (five anterior to D1), one pair of (S) scapular setae on the interscutal membrane, two pairs of sternal setae, four pairs of preanal, ventrianal setae and the fourth leg with no or only one macroseta on the fourth basitarsus. *Typhlodromus floridanus* Muma, 1955 was designated as the type and ten other species were cited as belonging in the genus. At the same time, three species groups within the genus were characterized, one with plumose subequal dorsal and lateral setae, one with simple dorsal setae distinctly smaller than simple lateral setae, and one with tiny, simple dorsal setae and plumose lateral setae.


*Trichoseius* is a subjective synonym of the genus and typical subgenus *Galendromus*, Muma 1963a, and is not available for use. *Menaseius* is, however, a valid, available name which is elevated to subgeneric rank in this paper. *Lamiaseius* is here considered to be a synonym of *Menaseius*. A third subgenus, *Leonodromus* new subgenus, is erected for two unique Mexican species, *Galendromus carinalatus* (DeLeon) and *Galendromus luculentis* (DeLeon).

Hirschmann (1962) following his suggested new system of classification of Parasitiformes based on the morphology of immatures and mouthparts (Hirschmann 1957) has recombined almost all of the genera proposed to date in the genus *Typhlodromus* Scheuten, 1857. There can be no question that there are basic morphologic similarities among the larvae, nymphs and mouthparts of *Phytoseiidae*, *Acarosaiidae*, *Diggamasellidae*, *Laelaptidae* and many other families of *Mesostigmata*. It seems unwise, however, to ignore differences in adult morphology, biology and ecology (Muma 1965b) that indicate species groupings at levels below those proposed by Hirschmann (1962). Hirschmann’s findings and arguments raise questions about the validity of the presently recognized cohortial, familial and subfamilial classification of *Mesostigmata*, but it is doubtful that they can be logically applied at the generic and subgeneric levels.

At the present time 16 species of the genus *Galendromus* are known, six in typical subgenus *Galendromus*, eight in the subgenus *Menaseius*, and two in *Leonodromus*. Because of the potential economic importance of several species, each species is described, figured and diagnosed. Keys to the proposed subgenera and known species have also been included. For the

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sake of brevity references are largely confined to synonymies and have been restricted to those containing critical name changes.

The descriptions and illustrations were made of specimens mounted in Hoyer’s (chloral hydrate) medium and examined under magnifications varying from 125X to 1250X. All measurements were made at 125X and corrected to the nearest 0.01 mm.

Genus *Galendromus* Muma, 1961


In the original description of the genus only the most distinctive, diagnostic characters of females were cited. The species that comprise this genus do, however, possess many generically constant features in both the female and male sex. For this reason, as well as to shorten specific descriptions, a detailed delineation of the genus is given here.

Females have a reticulate and/or imbricate dorsal scutum bearing six pairs of dorsal setae, two pairs of median setae and nine pairs of lateral setae. Most species also have pores on the dorsal scutum in the following locations, between D, and L₁, between D, and L₅ and just anterior to M₁. A single pair of scapular setae lies on the interscutal membrane on a level with or just anterior to the fourth pair of lateral setae. The sternal scutum is smooth or faintly lined, as long or longer than wide and usually provided with two pairs of sternal setae. Most species have two pairs of metasternal scuta, each provided with a seta; some specimens have the anterior pair indistinctly separated from the sternum. These scuta are faint or lacking on some specimens and species. The genital scutum covers the genital pore, is spatulate anteriorly, parallel-sided and sharply truncate posteriorly. There are two pairs of elongate, slender metapodal scuta, the outer or primary pair of which is two to five times longer than the inner or secondary pair. The ventrianal scutum varies in shape from pentagonal to an elongate vase, is usually weakly creased or reticulate, and is provided with four pairs of preanal setae. There are normally two apical teeth in addition to the *pilis dentilis* on the fixed finger of the chelicerae and no or only one tooth on the strongly curved movable finger. The legs are moderately long, stout, and provided with no or at most one macroseta on the fourth basitarsus.

Males have the dorsal scutum similar in structure and setation to the females except that the scapular setae occur on the scutum rather than on the interscutal membrane. The stern-genital scutum extends from the first to the fourth coxae, covers the slot-like anterior genital pore and is provided with five pairs of setae. The ventrianal scutum covers the venter behind the fourth legs, is broadly shield-shaped and is usually provided with four pairs of preanal setae; one species and some specimens of other species have only three or even two pairs of preanals. The chelicerae, except for the spermatophore bearer which is attached to the movable finger, and legs are the same as on the female.

Type Species: *Typhlodromus floridanus* Muma, 1955.
Muma: The Genus Galendromus

Key to Subgenera of Galendromus Muma

1. Most dorsal and lateral setae plumose and usually subequal in length................................................................................................................Galendromus Muma
   Most dorsal setae simple and distinctly smaller than lateral setae........2
2. Most lateral setae simple and only slightly longer than dorsal setae................................................................................................................Menaseius Wainstein
   Most lateral setae plumose and much longer than dorsal setae........Leonodromus new subgenus

Subgenus Galendromus Muma


Females of this subgenus have most of the dorsal and lateral setae plumose. Many of the setae on the dorsal scutum are elongate and extend posteriorly to or beyond the base of the succeeding setae. The dorsal scutal pores are often difficult to distinguish in this subgenus. The ventral scutum is elongate and somewhat constricted near the middle of its length. None of the known species possesses a macroseta on the fourth basitarsus.

The spemaphora has slender tubular cervix that is flared slightly at the mesal end and not or scarcely swollen at the atrium; the spermatophore bearer is L-shaped with two acute spurs, one at and one near the angle of the I.

Type Species: Typhlodromus floridanus Muma, 1955.

Key to the Species of Subgenus Galendromus Muma

1. M₁ distinctly shorter than D₁; peritreme extending forward beyond L₁ on females, L₁ on males.................................................................2
   M₁ as long or longer than D₁; peritreme not extending forward beyond L₁ on females or L₁ on males.........................................................3
2. L₁ and L₅ subequal with L₆ and L₉; D₅ extending to D₄ floridanus (Muma)
   L₄ and L₇ much shorter than L₆ and L₉; D₅ not extending to D₄.................................................................gratus (Chant)
3. Peritreme extending forward to L₆-L₇ area on females,
   the L₄-L₅ area on males, tiny species...........................................................4
   Peritreme extending forward to L₅-L₇ area on females.
   to L₆-L₇ area on males, larger species...............................................................5
4. Dorsal scutum smooth at antero-lateral margins; D₅ only one-half as long as distance to D₅; 2 pairs of ventro-lateral interscutal setae....................................................ferrugineus DeLeon
   Dorsal scutum imbricate over entire surface; D₅ nearly as long as distance to D₅; 3 pairs of ventro-lateral interscutal setae..............................................................annectens (DeLeon)
5. Peritreme extending forward to L₁ on female, to L₅ on males; dorsal setae longer than intervals between setae....................longipilis (Nesbitt)
   Peritreme extending forward to L₅ on females, to L₆-L₉ area on males; dorsal setae only as long as intervals between setae........occidens (Nesbitt)

* See Addendum.
Galendromus (Galendromus) floridanus (Muma)

Figures 1 to 6, 12A and B, 18, 24, 28 and 29


*Typhlodromus (Typhlodromus) helveolus* Chant, 1959, Canadian Entomologist 91 (suppl. 12): 58, figs. 58, 59 (female) (new name for junior homonym caused by combination of Amblyseiusopsis Garman with Typhlodromus Scheuten).


**Females**: The dorsal scutum is 0.34 to 0.40 mm. long, 0.18 to 0.28 mm. wide and distinctly imbricate and reticulate except on the posterior declivity, where it is rugose and bears a pair of globular knobs just in front of D₅. The dorsal setae, except for D₅ and lateral setae, are elongate, plumose and subequal in length; they gradually increase in length toward the posterior end of the scutum. D₅ extends to or beyond the base of D₅. D₅ is minute and simple. L₅ and L₇ are slightly shorter to subequal with L₅ and L₇. M₅ is distinctly shorter than the dorsals and laterals, but M₅ is subequal with L₅ and L₇. S₃ is plumose and slightly smaller than the associated laterals.

There are 2 pairs of metapodal scuta; the primary is an elongate ellipse; the secondary is a slender crescent. The ventral scutum is an elongate pentagon that is slightly constricted in the anterior third of its length, lightly creased and reticulated, and provided with a widely spaced pair of small but distinct elliptical preanal pores that lie just posterior to and between the third pair of preanal setae. There are three pairs of ventrolateral interscutal setae. The peritreme is long, extending forward to L₇. Spermaphc as in figure 18.

**Males**: The dorsal scutum is 0.27 to 0.30 mm. long and 0.16 to 0.19 mm. wide. The ventral scutum is lightly creased and reticulated and bears a pair of elliptical preanal pores. The peritreme is long, extending forward to the L₅-L₇ area.

The spermaphore bearer is as shown in figure 24. There is a conical process on the ventral surface of the femora of leg 2.

**Type Locality**: Female holotype, male allotype and male and female paratypes feeding on six-spotted mites, *Eotetranychus sexmaculatus* Riley, on citrus seedlings at Lake Alfred, Florida, on March 6, 1952, in the United States National Museum.

**Remarks**: Although females in natural populations of this species possess four pairs of preanal setae on the ventral scutum, females in laboratory cultures frequently have only three pairs.

This is a common species on citrus trees in Florida. Chant (1959) recorded it from Texas, and DeLeon (1959) cited Mexican records.

Ten females and ten males from Florida citrus were utilized in the above size range measurements.

**Diagnosis**: Females of this species are readily distinguished from most species by the short M₅, the unusual knobs on the posterior declivity of
Plate Legends

Figures 1 to 5. *Galendromus (Galeendromus) floridanus* (Muma). 1. female dorsum. 2. female ventrum. 3. male dorsum. 4. male ventrum. 5. process on second femur of male.
the dorsal scutum and the long slender spermathecae. Males are distinguished by the short M, the conical process on the femur of leg 2 and the knobs on the posterior declivity of the dorsal scutum. The species differs from the closely related G. gratus (Chant) in the longer D, longer L, and L, and more closely spaced preanal, ventrianal pores.

**Galendromus (Galendromus) gratus (Chant)**

Figures 7, 17, 23 and 30

*Typhlodromus (Typhlodromus) gratus* Chant, 1959, Canadian Entomologist 91 (Suppl. 12): 58, figs. 60, 61. (female)


**FEMALE HOLOTYPE:** The dorsal scutum is 0.33 mm. long, 0.16 mm. wide and imbricate except on the posterior declivity, where it is lined and rugose. The dorsal setae, except for D, and lateral setae are elongate and plumose extending to or just beyond the bases of the succeeding setae. D, extends only half way to D,. D, is minute and simple. L, and L, are much shorter than either L, or L,. M, is small, less than half the length of D, and M, is distinctly smaller than L,. S, is elongate and plumose but distinctly smaller than the associated laterals.

The primary metapodal scutum is about three times as long as the secondary. The ventrianal scutum is pentagonal, constricted in the anterior third of its length, lightly creased and reticulated, and provided with a pair of distinct, elliptical, widely spaced pair of preanal pores that lie just posterior to and outside of the third pair of preanal setae. There are three pairs of ventro-lateral interscutal setae. The peritreme is long, extending forward to L,. Spermatheca as in figure 23.

**MALE:** Unknown.

**TYPE LOCALITY:** Female holotype from *Thespesia populnea* at Key West on June 4, 1958, (O. D. Link), in the United States National Museum in Washington, D. C.

**REMARKS:** This species is known only from the type, one additional female and a deutonymph, all taken at the same time. The above description, measurements and figures are of the type.

**DIAGNOSIS:** This species is readily distinguished by the small size of D, L, L, and M, and the position of the preanal pores on the ventrianal scutum. It is very closely related to *G. floridanus* but on the basis of known material seems to be distinct.

**Galendromus (Galendromus) annectens (DeLeon)**

Figures 8, 13A and B, 19. 25, 31 and 32

*Typhlodromus annectens* DeLeon, 1958, Florida Entomologist 41(2): 75, fig. 12. (female and male)

*Typhlodromus annectens* DeLeon, 1958, Florida Entomologist 42(3): 128. (female and male)


**FEMALES:** The dorsal scutum is 0.20 to 0.31 mm. long, 0.12 to 0.15 mm.
wide and loosely imbricate except on the posterior declivity, which is weakly ridged. The dorsal setae, except for D₁ and D₅, and lateral setae are elongate, plumose and subequal in length, gradually increasing in length toward the posterior end of the scutum. D₁ is plumose and one-half the length of D₅; D₅ is minute and simple. S₁ is plumose and slightly smaller than the associated laterals.

Both pairs of metapodal scuta are long and slender, the secondary about one-fifth as long as the primary. The ventrianal scutum is sub-pentagonal, constricted near the middle of its length, lightly creased and reticulated, and provided with a widely-spaced pair of minute, sometimes indistinct preanal pores. There are three pairs of ventro-lateral interscutal setae. The peritreme is moderately long, extending forward to the L₂-L₅ area. Spermatria as in figure 19.

MALES: The dorsal scutum is 0.21 to 0.23 mm. long and 0.11 and 0.13 mm. wide.

The ventrianal scutum is weakly creased and bears a pair of small preanal pores. The peritreme is short, extending forward only to the L₄-L₅ area.

The spermaphore bearer is as shown in figure 25. The second legs bear no femoral processes.

TYPE LOCALITY: Female holotype and male allotype from Coral Gables, Florida, on June 4, 1956 (D. DeLeon) from Trema floridana in the collection of Don DeLeon at Erwin, Tennessee.

REMARKS: Females in natural populations frequently exhibit three instead of four preanal setae on the ventrianal scutum. Two females from Ohio lack imbrication on the dorsal scutum and the peritremes extend forward to just in front of L₄. A male and female from California have the imbrication but the peritremes extend only to the L₄-L₅ area.

This is a common species on trees, shrubs and vines in Florida. DeLeon (1950) recorded it from Mexico.

The above size range measurements are based on 10 females and 5 males from Florida.

DIAGNOSIS: The small size and moderately long peritreme distinguish females of this species. Males may be distinguished by their small size and form of the spermaphore bearer.

_Gaellonum (Gaellonum) ferrugineus_ DeLeon

Figures 9, 14, 20 and 37


FEMALES: The dorsal scutum is 0.28 to 0.30 mm. long, 0.14 to 0.15 mm. wide and smooth except for a faint reticulation on the anterior and lateral margins. The dorsal setae, except for D₁ and D₅, and lateral setae, are slender, elongate and plumose, but the laterals are one-third longer; D₁ is simple and about two-thirds as long as D₅; D₅ is minute and simple. S₁ is slender, plumose and slightly smaller than the associated laterals.

Both pairs of metapodal scuta are long, slender rods, the secondary about one-third the size of the primary. The ventrianal scutum is sub pentagonal, constricted in the anterior third of its length, is lightly creased and reticulated and is provided with a pair of indistinct, widely spaced preanal pores.
There are two pairs of ventro-lateral interscutal setae. The peritreme is long, extending forward to the area between \( I_a \) and \( I_n \). Spermatheca as in figure 20.

**Males:** Unknown.

**Type Locality:** Female holotype on *Carpinus caroliniana* at Erwin, Tennessee, September 29, 1960 (D. DeLeon) in the collection of D. DeLeon at Erwin, Tennessee.

**Remarks:** This species is known only from the type and paratype from which the above description, measurements and figures were made. It is the only species of this subgenus that has the dorsal setae distinctly smaller than the lateral setae.

**Diagnosis:** The very slender, shorter, dorsal setae, only two ventro-lateral interscutal setae and the wide, short cervix of the spermatheca readily distinguish this species.

*Galendromus* (*Galendromus*) *longipilus* (Nesbitt)

Figures 10, 15A and B, 21, 26, 33 and 34

*Typhlodromus longipilus* Nesbitt, 1951, Zoologische Verhandelingen, No. 12: 26, pl. 9, fig. 8, pl. 11, figs. 21 and 24. (female)

*Typhlodromus* (*Typhlodromus*) *longipilus* : Chautin, 1959, Canadian Entomologist 91 (suppl. 12): 59, figs. 62, 63. (female)


**Females:** The dorsal scutum is 0.31 to 0.33 mm. long, 0.15 to 0.17 mm. wide and imbricate over its entire surface; the imbrication is wrinkled on the posterior declivity. The dorsal setae, except for \( D_1 \) and \( D_5 \) and lateral setae are elongate, plumose and subequal in length, and usually well overlap the bases of the succeeding setae. \( D_1 \) is simple and about one-third the length of \( D_5 \); \( D_5 \) is slightly smaller than \( D_1 \) and simple. \( S_1 \) is plumose and slightly smaller than the associated laterals.

There are two pairs of metapodal scuta; the principal is an elongate ellipse; the secondary is a slender crescent. The ventrianal scutum is vase-shaped, widest in the anal region, weakly creased and provided with a pair of indistinct, very widely spaced, punctate preanal pores. There are three pairs of ventro-lateral interscutal setae. The peritreme is short, extending forward to the \( L_a \) area. Spermatheca as in figure 21.

**Males:** The dorsal scutum is 0.24 to 0.25 mm. long and 0.14 to 0.15 mm. wide.

The ventrianal scutum is weakly creased and bears four pairs of preanal setae, a faint pair of very widely spaced preanal pores. The peritreme is short, extending forward only to \( L_n \).

The spermatophore bearer is as shown in figure 26. There is no conical process on the femur of leg 2.

**Type Locality:** Female holotype from apple leaves, October 6, 1947, Central Experimental Farm, Ottawa, Canada, No. 5967 in the Canadian National Collection at Ottawa.

**Remarks:** Natural populations of females exhibit considerable variation in the setation of the sternal and ventrianal scuta. The sternal scutum may have two or three pairs of setae, and the ventrianal scutum may have three or four pairs of preanal setae.
This is a common species in eastern Canada and the United States but occurs throughout both countries in the temperate climatic zone.

The above size range measurements are based on seven females and two males from central Ohio.

Diagnosis: Both sexes of this species are most easily distinguished by the moderate length of the peritreme and the strong overlapping of dorsal scutal setae.

_Galeondromus_ (Galeondromus) occidentalis_ (Nesbitt)

Figures 11, 16A and B, 22, 27, 35 and 36

_Typhlodromus occidentalis_ Nesbitt, 1951, Zoologische Verhandelingen, no. 12: 29. (female and male)

_Typhlodromus_ (Typhlodromus) occidentalis: Chant, 1959, Canadian Entomologist 91 (suppl. 12): 59, figs. 64, 65. (female)


_Females:_ The dorsal scutum is 0.32 to 0.33 mm. long, 0.18 to 0.22 mm. wide and imbricate over its entire surface. The dorsal setae, except for _D_1 and _D_6, and lateral setae are elongate, plumose and subequal in length, and extend to or just beyond the bases of the succeeding setae. _D_1 is simple and about one-half the length of _D_6, and _D_6 is minute and simple. _S_ is plumose and slightly smaller than the associated laterals.

The anterior pair of metasternal scuta is frequently adjacent or connected to the posterior margin of the sternum. The primary metapodal scutum is 2½ to 3 times the length of the secondary. The ventrianal scutum is vase-shaped, widest in the anal region, weakly creased and provided with a pair of indistinct widely-spaced punctate preanal pores. There are three pairs of ventro-lateral interscutal setae. The peritreme is short, extending forward scarcely to _L_6. Spermatheca as in figure 22.

_Males:_ The dorsal scutum is 0.27 to 0.31 mm. long and 0.15 to 0.17 mm. wide.

The ventrianal scutum is weakly creased and bears only three pairs of preanal setae and a pair of faint, very widely-spaced preanal pores. The peritreme is very short, not extending forward to _L_6.

The spermatophore bearer is as shown in figure 27. There are no conical processes on the femora of leg 2.

_Type Locality:_ Female holotype from rose, preying on _Tetranychus_ sp., Brandon, Manitoba, summer 1950, No. 5968 in the Canadian National Collection, Ottawa, Canada.

_Remarks:_ Natural populations of females vary from two to three in the number of pairs of sternal setae and from three to four in the number of pairs of preanal setae on the ventrianal scutum.

Although this species seems to be most common on the west coast of North America in the temperate climatic zone, it is also found in eastern states and provinces.

The above description, measurements and figures are based on ten females and three males from Canada and California.
**Muma: The Genus Galendromus**

**Diagnosis:** Both sexes of this species are most easily distinguished by the very short length of the peritreme and the slight if any overlap of the dorsal setae.

**Subgenus Menaseius Wainstein**


Species of this subgenus have most of the dorsal and lateral setae simple. Most dorsal setae are shorter than the distance to the succeeding setae. The anterior pair of dorsal scutal pores is quite distinct with the reticulation seeming to radiate from the pore. The ventrianal scutum is pentagonal, but slightly constricted near the middle of its length. Most of the known species possess a macroseta on the base of the fourth tarsus.

The *spermatheca* has a funnel-shaped cervix and a highly refractive structure which appears to be a gate-like valve at the atrium; the *spermatophore* bearer is L-shaped with two, usually mesally projecting, spurs at the heel of the L.

Wainstein (1962) separated *Lamiaseius* from *Menaseius* on the basis of the number of ventro-lateral interscutal setae. Similarity in the *spermathecae*, spermatophore bearers and dorsal scutal structure and setation seem, however, to outweigh a variation in ventro-lateral interscutal setae. *Lamiaseius* is, therefore, synonymized under *Menaseius*, which has line priority in Wainstein's paper.

**Type Species:** *Seius pomi* Parrott, 1906.

**Key to Species of Subgenus Menaseius Wainstein**

1. **M₂** less than half as long as distance to **Lₐ**; **Lₐ** minute, only one-third as long as distance to **Lₐ**..............................2
   **M₂** more than half as long as distance to **Lₐ**; **Lₐ** small but at least one-half as long as distance to **Lₐ**..............................3
   
2. Females with 2 pairs of ventro-lateral interscutal setae..................................................*juniperoides* DeLeón
   Females with 3 pairs of ventro-lateral interscutal setae..................................................*juniperi* (DeLeón)
   
3. **M₂** longer than distance to **Lₐ**..................................................*fumewis* (Chant)
   **M₂** shorter than distance to **Lₐ**..................................................4
   
4. Ventrianal scutum with preanal pores; 3 pairs of ventro-lateral interscutal setae.................................5
   Ventrianal scutum without preanal pores; 2 pairs of ventro-lateral interscutal setae.................................*megregori* Chant

5. Ventrianal scutum with tiny, indistinct preanal pores; fourth basitarsus without a distinct macroseta..................................................*pomi* (Parrott)
   Ventrianal scutum with large, distinct preanal pores; fourth basitarsus with a distinct macroseta.................................6

6. **Lₐ** about one-half as long as **Lₐ**; **M₂** extending almost to **Lₐ**..................................................*mexicanus* n. sp.
   **Lₐ** nearly as long as **Lₐ**; **M₂** not extending to **Lₐ**..................................................7

7. Spermathecal cervix wide and short..................................................*delicatus* DeLeón
   Spermathecal cervix narrow and long..................................................*ruralis* DeLeón
Galendromus (Menaseius) pomi (Parrott)

Figures 38 to 41, 46, 57, 64, 67 and 76


Typhlodromus pomi: Nesbitt, 1951, Zoologische Verhandelingen, no. 12-28, pl. 3, fig. 7, pl. 11, fig. 16. (female and male)

Typhlodromus (Typhlodromus) pomi: Chant, 1959, Canadian Entomologist 91 (Suppl. 12): 56, figs. 62, 53. (female)


Typhlodromus (Typhlodromus) pomi: Wainstein, 1962, Acarologia 4(1): 21, fig. 47. (female)


**FEMALES:** The dorsal scutum is 0.28 to 0.30 mm. long, 0.15 to 0.18 mm. wide and is reticulate and imbricate except on the posterior declivity, where it is weakly ridged. The dorsal setae are short and extend less than half way to the succeeding setae but are progressively longer posterior to Dc; Dc is minute. The lateral setae are somewhat longer than the dorsal setae and also increase in length posteriorly to Lc; Lc is short, but distinctly longer than Lr, and about its length from Lr; Lr is about twice the length of Ls and plumose. M1 is about equal to Dc in length, and M2 is one-third longer than Dc. S is subequal to the associated lateral setae.

There are two pairs of slender, elliptical, metapodal scuta, the primary about five times the length of the secondary. Between the genital scutum and the ventrianal scutum there is a long, slender, sometimes fragmented scutum. The ventrianal scutum is pentagonal with concave lateral margins, weakly creased and provided with a pair of punctate, indistinct preanal pores that lie just behind the third pair of preanal setae. There are three pairs of ventro-lateral intersegutal setae. The peritremes is long, extending forward to Dc. Spermaphor as in figure 46. There is no distinct macroseta on the basitarsus of leg 4.

**MALES:** The dorsal scutum is 0.22 to 0.24 mm. long and 0.12 to 0.14 mm. wide and weakly ridged. The ventrianal scutum is creased and bears a pair of punctate preanal pores.

The spermaphore bearer is as shown in figure 76.

**TYPE LOCALITY:** The type has apparently been lost or destroyed. Neotype, selected by D. A. Chant, collected on apple bark at the Belleville field station, Chatterton, Ontario, in March 1958, No. 6858 Canadian National Collection.

**REMARKS:** Many specimens, especially females, have a granular stippling overlaying the ornamentation of the dorsal scutum. Occasional males and females have only three pairs of preanal setae on one or both sides of the ventrianal scutum, and there are females that have only two pairs of ventro-lateral intersegutal setae.

This species is most common in northeastern United States and southeastern Canada.

The above description, measurements and figures are based on ten females and ten males from West Virginia and Ohio.
DIAGNOSIS: This species is easily distinguished from the closely related G. juniperi (DeLeon) by the much longer lateral and median setae. It is separated from G. ruralis DeLeon and G. delicatus DeLeon by the much shorter, lateral setae and the indistinct preanal pores on the ventrianal scutum.

*Galeldromus (Menaseius) ruralis* DeLeon

Figures 42, 47, 58, 65, 71 and 77

*Galeldromus ruralis* DeLeon, 1962, Florida Entomologist 45(1): 12, figs. 6-11. (female)

**FEMALES:** The dorsal scutum is 0.31 to 0.32 mm. long, 0.17 to 0.18 mm. wide and distinctly imbricated and reticulated except on the posterior declivity, where it is weakly ridged. The dorsal, median, lateral and sacral setae are much as in G. pomés except they are thicker and Ls is subequal to or slightly smaller than Ls.

The long, narrow scutum between the genital and ventrianal scuta is normally fragmented into four platelets, and the ventrianal scutum is proportionately shorter than in G. pomés and provided with distinct ovate preanal pores that lie between and adjacent to the third pair of preanal setae. There are three pairs of ventro-lateral interscutal setae. The peritreme is long; it extends forward to D. Spermatheca as in figure 47. There is an elongate, distinct macroseta on the basitarsus of leg 4.

**MALES:** The dorsal scutum is 0.22 to 0.24 mm. long and 0.14 to 0.160 mm. wide. The ventrianal scutum is creased and bears a pair of distinct ovate preanal pores.

There is a distinct macroseta on the basitarsus of leg 4. The spermatophore bearer is as shown in figure 77.

**TYPE LOCALITY:** Female holotype, Erwin, Tennessee, September 24, 1960 (D. DeLeon) on *Nyssa sylvatica* in the collection of D. DeLeon.

**REMARKS:** Frequent specimens, especially females, have a granular stippling overlaying the reticulation of the dorsal scutum.

This is a common species on many shrubs and trees in Tennessee, Ohio, Maryland, Virginia and North Carolina.

The above description, measurements and figures are based on five females and five males from central Ohio.

**DIAGNOSIS:** The species is easily distinguished from G. pomés by the large preanal pores, the broad lateral setae, and the comparatively smaller Ls as well as the elongate, distinct macroseta on the basitarsus of leg 4. It may be separated from G. delicatus DeLeon by the long, narrow cervix of the spermatheca.

*Galeldromus (Menaseius) delicatus* DeLeon

Figures 48, 49, 59 and 66

*Galeldromus delicatus* DeLeon, 1962, Florida Entomologist 45(1): 14, figs 12-16. (female)

**FEMALE HOLOTYPE:** The dorsal scutum is 0.31 mm. long, 0.15 mm. wide and imbricate and reticulate except on the posterior declivity, where it is weakly ridged. The structure and setation are much the same as in G.
pomi and G. ruralis except the setae M₂ and L₂ are longer and thicker on ruralis and L₂ is distinctly shorter than L₂ on this species.

There is no distinct scutum between the genital and ventrianal scuta. The ventrianal scutum is almost identical with that of G. ruralis; the preanal pores lie slightly behind the third pair of preanal setae. There are three pairs of ventro-lateral interscutal setae. The peritreme is long, extending forward to D₂. Spermatheca as in figure 48. There is a distinct macroseta on the fourth basitarsus.

**Male:** Unknown.

**Type Locality:** Female holotype from Rhamnus caroliniana of Fayetteville, Arkansas, on July 27, 1957 (D. DeLeon) in the collection of D. DeLeon at Erwin, Tennessee.

**Remarks:** This species is known only from the type.

**Diagnosis:** This species is most readily distinguished from G. ruralis by the proportionately wide, short cervix of the spermatheca.

*Galendromus (Menaseius) mexicanus new species*

Figures 45, 49, 60 and 68

**Female Holotype:** The dorsal scutum is 0.32 mm. long, 0.16 mm. wide and imbricate and reticulate except on the anterior portion of the posterior declivity, where it is weakly ridged. The structure and setation are much the same as in G. pomi and G. ruralis except M₂ and L₂ are longer and thicker and L₂ is only half as long as L₂.

The long, narrow scutum between the genital and ventrianal scuta is very narrow and fragmented into a series of platelets. The ventrianal scutum is an elongate pentagon that is constricted laterally in the anterior third of its length, nearly smooth, and provided with a pair of crescentic preanal pores that lie just posterior of and mesad to the third pair of preanal setae. There are three pairs of ventro-lateral interscutal setae. The peritreme is long, extending forward to D₂. Spermatheca as in figure 49. There is a distinct macroseta on the fourth basitarsus.

**Male:** Unknown.

**Type Locality:** Female holotype from Ficus ? at Chapala, Jul. Mexico, on March 22, 1957 (D. DeLeon) in the collection of D. DeLeon at Erwin, Tennessee.

**Diagnosis:** This species is readily distinguished from the closely related G. ruralis and G. delicatus by the extreme length of M₂ and L₂, and much smaller size of L₂.

*Galendromus (Menaseius) juniperi (DeLeon)*

Figures 44, 50, 60 and 69

Typhlodromus juniperi DeLeon, 1959, Florida Entomologist 42(3):127, fig. 4. (female)


Galendromus juniperi (DeLeon), 1962, Florida Entomologist 45(1):15, fig. 22. (female)

FEMALE HOLOTYPE: The dorsal scutum is 0.33 mm. long, 0.17 mm. wide and imbricate and reticulate except on the anterior portion of the posterior declivity, where it is weakly ridged. The dorsal setae, except for Ds and Dl, are short and subequal in length; Dl is about twice the length of Ds, and Dl is minute. The lateral setae are about twice the length of the dorsal setae and, except for Ls and Ll, are subequal. Ls is about the same length as the dorsal setae and is 3 times its length from Ll. Ll is one-fourth longer than Ls and plumose. Ms is subequal to Ds and Ml is subequal to or slightly smaller than Ls. Ss is distinctly larger than the associated lateral setae.

There are two pairs of long, slender metapodal scuta, the primary about four times as long as the secondary. The ventrianal scutum is subpentagonal with concave lateral margins, weakly creased and reticulate and not provided with preanal pores. There are three pairs of ventro-lateral interscutal setae. The peritreme is long, extending forward almost to Dl. Spermaphica as in figure 50. There is no distinct macroseta on the basitarsus of leg 4.

MALE: Unknown.

TYPE LOCALITY: Female holotype from Croton torrevana at Reynosa, Tama, Mexico, on December 18, 1956 (D. DeLeon) in the collection of D. DeLeon at Erwin, Tennessee.

DIAGNOSIS: This species is most easily distinguished from G. pont by the very short lengths of the dorsal and lateral setae on the dorsal scutum and the absence of preanal pores on the ventrianal scutum.

Galendromus (Menasseius) megregori (Chant)
Figures 51, 54, 63, 72, 73 and 78

Typhlodromus (Typhlodromus) megregori Chant, 1959, Canadian Entomologist 91 (Suppl. 12) : 57, figs. 54, 55. (female)


Typhlodromus (Typhlodromus) megregori: Wainstein, 1962, Acarologia 4(1) : 21, fig. 39. (female)


FEMALES: The dorsal scutum is 0.32 to 0.33 mm. long, 0.17 to 0.19 mm. wide, indistinctly reticulate and ridged, overlaid with a punctate stippling, over the entire surface. The dorsal setae are shorter than the lateral setae but increase in length posteriorly except for Ds, which is minute. The lateral setae are elongate, extending nearly to the bases of the succeeding setae; Ls is small but less than twice its length from Ll; Ll is weakly plumose. Ms is subequal in length with Ds, and Ml is subequal to Ll and plumose. Ss is slightly longer than the associated lateral setae.

There are two pairs of parapodal scuta, the primary long, slender and lightly curved, the secondary minute and triangular. Between the genitalic scutum and ventrianal scutum there is a fine, line-like thickening of the derm. The ventrianal scutum is elongate, vase-shaped, smooth or indistinctly creased and not provided with preanal pores. There are two pairs of ventro-lateral interscutal setae. The peritreme is long, extending forward to Dl. Spermaphica as in figure 51.
MALE: The dorsal scutum is 0.26 mm. long and 0.15 mm. wide. The ventrial scutum is smooth or indistinctly creased and not provided with preanal pores.

The spermatophore bearer is as shown in figure 78.

**TYPE LOCALITY:** Female holotype from *arborvitae* at Pasco, Washington in May, 1958, by E. C. Klostermeyer, No. 6853 in the Canadian National Collection.

**REMARKS:** Although this species seems to be mainly western in distribution, Chant (1959) also recorded it from Washington, D. C., Maryland, Virginia and Ohio. The specimens described above were from California and Washington and included six females and one male.

**DIAGNOSIS:** The species is distinguished from the closely related *G. flumenis* Chant by the fact the L₅ is slightly less than twice its length from L₄, and M₅ does *not* extend posteriorly beyond the base of L₄. D. A. Chant, in personal correspondence, stated that this species is synonymous or nearly so with *flumenis*. For the present, however, the above differences seem important enough to maintain the two species.

*Galendromus (Menaseius) flumenis* (Chant)

Figures 53, 55 and 75

*Typhlodromus (Typhlodromus) flumenis* Chant, 1957, Canadian Entomologist 89(7): 290, figs. 6, 7. (female)


**FEMALE HOLOTYPE:** The dorsal scutum is 0.32 mm. long, 0.19 mm. wide and lightly reticulate and ridged. The dorsal scutal setation is very similar to that of *G. megregori* except the setae are somewhat shorter on this species, especially the dorsal setae. L₅ is nearly as long as the distance to L₄; M₅ is much shorter than D₅; M₆ is longer than the distance to L₄; S₅ is shorter than the associated lateral setae.

The primary parapodial scutum is much longer than the minute secondary. The ventrial scutum is elongate vase-shaped, smooth and not provided with preanal pores. There are two pairs of ventro-lateral interscutal setae. The peritreme is long, extending forward to D₄. Spermatheca as in figure 53.

**MALE:** Unknown.

**TYPE LOCALITY:** Female holotype from soopolallie (*Shepherdia canadensis* Nutt.) 8 miles west of Hedley along the Similkameen River on July 12, 1956, is number 6539 in the Canadian National Museum, Ottawa, Canada.

**REMARKS:** The above description, measurements and illustrations are based on the type. The figure of the ventrial scutum is reconstructed as this structure is tipped on the type.

**DIAGNOSIS:** The short dorsal setae, short M₃, long M₅ and long L₅ serve to distinguish this species from the closely related *G. megregori*. 
Galendromus (Menaseius) juniperoides DeLeon

Figures 52, 56, 62, 70, 74 and 79

Galendromus juniperoides DeLeon, 1962, Florida Entomologist 45(1): 15, fig. 23. (female and male)

FEMALES: The dorsal scutum is 0.34 to 0.37 mm. long, 0.20 to 0.21 mm. wide and distinctly reticulate and imbricate on the anterior three-fourths of its length; the posterior fourth is smooth, lightly ridged or very lightly reticulate. The dorsal setae, except for D1 and D0, are short and subequal in lengths; D1 is about 1 1/2 times the length of D0 and D0 is minute. The lateral setae are about 1 1/2 times the length of the dorsal setae and except for L3 and L4 are subequal; L6 is about the same length as the dorsal setae and about 3 times its length from L4; L5 is one-fourth longer than L4 and weakly plumose. M1 is subequal to D1 and M2 is slightly smaller than L4. S1 is subequal to the associated lateral setae.

There are two pairs of long slender metapodal scuta, the primary about three times as long as the secondary. The ventrial scutum is elongate and vane-shaped, smooth or indistinctly creased and not provided with preanal pores. There are two pairs of ventro-lateral interscutal setae. The peritreme is long, extending forward to D1. Spermatheca as in figure 52. There is a distinct macroseta on the fourth basitarsus.

MALE: The dorsal scutum is 0.28 mm. long and 0.17 mm. wide. The ventrial scutum is weakly creased and not provided with preanal pores. The spermatophore bearer is as in figure 79.

TYPE LOCALITY: Female holotype and male and female paratypes on Juniperus sp. at Huitu, Oax., Mexico, on February 1, 1957 (D. DeLeon) in the collection of D. DeLeon at Erwin, Tennessee.

REMARKS: This species is known only from the types recorded above.

DIAGNOSIS: Although this species superficially resembles G. juniperi, the elongate vane-shaped ventrial scutum, two pairs of ventro-lateral interscutal setae and the macroseta on the fourth basitarsus demonstrate a closer relationship with G. meyeri and G. flumens. It is readily distinguished from these two species by the extremely short dorsal and lateral setae.

Subgenus Leonodromus n. subgen.

The species of this subgenus have most of the lateral setae plumose, with most of the dorsal setae simple. The dorsal setae are much shorter than the lateral setae. The ventrial scutum is elongate and somewhat constricted laterally. Both of the two known species have no macrosetae on the base of the fourth tarsus.

The spermatheca is tubular, constricted just mesial of the atrium and provided with U-shaped refractive structure at the atrium. The spermatophore bearer of the type species is L-shaped with a spur at the heel and one on the lateral arm.

Type Species: Typhlodromus lustralis DeLeon, 1960.

KEY TO SPECIES OF SUBGENUS Leonodromus n. subgen.

1. L4 is simple and much shorter than M2; ventrial scutum with pores.................................................carinatus (DeLeon)
Lₙ plumose and subequal to Mₙ; ventrial scutum without pores

Galendromus (Leonodromus) luculentis (DeLeon)

Figures 80 to 87

Typhlodromus luculentis DeLeon, 1959, Florida Entomologist 42(3): 126, fig. 3. (female and male)

FEMALE HOLOTYPE: The dorsal scutum is 0.32 mm. long, 0.17 mm. wide and imbricate over most of its surface; the posterior declivity is weakly ridged. The dorsal setae, except for Dₙ, are less than one-half as long as the lateral setae. Dₙ is subequal to Lₙ and is plumose. The lateral setae are subequal and, although short, extend to or nearly to the base of the succeeding setae. Mₙ is subequal with Dₙ. Mₙ is plumose, and is subequal with and extends nearly to Lₙ. Sₙ is plumose and slightly longer than the associated laterals.

There are two pairs of metapodal scuta, the primary about three times the length of the secondary. The ventrial scutum is smooth, pentagonal with concave sides, and bears no preanal pores. There are three pairs of ventrolateral interscutal setae. The peritreme is long, extending forward to Lₙ. Spermatheca as in figure 86. There is no distinct macroseta on the fourth basitarsus.

MALE PARATYPE: The dorsal scutum is 0.27 mm. long and 0.16 mm. wide. The ventrial scutum is smooth and bears no preanal pores. The spermatophore bearer is as shown in figure 87.

TYPE LOCALITY: Female holotype and male paratype from Tuxtla Gutierrez, Chiapas, Mexico, on Guazuma tomentosa, January 11, 1957 (D. DeLeon) in the collection of D. DeLeon at Erwin, Tennessee.

REMARKS: This species is known only from the types recorded above.

DIAGNOSIS: This species is easily distinguished from C. carinulatus (DeLeon) by the subequal, plumose Mₙ and Lₙ and the absence of preanal pores on the ventrial scutum.

Galendromus (Leonodromus) carinulatus (DeLeon)

Figures 88 to 90

Typhlodromus carinulatus DeLeon, 1959, Florida Entomologist 42(3): 126, fig. 2. (female)

FEMALE HOLOTYPE: The dorsal scutum is 0.29 mm. long, 0.19 mm. wide and imbricate, reticulate or ridged over its entire surface. The dorsal setae, except for Dₙ, are minute, less than one-third the length of the laterals. Dₙ is plumose and slightly smaller than Lₙ. The lateral setae are plumose, except for Lₙ, and increase in size distinctly from Lₙ to Lₙ, with Lₙ 3 times the length of Lₙ; Lₙ is simple and less than one-fourth the
length of \( M_{1} \). \( M_{2} \) is minute and simple; \( M_{3} \) is plumose and only slightly smaller than \( L_{1} \). \( S_{1} \) is weakly plumose and slightly smaller than the associated laterals.

There are two pairs of metapodal scuta, the primary slightly more than three times the length of the secondary. The ventrial scutum is smooth or very lightly creased, elongate and lightly constricted in the anterior third of its length, widest in the anal region, and provided with a pair of distinct, ovate preanal pores that lie between and just posterior to the third pair of preanal setae. The peritremes is long, extending forward to \( D_{1} \). Spermatheca as shown in figure 90. There is no macroseta on the fourth basitarsus.

**Male:** Unknown.

**Type Locality:** Female holotype from *Pithecolobium lanceolatum* at La Tuna, Ver., Mexico, on February 5, 1957 (D. DeLeon) in the collection of D. DeLeon at Erwin, Tennessee.

**Remarks:** This species is known only from the type.

**Diagnosis:** The minute size of the dorsal setae, the small size of \( L_{1} \) and the presence of preanal pores on the ventrial scutum distinguish this species from *D. luculentis*.

**Literature Cited**


ADDENDUM

After this paper was sent to press I received separates of two publications that contained pertinent taxonomic and systematic data. These studies and the relevant information are discussed below.

González and Schuster (1962)* described a species of Galendromus from Chile as Metaseiulus brevicollis. This is the first record of the genus outside of North America. I have not seen specimens of this species but from the original description and illustrations it appears to be representative of the subgenus Menaseius as described above. The spermatheca, as illustrated, is somewhat atypical, however, and the species may belong to a previously unknown South American subgenus.

Schuster and Pritchard (1963) have synonymized Galendromus with Metaseiulus Muma, 1961, because the type species of the latter, Metaseiulus validus (Chant), 1957, as identified by them, possesses only 2 pairs of sternal setae rather than 3 as reported by Chant. To further support the synonymy, they state that most of the species placed by me in the genus Galendromus, 1961, vary in the occurrence of the posterior pair of preanal setae.

Although Schuster and Pritchard may be correct in their evaluation I am, for the present, maintaining Galendromus separately from Metaseiulus because of differences between Chant's description of M. validus and Schuster and Pritchard's description of the specimens they identify as M. validus. Further, only species of the typical subgenus of Galendromus exhibit common variation in the number of preanal setae. Species of the other subgenera consistently exhibit four pairs of preanal setae, whereas M. validus and the closely related Metaseiulus nelsoni Chant (1969) exhibit three pairs.

Two new species of the genus have been described by Schuster and Pritchard (1963).* Metaseiulus pomoides Schuster and Pritchard, 1963, is closely related to G. (M.) mexicanus, new species; it has a longer Ls, differently placed, smaller preanal, ventral pores and a shorter ventral scutum. Metaseiulus pinnatus Schuster and Pritchard, 1963, appears to belong in the subgenus Leonodromus on the basis of the form of the spermatheca but the dorsal setae are much longer than is typical.

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