

Some Mites Associated with Plants in the State of São Paulo, Brazil, with a List of Plant Mites of South America¹⁾

Shôzô Ehara

Zoological Institute, Faculty of Science, Hokkaido University

In general, the plant-inhabiting mite fauna of South America is little known. So far as the author is aware, thirty-two species of Tetranychidae, eleven of Tenuipalpidae, and twenty-four of Phytoseiidae are known from South America. From Brazil were recorded only three species belonging to these families prior to the present study.²⁾

The material on which this study is based was collected by Dr. Shôichi F. Sakagami, Dr. Yukio Akahira and Mr. C. Kyan from plants in Brazil in 1962 and 1963. This collection was mainly made from introduced plants in Rio Claro, State of São Paulo. In this paper fourteen species of mites, six phytophagous (Tetranychidae and Tenuipalpidae) and eight predatory (Phytoseiidae), are reported, as listed below.

Phytoseiidae³⁾

1. *Amblyseius sakagami* n. sp.
2. *Amblyseius hibisci* (Chant)
3. *Amblyseius largoensis* (Muma)
4. *Amblyseius neotropicus* n. sp.
5. *Amblyseius akahirai* n. sp.
6. *Phytoseiulus chanti* n. sp.
7. *Phytoseius (Pennaseius) mumai* n. sp.
8. *Iphiseius quadripilis* (Banks)

Tenuipalpidae

9. *Pentamerismus oregonensis* McGregor
10. *Brevipalpus phoenicis* (Geijskes)

1) Contribution No. 676 from the Zoological Institute, Faculty of Science, Hokkaido University, Sapporo, Japan.
2) A mite referred to *Tetranychus molestissimus* in von Ihering's book (1931) belongs to the Trombiculidae, not to plant-feeding mites (Pritchard and Baker, 1955).
3) As to the classification of phytoseiids, Schuster and Pritchard's system (1963) is generally followed in this paper.

Tetranychidae

11. *Eutetranychus schultzi* (Blanchard)
12. *Oligonychus ununguis* (Jacobi)
13. *Tetranychus desertorum* Banks
14. *Tetranychus urticae* Koch

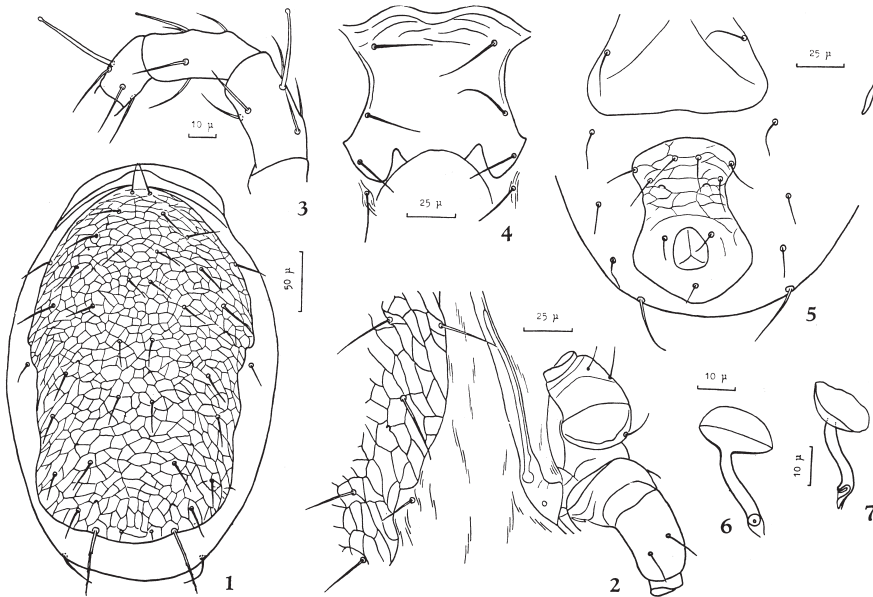
The holotypes of the new species are deposited in the Zoological Institute, Faculty of Science, Hokkaido University. In addition, the species of plant mites so far recorded from South America are listed in final pages of this paper.

Phytoseiidae

Amblyseius sakagamii n. sp.

(Figs. 1-7)

Female. Dorsal shield reticulate, with indented lateral margins; at least five pairs of pores; six pairs of dorsocentral setae. Setae on dorsal shield more or less similar in length except for longer L_4 and L_9 , and for shorter $D_6; L_9$ the longest, pectinate. Seta S_1 on dorsal shield, S_2 on interscutal membrane (rarely on dorsal shield). Peritreme short, reaching level of seta L_3 . Sternal shield with three pairs of setae; metasternal platelets oval. Ventrianal shield much longer than wide, widest at level of anus, narrower than genital shield; the anterior margin convex, the lateral margins concave. Ventrianal shield with nearly aligned, three pairs of preanal setae on anterior portion; two



Figs. 1-7. *Amblyseius sakagamii* n. sp., ♀. 1, dorsum of idiosoma. 2, showing peritreme and locations of setae S_1 and S_2 . 3, genu, tibia and basitarsus of leg IV. 4, sternal shield. 5, posterior ventral surface. 6, 7, spermatheca.

distinct pores behind and between posterior pair of preanals. Four pairs of setae surrounding ventrianal shield, VL₁ noticeably longer. A pair of slender metapodal platelets. Spermatheca with cervix cylindrical. Fixed digit of chelicera with a few (two distinct) subapical teeth; movable digit unidentate. Leg IV with spatulate macroseta on genu, tibia and basitarsus. Measurements in microns: idiosoma length 340, idiosoma width 200; lengths of setae: L₁ 23, L₂ 24, L₃ 28, L₄ 32, L₅ 23, L₆ 75, L₇ 23, L₈ 23, L₉ 53, M₁ 23, M₂ 27, D₁ 24, D₂ 21, D₃ 22, D₄ 24, D₅ 24, D₆ 8, S₁ 26, S₂ 17, VL₁ 27, macrosetae of leg IV: genual 29, tibial 20, basitarsal 31.

Male. Not known.

Holotype. ♀, Rio Claro, State of São Paulo, V or VI-1963 (Sh. F. Sakagami & Y. Akahira), on *Dombeya natalensis*. *Paratypes.* Nine ♀♀, data same as for holotype.

Remarks. *Amblyseius sakagami* n. sp. is similar to *A. scutalis* (Athias-Henriot) (Algeria), *A. delhiensis* (Narayanan & Kaur) (India), and *A. sibelius* De Leon (Florida), but is different in the anterior pair of scapular setae set on dorsal shield from the species here enumerated. Further, this new species is distinguished from *A. scutalis* and *A. delhiensis* by relative lengths of the setae on dorsal shield, and from *A. sibelius* by the shape of ventrianal shield. In Japanese females of *A. finlandicus* (Oudemans) the anterior pair of scapular setae may occur on the dorsal shield or on the interscutal membrane. In the new species, however, the setae constantly occur on the dorsal shield. In addition, it is distinct from *A. finlandicus* in the spatulate macrosetae on leg IV; these setae of the latter are tapering. This species is named in honor of Dr. Shôichi F. Sakagami.

Amblyseius hibisci (Chant)

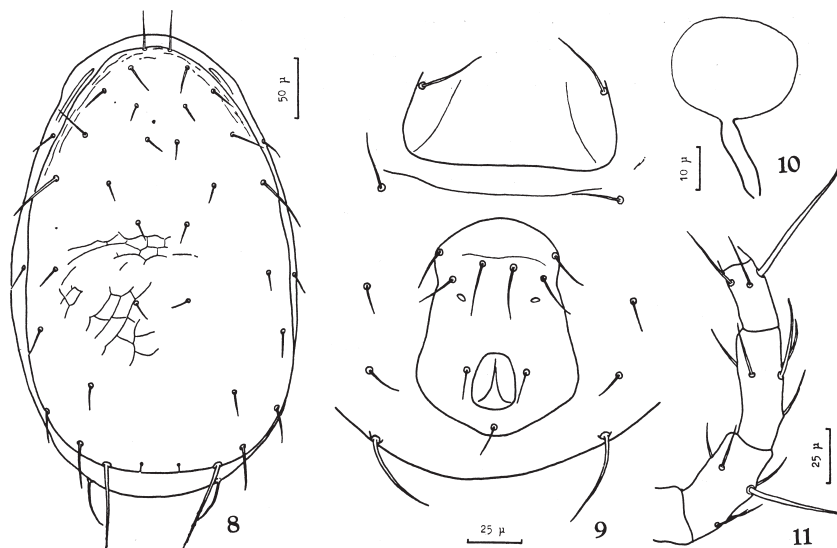
(Figs. 8-11)

Typhlodromus (Amblyseius) hibisci Chant, 1960, p. 68, Figs. 100, 101.

Amblyseius (Typhlodromalus) hibisci, Muma, 1961a, p. 288.

Amblyseius hibisci, Schuster & Pritchard, 1963, p. 228, Fig. 21.

Female. Dorsal shield faintly reticulate, with six pairs of dorsocentral setae. Setae on dorsal shield dissimilar in length: L₉ the longest, weakly pectinate; L₄>D₁=L₁=L₃>L₂; L₆>L₅; L₈>L₇>M₂. Setae S₁ and S₂ on interscutal membrane. Peritreme extending approximately to seta L₁. Sternal shield with three pairs of setae; metasternal platelets elongate oval. Ventrianal shield longer than wide, widest at level of anus, narrower than genital shield; the anterior margin convex, the lateral margins concave. Three pairs of preanal setae on ventrianal shield more or less in a line; a pair of crescentic pores behind and between posterior pair of preanals. Four pairs of setae surrounding ventrianal shield, VL₁ noticeably longer. Spermatheca with cervix subcylindrical. Chelicera impossible to examine because of positions of specimens. Leg IV with three blunt-ended macrosetae. Measurements in microns: idiosoma



Figs. 8-11. *Amblyseius hibisci*, ♀. 8, dorsum of idiosoma. 9, posterior ventral surface. 10, spermatheca. 11, genu, tibia and basitarsus of leg IV.

length 380, idiosoma width 250; lengths of setae: L_1 29, L_2 23, L_3 28, L_4 44, L_5 16, L_6 22, L_7 25, L_8 32, L_9 68, M_1 15, M_2 20, D_1 29, D_2 15, D_3 16, D_4 16, D_5 17, D_6 7, S_1 21, S_2 16, VL_1 22, macrosetae of leg IV: genual 41, tibial 34, basitarsal 55.

Male. Not available to the author.

Specimens examined. Three ♀♀, R. C., S. P., 16-VIII-1962 (Sh. F. S. & Y. A.), on *Musa sapientium* L. (banana nanica).

Distribution. Brazil (new record), Guatemala, Mexico, California, Florida.

Remarks. The present specimens generally accord with California specimens, rather than Mexican ones. (The author has examined some California specimens presented by González-Rodríguez and Schuster.)

Amblyseius largoensis (Muma)

Amblyseiopsis largoensis Muma, 1955, p. 266, Figs. 10-12; Garman, 1958, p. 76, Fig. 8.

Amblyseius largoensis, Ehara, 1959, p. 293, Figs. 17-18; Schuster & Pritchard, 1963, p. 237, Fig. 26; Collyer, 1964, p. 632.

Typhlodromus (Amblyseius) largoensis, Chant, 1960, p. 96, Figs. 226, 227; Swirski & Shechter, 1961, p. 98; Swirski & Amitai, 1961, p. 196.

Amblyseius (Amblyseialus) largoensis, Muma, 1961a, p. 287.

Specimens examined. Five ♀♀, R. C., S. P., 19-V-1963 (Sh. F. S. & Y. A.), on *Pterodon* sp.

Distribution. Brazil (new record), Guatemala, Mexico, California, Florida,

Japan, Hong Kong, New Zealand.

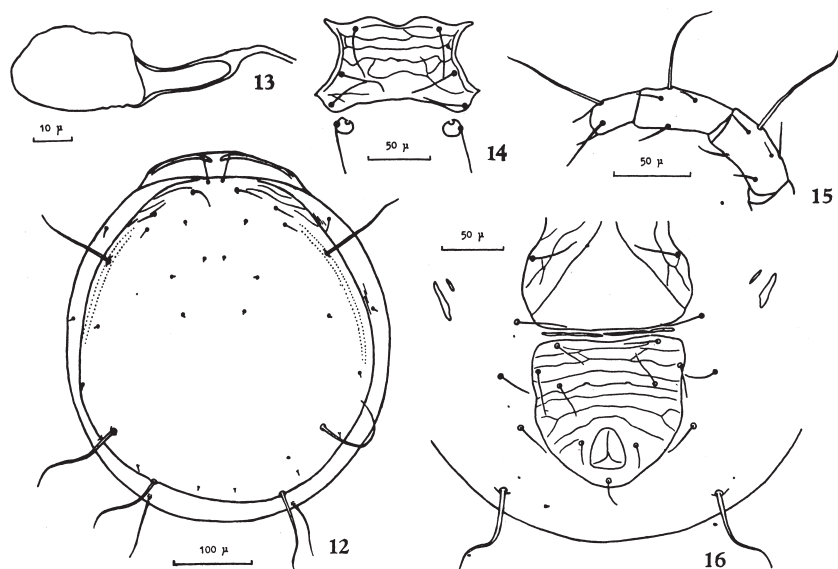
Remarks. Females of this species are characterized by the very long setae L_4 , L_9 and M_2 , and by the vase-shaped ventrianal shield.

Biology. In 1960 this mite was artificially imported from Hong Kong to Israel and in the next year it was recovered about one mile apart from the point of release (Swirski and Amitai, 1961). According to these authors, this mite was well bred on *Tetranychus cinnabarinus* (Boisduval)⁴ in laboratory.

Amblyseius neotropicus n. sp.

(Figs. 12-16)

Female. Body heavily sclerotized. Dorsal shield rugose in anterior periphery, with five pairs of dorsocentral setae. Setae on dorsal shield: M_2 and L_9 very long, with fine barbs, L_4 very long, without visible barbs ($M_2 > L_4 \geq L_9$); D_1 , L_1 , L_2 , and L_3 small ($D_1 = L_1 > L_2 > L_3$); remaining setae minute. Setae S_1 and S_2 on interscutal membrane. Peritreme extending beyond seta D_1 . Sternal shield well defined, much wider than long, with three pairs of setae; metasternal platelets subcircular, notched. Ventrianal shield as wide as long, approximately as wide as genital shield, with three pairs of preanal setae; a pair of pores being in line with posterior preanals. A few elongate, sclerotized plates on membrane between ventrianal and genital shields; the plates irregular



Figs. 12-16. *Amblyseius neotropicus* n. sp., ♀. 12, dorsum of idiosoma. 13, spermatheca. 14, sternal shield. 15, genu, tibia and basitarsus of leg IV. 16, posterior ventral surface.

4) Currently called "*Tetranychus telarius* (Linnaeus)."

in shape and number, connected with one another. Four pairs of setae surrounding ventrianal shield, VL₁ very long. Two pairs of slender metapodal platelets, the posterior pair noticeably larger. Spermatheca with cervix long and wide. Chelicera impossible to examine because of positions of specimens. Leg IV with lanceolate macroseta on genu, tibia and basitarsus. Measurements in microns: idiosoma length 440, idiosoma width 390; lengths of setae: L₁ 32, L₂ 22, L₃ 17, L₄ 106, L₅ 94, M₂ 112, D₁ 32, D₆ 4, L₅-L₈ 6-7, D₂-D₄, M₁ 4-5, S₁ 15, S₂ 9, VL₁ 78, macrosetae of leg IV: genual 74, tibial 59, basitarsal 66.

Male. Not known.

Holotype. ♀, R. C., S. P., 14-IV-1963 (Sh. F. S. & Y. A.), on unidentified plant. *Paratype.* One ♀, data same as for holotype.

Remarks. *Amblyseius neotropicus* n. sp. closely resembles *A. ovatus* (Garnan) (Ecuador and U.S.A.) and *A. rosellus* (Chant) (Virgin Is., West Indies), but differs from them in the relative lengths of the setae on dorsal shield. This species is also similar to *A. iphiformis*⁵⁾ (Muma) (Florida), but is different at least in the dissimilarity of two pairs of metapodal platelets.

Amblyseius akahirai n. sp.

(Figs. 17-21)

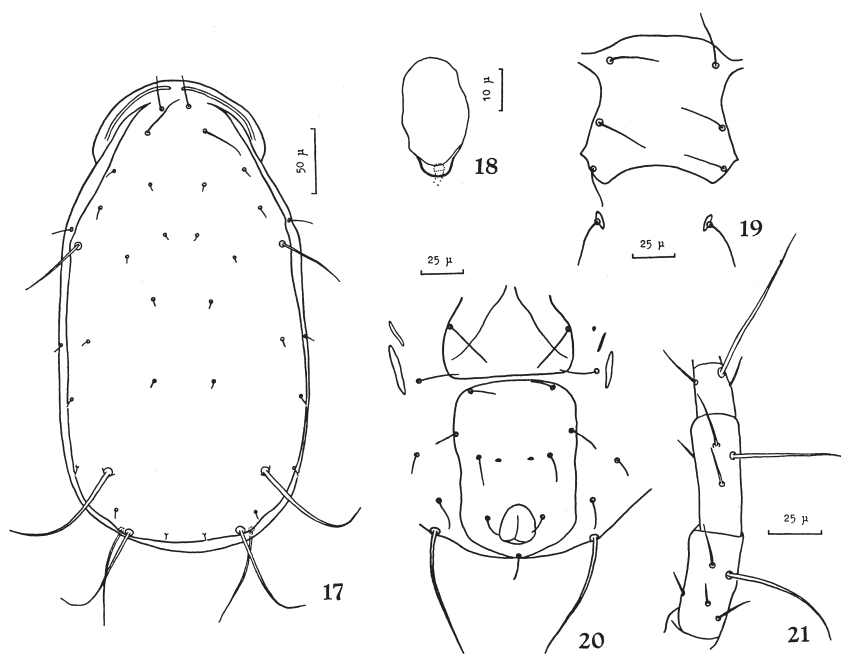
Female. Dorsal shield smooth, with six pairs of dorsocentral setae. Setae on dorsal shield: setae L₉ and M₂ very long, with fine barbs, seta L₄ very long, without visible barbs (L₉=M₂>L₄): setae D₁ and L₁ long (L₁>D₁); remaining setae minute to small (L₂=L₃; L₆>L₅). Setae S₁ and S₂ on interscutal membrane. Peritreme extending beyond seta D₁. Sternal shield as long as wide, with three pairs of setae; metasternal platelets slender. Ventrianal shield much longer than wide, about as wide as genital shield, with lateral margins parallel. Three pairs of preanal setae on ventrianal shield, a pair of pores between and only slightly behind posterior pair of preanals. Four pairs of setae surrounding ventrianal shield, VL₁ very long. Two pairs of slender metapodal platelets, the posterior pair much larger. Spermatheca with cervix short and wide. Fixed digit of chelicera with at least eight teeth. Leg IV with attenuate macroseta on genu, tibia and basitarsus. Measurements in microns: idiosoma length 350, idiosoma width 190; lengths of setae: L₁ 35, L₂, L₃ 9, L₄ 48, L₅ 6, L₆-L₈ 9, L₉ 80, M₁ 5, M₂ 82, D₁ 24, D₂, D₃ 5, D₄, D₅ 6, D₆ 5, S₁ 20, S₂ 8, VL₁ 75, macrosetae of leg IV: genual 58, tibial 51, basitarsal 73.

Male. Not known.

Holotype. ♀, R. C., S. P., 24-VI-1963 (Sh. F. S. & Y. A.), on *Sapindus saponaria* L. (saboneteiro).

Remarks. *Amblyseius akahirai* n. sp. bears a resemblance to *A. similis* (Koch), *A. jucundus* (Chant), *A. robiniae* (Chant), *A. simplicissimus* (De Leon), *A. arbuti* De Leon, and *A. montanus* Wainstein. It is, however, dis-

5) New combination, originally described as *Amblyseiulus iphiformis*.



Figs. 17-21. *Amblyseius akahirai* n. sp., ♀. 17, dorsum of idiosoma. 18, spermatheca. 19, sternal shield. 20, posterior ventral surface. 21, genu, tibia and basitarsus of leg IV.

tinguished from them by the relative lengths of setae L_2 and L_3 , or of setae L_9 and M_2 . This species is named in honor of Dr. Yukio Akahira.

Phytoseiulus chanti n. sp.

(Figs. 22-26)

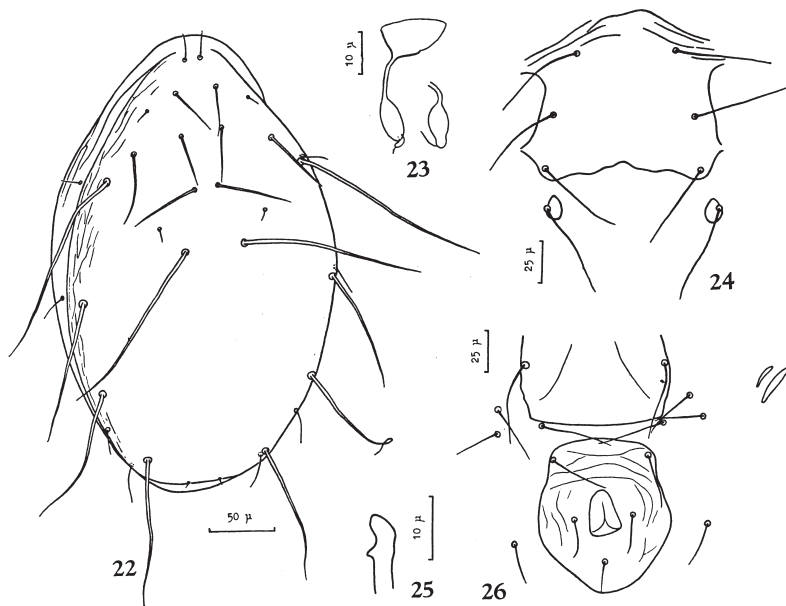
Female. Dorsal shield rugose in periphery, with five pairs of dorsocentral setae. Setae on dorsal shield: L_4 , L_5 , L_7 , M_2 , and D_4 very long, L_1 , L_3 , D_2 , and D_3 long, remainder setae small or minute; longer setae plumose. Setae S_1 and S_2 on interscutal membrane. Peritreme short, reaching or slightly surpassing level of seta L_3 . Sternal shield with three pairs of setae. Ventrianal shield oval, widest at level of anus, narrower than genital shield; a pair of preanal setae near the anterior margin, no pores. Four pairs of setae surrounding ventrianal shield, none greatly longer than others; the anterior three pairs adjacent, not aligned. Two pairs of slender metapodal platelets, the caudal pair much larger. Spermatheca as figured. Chelicera impossible to examine because of positions of specimens. Legs very long; genu IV and basitarsus IV each with an attenuate, plumose macroseta. Measurements in microns: idiosoma length 340, idiosoma width 210; lengths of setae: L_1 36, L_2 11, L_3 51, L_4 154, L_5 100, L_8 25, L_9 106, M_1 11, M_2 122, D_1 22, D_2 40, D_3 58, D_4 135, D_6 5, S_1 19,

S_2 23, VL_1 29, macrosetae of leg IV: genual 83, basitarsal 109; longest seta on tibia IV 38.

Male. Dorsal chaetotaxy similar to that in female. Peritreme reaching only to level of seta L_4 . Ventrianal shield broadly triangular, with three pairs of preanal setae. Movable digit of chelicera with spermatophoral process similar to that in other species of this genus. Leg IV noticeably longer than legs II and III; macrosetae on leg IV similar to those of female. Measurements in microns: idiosoma length 290, idiosoma width 200; lengths⁶⁾ of legs: I 470, II 350, III 370, IV 530; lengths of setae: L_4 116, L_5 84, L_9 87, M_2 101, D_4 93, macrosetae of leg IV: genual 61, basitarsal 75; longest seta on tibia IV 30.

Holotype. ♀, R. C., S. P., 24-VI-1963 (Sh. F. S. & Y. A.), on *Sapindus saponaria* L. (saboneteiro). *Paratypes.* Two ♂♂, data same as for holotype; 1♀, R. C., S. P., 14-IV-1963 (Sh. F. S. & Y. A.), on unidentified plant.

Remarks. *Phytoseiulus chanti* n. sp. closely resembles *P. macropilis* (Banks), but female of the former differs from this sex of the latter in having much shorter peritremes; the peritremes of female of *P. macropilis* extend to the level of seta L_1 . (The author has examined Florida specimens of *P. macropilis*.) *P. chanti* n. sp. may be similar to *P. tardi* (Lombardini)⁷⁾ (Sicily), but



Figs. 22-26. *Phytoseiulus chanti* n. sp. 22, dorsum of idiosoma, ♀. 23, spermatheca. 24, sternal shield, ♀. 25, spermatophoral process of chelicera, ♂. 26, posterior ventral surface, ♀.

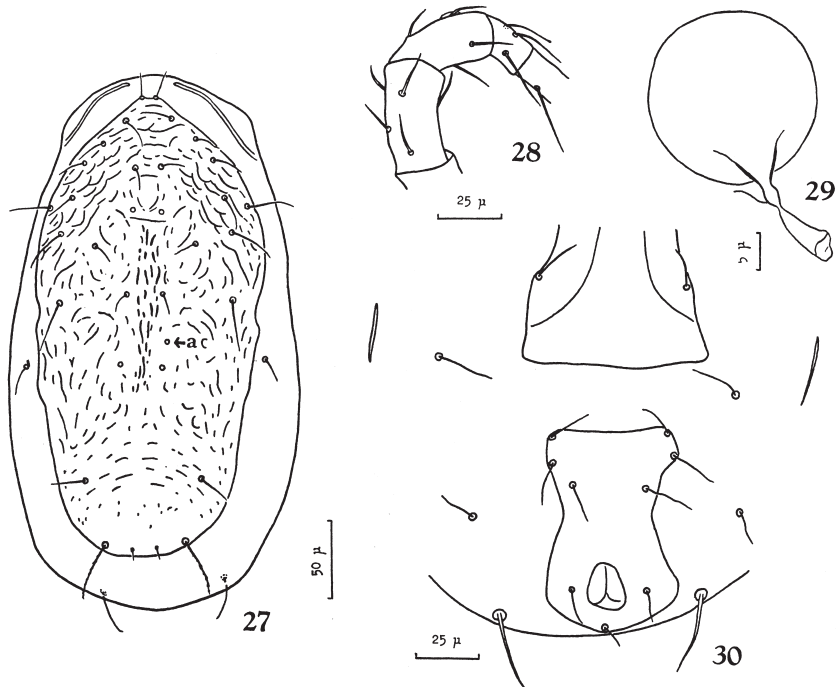
6) Excluding pretarsus and coxa.

7) New combination, originally described as *Amblyseius tardi*.

males of the two species are separated by the relative lengths of the setae on the dorsal shield. The new species is named in honor of Dr. D. A. Chant.

Phytoseius (Pennaseius) mumai n. sp.
(Figs. 27-30)

Female. Dorsal shield coarsely sculptured, with six pairs of dorsocentral setae. Setae of dorsal shield dissimilar in length, relative lengths of longer setae: $L_{10} > L_6 > L_5 > S_1$; L_{10} pectinate, L_{10} and M_2 more distant than usual. Peritreme reaching not in front of base of seta D_1 . Sternal shield about as wide as long, with three pairs of setae. Ventrianal shield slender, the anterior



Figs. 27-30. *Phytoseius (Pennaseius) mumai* n. sp., ♀. 27, dorsum of idiosoma (a: aberrantly additional dorsocentral seta). 28, genu, tibia and basitarsus of leg IV. 29, spermatheca. 30, posterior ventral surface.

margin nearly straight, the lateral margins concave; three pairs of ventrianal setae; no pores. Three pairs of setae surrounding ventrianal shield, the seta VL_1 stouter. A pair of very slender metapodal platelets. Spermatheca with cervix short and wide. Chelicera impossible to examine because of position of specimen. Leg IV without macrosetae, basitarsus IV with a slightly spatulate seta. Measurements in microns: idiosoma length 340, idiosoma width 180; lengths of setae: L_1 20, L_2 16, L_3 20, L_4 21, L_5 28, L_6 32, L_{10} 36, M_1 , D_2 , D_4 14-15, D_3 , D_5 missing, D_6 8, S_1 25, S_2 18, VL_1 27, spatulate seta on basitarsus IV 19.

Male. Not known.

Holotype. ♀, R. C., S. P., 16-VIII-1962 (Sh. F. S. & Y. A.), on *Musa sapientium* L. (banana nanica).

Remarks. The setae D_3 and D_5 of the holotype are missing, but are supposedly similar in length to D_2 and D_4 . In addition, the holotype has an aberrantly additional dorsocentral seta (a in Fig. 27) between setae D_4 and D_5 on one side. This new species appears to be related to *Phytoseius* (*Pennaseius*) *decoratus* González-Rodríguez & Schuster (Chile) in the distant interval between setae M_2 and L_{10} , but the two species differ in relative lengths of dorsal setae and in number of ventrianal setae. This species is named in honor of Dr. Martin H. Muma.

Iphiseius quadripilis (Banks)
(Figs. 31-37)

Seius quadripilis Banks, 1905, p. 138.

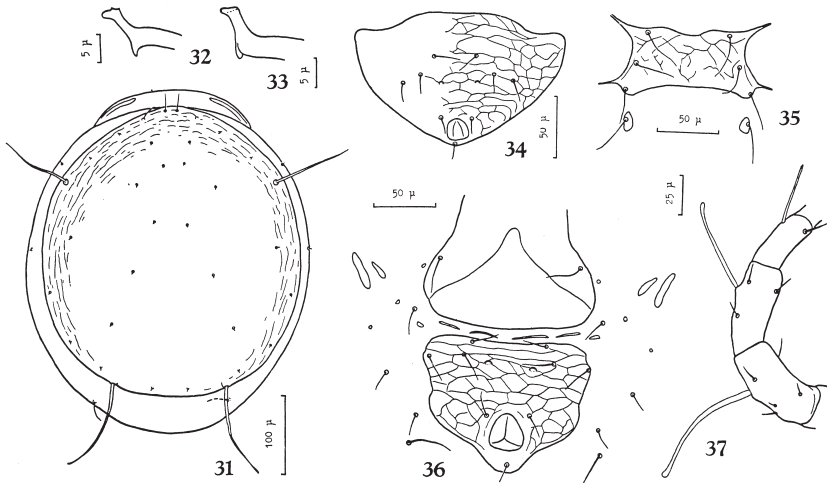
"*Amblyseius*" *quadripilis*, Cunliffe & Baker, 1953, p. 26, Figs.

Amblyseius quadripilis, Muma, 1955, p. 263, Figs. 1-3; Garman, 1958, p. 71, Fig. 2.

Iphiseius quadripilis, Chant, 1960, p. 110, Figs. 261, 262.

Amblyseius (*Iphiseius*) *quadripilis*, Muma, 1961a, p. 288.

Female. Body heavily sclerotized. Dorsal shield rugose in periphery, with six pairs of dorsocentral setae. Setae on dorsal shield: L_4 and L_9 very long, the latter dilated distally, blunt-ended; D_1 and L_1 long; remaining setae minute. Setae S_1 and S_2 on interscutal membrane, minute. Peritreme extending not in front of base of seta D_1 . Sternal shield much wider than long, with three



Figs. 31-37. *Iphiseius quadripilis*. 31, dorsum of idiosoma, ♀. 32, 33, spermatophoral process of chelicera, ♂. 34, ventrianal shield, ♂. 35, sternal shield, ♀. 36, posterior ventral surface, ♀. 37, genu, tibia and basitarsus of leg IV, ♀.

pairs of setae; metasternal platelets as figured. Ventrianal shield approximately triangular, wider than long, about as wide as genital shield. Three pairs of preanal setae on ventrianal shield, two distinct pores between and slightly behind middle pair of preanals. Two pairs of elongate, sclerotized plates on membrane between ventrianal and genital shields. Four pairs of setae surrounding ventrianal shield, VL₁ longer. Two pairs of slender metapodal platelets, the outer pair much larger. Spermatheca impossible to examine because of positions of specimens. Fixed digit of chelicera multidentate. Genu IV and tibia IV each with macroseta subcapitate; basitarsus IV with macroseta weakly spatulate. Measurements in microns: idiosoma length 410, idiosoma width 340, lengths of setae: L₁ 20, L₄ 94, L₉ 109, L₂, L₃, L₅-L₈, M₁, M₂ 2-4, D₁ 21, D₂-D₆ 2-4, S₁, S₂ 2-4, VL₁ 32, macrosetae of leg IV: genual 80, tibial 58, basitarsal 39.

Male. Dorsal chaetotactic pattern similar in female. Ventrianal shield broadly triangular, with three pairs of preanal setae. Movable digit of chelicera with spermatophoral process as figured. Macrosetae on leg IV similar to those in female. Measurements in microns: idiosoma length 290, idiosoma width 230; lengths of setae: L₄ 73, L₉ 70, macrosetae of leg IV: genual 55, tibial 48, tarsal 38.

Specimens examined. One ♀, 16-VIII-1962, on *Citrus* sp. (laranja), 1 ♀ & 1 ♂, 19-V-1963, on *Pterodon* sp., 2 ♀♀ & 1 ♂, 14-IV-1963, on unidentified plant, all collected in R. C., S. P., by Sh. F. S. & Y. A. (The author has examined Florida specimens of this mite.)

Distribution. Brazil (new record), Mexico, the West Indies, Florida.

Biology. According to Muma (1955, 1961b), this mite feeds on scale insect eggs and crawlers as well as on citrus red mite eggs in Florida.

Tenuipalpidae

Pentamerismus oregonensis McGregor

Pentamerismus oregonensis McGregor, 1949, p. 27, Fig. 9.

Specimens examined. Thirteen ♀♀, R. C., S. P., 26-IX-1962 (Sh. F. S. & Y. A.), on *Cupressus lusitanica* Mill. (cipreste).

Distribution and hosts. Brazil (new record), Florida, California, Oregon, Washington, Japan, Georgian S.S.R. On *Cupressus*, *Libocedrus*, *Juniperus*, *Thuja*.

Remarks. Females of *Pentamerismus oregonensis* are characterized by the six pairs of moderately lanceolate, serrate dorsolateral hysterosomals among members of this genus. Redescriptions of this mite were presented by Pritchard and Baker (1952) and by Ehara (1962).

Brevipalpus phoenicis (Geijskes)

Tenuipalpus phoenicis Geijskes, 1939, p. 230, Fig. 7.

Specimens examined. Two ♀♀, 16-VIII-1962, on *Musa sapientium* L. (banana nanica)⁸⁾, 1 ♀, 28-IX-1962, on *Terminalia cattappa* L. (chapéu de sol)⁹⁾, 4 ♀♀, 14-IV-1963, on undetermined host, 18 ♀♀ & 1 ♂, 24-VI-1963, on *Caesalpinia gardneriana* Benth (catingueira)¹⁰⁾, 2 ♀♀, 26-VI-1963, on *Annona* sp. (fruta do conde), all collected in R. C., S. P., by Sh. F. S. & Y. A.

Distribution and hosts. Brazil, Argentina, Trinidad, Cuba, U.S.A., Europe, Turkey, Georgian S.S.R., Africa, India, Malaya, Philippines, Formosa, Hawaii. The plant host list is very large.

Remarks. Females of this mite are easily distinguished by having two sensory rods on tarsus II from other *Brevipalpus* females bearing five pairs of dorsolateral hysterosomal setae. This mite was redescribed in detail by Pritchard and Baker (1952). It is well known as a pest of citrus in Brazil (cf. Carmona, 1962; Rosillo et al., 1964).

Tetranychidae

Eutetranychus schultzi (Blanchard)

(Figs. 38-45)

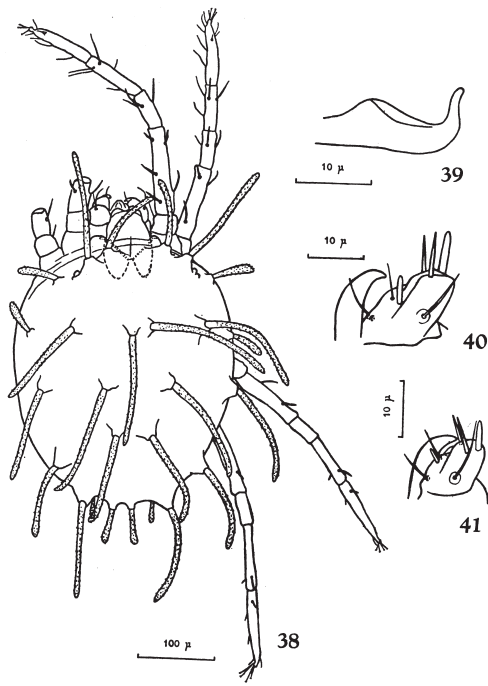
Anychus schultzi Blanchard, 1940, p. 24, Fig. 3.

Eutetranychus schultzi, Pritchard & Baker, 1955, p. 115, Figs. 87-89.

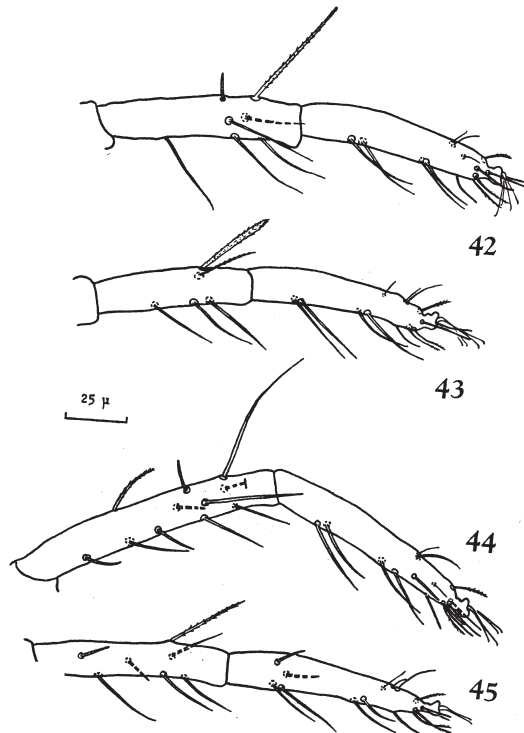
Female. Dorsum of idiosoma faintly striate. Setae on dorsum set on strong tubercles, slightly dilated near tip, bluntly ended; third dorsal propodosomal, humeral, outer sacral and clunal setae all noticeably shorter than remainder dorsal setae, often spatulate. Peritreme slightly enlarged at distal end. Medioventral opisthosomal setae slender. Genital flap with transverse striae; area immediately anterior to flap with transverse striae. Stylophore with a distal protuberance on dorsum, ratio of length to breadth of stylophore 6.7:10. Terminal sensillum of palpus slender; dorsal sensillum shorter, slender. Legs slender. Tarsus I with a set of short duplex setae; four tactile setae proximal to duplex setae; four tactile and four sensory setae distal to duplex setae; tibia I with six tactile and one sensory setae. Tarsus II with five tactile setae proximal to duplex setae; three tactile and three sensory setae distal to duplex setae; tibia II with five tactile setae. Tarsi III and IV each with eight tactile and one sensory setae; tibiae III and IV each with four tactile setae. Body length 380 μ (including rostrum), body width 260 μ .

Male. Aedeagus nearly perpendicularly bent upward and tapering to form a sigmoid distal portion; the tip dorsocaudally directed. Tarsus I with four

8), 9), 10) New host record.



Figs. 38-41. *Eutetranychus schultzi*.
38, dorsum of body, ♀. 39, aedeagus.
40, distal segment of palpus, ♀. 41,
distal segment of palpus, ♂.



Figs. 42-45. *Eutetranychus schultzi*,
tibiae and tarsi of legs. 42, leg I, ♀.
43, leg II, ♀. 44, leg I, ♂. 45, leg
II, ♂.

tactile setae proximal to duplex setae; a sensory seta at level of duplex setae; four tactile and four sensory setae distal to duplex setae; tibia I with seven tactile and four sensory setae. Tarsus II with five tactile and two sensory setae proximal to duplex setae; three tactile and three sensory setae distal to duplex setae; tibia II with five tactile and two sensory setae. Body length 350μ (including rostrum).

Specimens examined. Thirteen ♀♀ & 1 ♂, R. C., S. P., 27-V-1963 (Sh. F. S. & Y. A.), on *Strelitzia angusta* Thunb. (estrelizia).

Distribution and hosts. Brazil (new record), on *Strelitzia* (new record); Argentina, on *Ricinus*.

Remarks. So far as the present material is concerned, there exists a good deal of variation in length and shape of the dorsal setae.

Oligonychus ununguis (Jacobi)

(Figs. 49-51)

Tetranychus ununguis Jacobi, 1905, p. 239.

Specimens examined. Twenty-two ♀♀ & 7 ♂♂, R. C., S. P., 27-IX-1962 (Sh. F. S. & Y. A.), on *Cupressus lusitanica* Mill. (cipreste).

Distribution and hosts. Holarctic species, on various conifers, fagaceous plants, walnut¹¹⁾, maple¹²⁾; Brazil (new record).

Remarks. *Oligonychus ununguis* is distinguished from other members of this genus by having the long dorsal idiosomal setae and a single ventral tactile seta at the level of duplex setae of tarsus I. This species was re-described by recent authors (McGregor, 1950; Pritchard & Baker, 1955; Wainstein, 1960; Ehara, 1962; Rota, 1962; Reeves, 1963). In the Brazilian specimens, terminal sensillum of female palpus is more slender than that of holarctic females. Biology of this mite was studied by Garman (1923), Cunniffe & Ryle (1923), Ryle (1925), and Scheller (1962). This mite was possibly imported to Brazil.

Tetranychus desertorum Banks

(Fig. 46)

Tetranychus desertorum Banks, 1900, p. 76, Fig. 14.

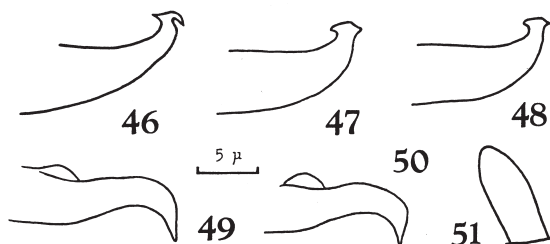
Specimens examined. Five ♀♀ & 2 ♂♂, R. C., S. P., 14-IV-1963 (Sh. F. S. & Y. A.), on unidentified plant.

Distribution and hosts. Brazil (new record), Argentina, Chile, Peru, Nicaragua, Mexico, Puerto Rico, U.S.A., South Africa, Japan. The plant host list is very large.

Remarks. *Tetranychus desertorum* is characterized by the position of

11), 12) McGregor (1950) noted walnut and maple as hosts of this mite.

proximal duplex setae on tarsus I which are located more or less in a line with four tactile setae, and also by the peculiar shape of male aedeagus. *T. desertorum* is of economic importance in many parts of the world. Information on this mite can be referred to Pritchard and Baker (1955).



Figs. 46-50. Aedeagi. 46, *Tetranychus desertorum*. 47, 48, *T. urticae*. 49, 50, *Oligonychus ununguis*. **Fig. 51.** Terminal sensillum of palpus of *O. ununguis*, ♀.

Tetranychus urticae Koch

(Figs. 47, 48)

Tetranychus urticae Koch, 1836, p. 10; Boudreaux & Dosse, 1963, p. 359.

Specimens examined. Eleven ♀♀ & 4 ♂♂, Suzano, S. P., 9-IX-1962 (C. Kyan), on *Fragaria* sp. (morangueiro).

Distribution and hosts. Brazil (new record), Argentina, Chile, North America, Europe, Africa, the Middle East, Japan, Australia, New Zealand. A wide variety of plants were recorded as hosts.

Remarks. The present materials of this species are unknown in color, because of alcoholic specimens. However, this identification has been made based on the shape of dorsal integumentary lobes on the idiosoma. Previously, this mite was generally called "*Tetranychus telarius* (Linnaeus)," but the name was recently changed into *urticae* Koch by Boudreaux and Dosse (1963). This mite, the two-spotted spider mite, is one of the most serious mite pests of agricultural crops in the world; its biology and control were studied by many investigators.

List of plant mites recorded from South America†, with type locality, and distribution records within S.A.

Phytoseiidae

1. *Evansoseius macfarlanei* Sheals, 1962 ("Lagune Sauce Grande," Argentina).—Argentina.
2. *Chileseius camposi* González-Rodríguez & Schuster, 1962 (Curicó, Chile).—Chile.

† Including Panama and Trinidad. The Eriophyiidae excluded.

3. *Neoseiulus transvaalensis* (Nesbitt, 1951) (Nylstroom, Transvaal).—Panama Canal Zone.
4. *Typhloseiopsis tropicus* (Chant, 1959) (Guailabamba, Ecuador).—Ecuador.
5. *Metaseiulus brevicollis* González-Rodríguez & Schuster, 1962 (Viña del Mar, Chile).—Chile.
6. *Amblyseius longispinosus* (Evans, 1952) (Indonesia).—South America (!).
7. *Amblyseius chilensis* (Dosse, 1958) (Chile).—Chile.
8. *Amblyseius chascomensis* (Sheals, 1962) ("Chascomus," Buenos Aires, Argentina).—Argentina.
9. *Amblyseius finlandicus* (Oudemans, 1915) (Åbo, Finland).—Argentina.
10. *Amblyseius concordis* (Chant, 1959) (Concordia, Entre Rios, Argentina).—Argentina.
11. *Amblyseius fructicolus* González-Rodríguez & Schuster, 1962 (Linderos, Santiago, Chile).—Chile.
- *12. *Amblyseius sakagamii* Ehara, n. sp. (Rio Claro, São Paulo, Brazil).—Brazil.
- *13. *Amblyseius hibisci* (Chant, 1959) (Alamos, Sonora, Mexico).—Brazil.
- *14. *Amblyseius largoensis* (Muma, 1955) (Key Largo, Florida).—Brazil.
15. *Amblyseius fraterculus* Berlese, 1917 (La Plata, Argentina).—Argentina.
16. *Amblyseius perlongisetus* Berlese, 1917 (La Plata, Argentina).—Argentina, Chile.
17. *Amblyseius ovatus* (Garman, 1958) [Ecuador (at Brownsville, Texas)].—Ecuador.
18. *Amblyseius tucumanensis* (Sheals, 1962) (Tucumán, Argentina).—Argentina.
19. *Amblyseius globosus* González-Rodríguez & Schuster, 1962 (Viña del Mar, Chile).—Chile.
20. *Amblyseius intermedius* González-Rodríguez & Schuster, 1962 (Viña del Mar, Chile).—Chile.
21. *Amblyseius valpoensis* González-Rodríguez & Schuster, 1962 (Viña del Mar, Chile).—Chile.
- *22. *Amblyseius neotropicus* Ehara, n. sp. (R. C., S. P., Brazil).—Brazil.
- *23. *Amblyseius akahirai* Ehara, n. sp. (R. C., S. P., Brazil).—Brazil.
24. *Amblyseius hexagonus* Berlese, 1917 (La Plata, Argentina).—Argentina.
25. *Asperoseius grandis* (Berlese, 1914) (La Plata, Argentina).—Argentina.
26. *Phytoseiulus macropilis* (Berlese, 1905) (Eustis, Florida).—Panama Canal Zone.
- *27. *Phytoseiulus chanti* Ehara, n. sp. (R. C., S. P., Brazil).—Brazil.
28. *Phytoseiulus riegeli* Dosse, 1958 (Chile).—Chile.
29. *Mesoseiulus longipes* (Evans, 1958) (Salisbury, Southern Rhodesia).—Chile.

* Species concerned in this paper.

30. *Phytoseius (Pennaseius) decoratus* González-Rodríguez & Schuster, 1962 (Pelarco, Talca, Chile).—Chile.
- *31. *Phytoseius (Pennaseius) mumai* Ehara, n. sp. (R. C., S. P., Brazil).—Brazil.
- *32. *Iphiseius quadripilis* (Banks, 1905) (Eustis, Florida).—Brazil.

Tenuipalpidae

1. *Pseudoleptus arechavaletae* Bruyant, 1911 (Uruguay).—Argentina, Uruguay.
- *2. *Pentamerismus oregonensis* McGregor, 1949 (Rhododendron, Oregon).—Brazil.
3. *Brevipalpus russulus* (Boisduval, 1867) (France).—Argentina, Peru.
4. *Brevipalpus trinidadensis* Baker, 1949 (St. Augustine, Trinidad).—Trinidad.
5. *Brevipalpus chilensis* Baker, 1949 (Chile).—Chile.
6. *Brevipalpus obovatus* Donnadieu, 1875 (France).—Argentina, Venezuela.
- *7. *Brevipalpus phoenicis* (Geijskes, 1939) (Haag, Holland).—Argentina, Brazil, Trinidad.
8. *Tenuipalpus heveae* Baker, 1945 (Belterra, Brazil).—Brazil.
9. *Tenuipalpus knorri* Baker & Pritchard, 1953 (Concordia, Argentina).—Argentina.
10. *Tenuipalpus pacificus* Baker, 1945 [Panama Canal Zone (at Hoboken, New Jersey)].—Panama.
11. *Dolichotetranychus vandergooti* (Oudemans, 1927) (Buitenzorg, Java).—Panama Canal Zone.
12. *Dolichotetranychus floridanus* (Banks, 1900) (Florida).—Panama.

Tetranychidae

1. *Bryobia arborea* Morgan & Anderson, 1957 (Summerland, British Columbia, Canada).—Chile.
2. *Bryobia praetiosa* Koch, 1836 (Germany).—South America (!).
3. *Eutetranychus banksi* (McGregor, 1914) (Orlando, Florida).—Argentina, Ecuador, Peru, Venezuela.
- *4. *Eutetranychus schultzi* (Blanchard, 1940) (Tucumán, Argentina).—Argentina, Brazil.
5. *Eutetranychus corderoi* Baker & Pritchard, 1962 (Turrialba, Costa Rica).—Peru.
6. *Panonychus ulmi* (Koch, 1836) (Regensburg, Germany).—Chile.
7. *Panonychus citri* (McGregor, 1916) (Orlando, Florida).—Argentina.
8. *Allonychus braziliensis* (McGregor, 1950) (Vicosá, Brazil).—Brazil.
9. *Allonychus littoralis* (McGregor, 1955) (Mocache, Ecuador).—Ecuador.
10. *Allonychus dorestei* Baker & Pritchard, 1962 (El Limón, Aragua, Venezuela).—Venezuela.

11. *Eotetranychus caribbeanae* (McGregor, 1950) (Loiza, Puerto Rico).—Ecuador.
12. *Eotetranychus planki* (McGregor, 1950) (Mayaguez, Puerto Rico).—Argentina, Ecuador, Trinidad.
13. *Eotetranychus tremae* De Leon, 1957 (Coral Gables, Florida).—Ecuador.
- *14. *Oligonychus ununguis* (Jacobi, 1905) (Dahlem, Germany).—Brazil.
15. *Oligonychus mangiferus* (Rahman & Sapra, 1940) (Lyallpur, India).—Peru.
16. *Oligonychus yothersi* (McGregor, 1914) (Orlando, Florida).—Argentina, Chile, Colombia, Ecuador.
17. *Oligonychus peronis* Pritchard & Baker, 1955 (Santo Domingo, Pichincha, Ecuador).—Ecuador.
18. *Oligonychus peruvianus* (McGregor, 1917) (La Legua, Peru).—Ecuador, Peru, Trinidad.
19. *Oligonychus zae* (McGregor, 1955) (Portoviejo, Ecuador).—Ecuador.
20. *Oligonychus gossypii* (Zacher, 1920) (Togo, Africa).—Ecuador.
- ?21. *Oligonychus mcgregori* (Baker & Pritchard, 1953) (Chinandega, Nicaragua).—Ecuador.
22. *Oligonychus annonicus* (McGregor, 1955) (Alajuela, Manabi, Ecuador).—Ecuador.
23. *Tetranychus abacae* Baker & Pritchard, 1962 (Bataan, Costa Rica).—Venezuela.
- *24. *Tetranychus desertorum* Banks, 1900 (Mesilla Park, New Mexico).—Argentina, Brazil, Chile, Peru.
25. *Tetranychus ludeni* Zacher, 1913 (St. Cloud near Paris, France).—Argentina, Chile.
26. *Tetranychus tumidus* Banks, 1900 (Eustis, Florida).—Panama Canal Zone.
27. *Tetranychus yusti* McGregor, 1955 (Portoviejo, Ecuador).—Ecuador.
28. *Tetranychus mexicanus* (McGregor, 1950) [Mexico (at Laredo, Texas)].—Argentina.
29. *Tetranychus cucurbitae* Rahman & Sapra, 1940 (Lyallpur, India).—South America (!).
30. *Tetranychus marianae* McGregor, 1950 (Mt. Lasso, Tinian Island, Mariana Group).—Argentina.
31. *Tetranychus neocaledonicus* Andréé, 1933 (New Caledonia).—Venezuela.
32. *Tetranychus telarius* (Linnaeus, 1758).—Argentina.
- *33. *Tetranychus urticae* Koch, 1836 (Regensburg, Germany).—Brazil, Chile.

Summary

Fourteen species belonging to the Phytoseiidae, Tenuipalpidae and Tetranychidae, collected from the State of São Paulo, Brazil, were described or recorded. The following new species of Phytoseiidae were described: *Amblyseius*

sakagami, *A. neotropicus*, *A. akahirai*, *Phytoseiulus chanti*, *Phytoseius* (*Penna-seius*) *mumai*. All other species except *Brevipalpus phoenicis* (Geijskes) are new to Brazil. In addition, species of the three families, so far recorded from South America, are listed.

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