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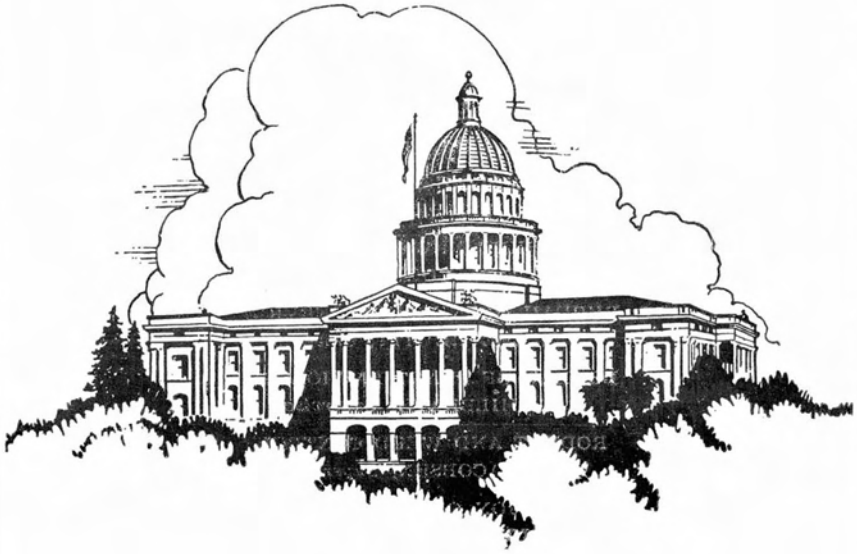

Sacramento, California : : : : : February, 1939

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ERIOPHYID STUDIES III

H. H. KEIFER, State Department of Agriculture, Sacramento

Eriophyid Studies II of this series was published in the Bulletin of the State Department of Agriculture, Vol. 27, No. 3, p. 301, September 7, 1938. The present installment lists 15 additional new species. This brings the total number of species figured in these articles to 49. Of this number 41 have been previously undescribed or unreported from California.

Phytoptus corniseminis Keifer, new species

Plate XXXIX

Female 170-185 microns long, 50 microns wide; wormlike, white. Rostrum moderately long, curved down. Shield 29 microns long, 35 microns wide, short, practically smooth, with a few side lines and tubercles; anterior setae 22 microns apart, 12 microns long. Dorsal tubercles 15.5 microns apart, ahead of rear margin, dorsal setae 14 microns long. Legs moderately stout. Forelegs 31 microns long, patella 5 microns long, patellar seta 22 microns long, tibia 6.5 microns long, tarsus 6.5 microns long, claw 6.75 microns long, featherclaw 5 rayed. Hindlegs 29 microns long, patella 4.5 microns long, patellar seta 17 microns long, tibia 5.5 microns long, tarsus 6.5 microns long, claw 8.5 microns long. Coxae with sternal ridge unforked; coxal setae III 35.5 microns long. Abdomen with rings microtuberculate except in the rear, slight ventrad ring reduction, 59-66 rings. Lateral seta above genital seta 19 microns long, on ring 9; subdorsal seta 28 microns long, on ring 12. First ventral seta 15 microns long, on ring 20; second ventral seta 15 microns long, on ring 33; third ventral seta 33 microns long, on ring 6 from rear; caudal seta 55-60 microns long; accessory seta present. Female genitalia 19 microns wide, 15 microns long, coverflap smooth, seta 13 microns long. Male 150-160 microns long, 45 microns wide. Male genitalia 17.5 microns wide, 12 microns long, seta 8.5 microns long.

Type slide of mites collected in seed-heads of *Cornus nuttalli* Aud. below Riverton, El Dorado County, August 24, 1938, by the writer. Two paratype slides bear the same data. As stated in the previous article, the genotype of *Phytoptus* DuJardin is *avellanae* Nalepa and in view of the extra setae on the shield and anterior part of the abdomen it was suggested that these could be advantageously used to separate the species possessing them from the large mass of *Eriophyes* species not with these characters. Thus the name *Phytoptus* is here resurrected. *Corniseminis* is similar to the genotype, *avellanae*, in possessing the frontolateral shield setae. Note the outside projection on the fore tibiae as in *Phytoptus pini* Nal. Note also the smooth female genital coverflap, the anterior apodeme and the glands.

Eriophyes emarginatae Keifer, new species

Plate XL

Female 240 microns long, 60 microns thick; form wormlike, color light yellow to amber. Rostrum quite short, curved down. Shield 42 microns long, 45 microns wide, smooth, dorsal tubercles 22.5 microns apart, dorsal setae 11 microns long, projecting dorsocentrad. Forelegs 44 microns long, patellar seta 34 microns long. Tibia 11 microns long, tarsus 10.5 microns long, claw 8.5 microns long, featherclaw 4 rayed. Hindlegs 41 microns long, patellar seta 10 microns long, tibia 8.5 microns long, tarsus 11 microns long, claw 8.5 microns long. Sternal ridge forked. Coxal setae III 42 microns long. Abdomen with about 60 smooth rings, these rings

* Issued in reprint form December 23, 1938. Numbers at the bottom in parentheses indicate pagination of the reprint.

showing a slight ventrad increase as a rule. Lateral seta a little behind genital seta, 24 microns long, on ring 8. First ventral seta 28 microns long, on ring 20; second ventral seta 17 microns long, on ring 36; third ventral seta 32 microns long, on ring 5 from rear; caudal seta 55 microns long; accessory seta present. Female genitalia 26 microns wide, 17 microns long, coverflap smooth, seta 18 microns long.

Male not seen.

Type slide of specimens from small finger-like upper surface leaf galls on *Prunus emarginata* (Dougl.) collected by D. B. Mackie about five miles west of Tragedy Springs at Maiden's Grave, Amador County, altitude 8000 feet, Sept. 18, 1938. Two paratype slides also bear this data. Specimens of this mite are on hand from this same area, dated Sept. 5, collected by Iris Savage. Other localities are: Camp Sacramento, El Dorado County, August 24, the collection made by the writer; and Fallen Leaf Lake, July 28, 1938, the collection made by the writer. There is some uncertainty as to the correct generic placement of this mite since typical species of *Eriophyes* usually have a ventrad reduction in ring number, while *emarginatae* has if anything a slight ventrad increase. The general facies of the species indicate *Eriophyes* as the proper genus. The absence of ring microtubercles, very short beak and type of leg segments are perhaps the more characteristic features of this species. The relationship of *Eriophyes emarginatae* to Eastern United States *Eriophyes* species on *Prunus* has not been determined.

Eriophyes savagei Keifer, new species

Plate XLI

Female 120-130 microns long, 35 microns thick; form short, wormlike; color white or light cream. Rostrum moderately short, somewhat downcurved. Shield 26 microns long, 33 microns wide, with obscure longitudinal lines in disc, the sides with curved lines and lines of tubercles. Dorsal tubercles 13.5 microns apart, dorsal setae 20 microns long, projecting anteriorly. Legs rather short and stout. Forelegs 26 microns long, patellar seta 25 microns long, tibia 6.5 microns long, tarsus 6.75 microns long, claw 6.75 microns long, featherclaw 4 rayed. Hindlegs 24 microns long, patellar seta 8.5 microns long, tibia 4.5 microns long, tarsus 6.75 microns long, claw 7.75 microns long. Anterior coxae touching at one point; coxal setae III 28 microns long. Abdomen with about 50 rings, considerable ventrad reduction; the microtubercles rounded dorsally, pointed ventrally. Lateral seta above the genital seta, 21 microns long, on ring 5. First ventral seta 24 microns long, on ring 17; second seta 8.5 microns long, on ring 28; third ventral seta 23 microns long, on ring 4 from rear; caudal seta 45 microns long; accessory seta present. Female genitalia 17.5 microns wide, 13 microns long, coverflap with about 10 ridges, seta 7 microns long.

Male 110 microns long, 30 microns thick. Male genitalia 15 microns wide, 13 microns long, seta 7 microns long.

Type slide of mites collected near Maiden's Grave (as *E. emarginatae*), but on the El Dorado County side of the road on Sept. 5, 1938. This species is found mixed with *E. emarginatae* in the *Prunus emarginata* (Dougl.) leaf finger-galls. It is believed this species is an inquilin since it does not appear in all the galls. I take pleasure in naming this mite for Mrs. Iris Savage, of the State Department of Agriculture, who has brought me many mites and who collected this species. Specimens are also on hand from this same area collected by D. B. Mackie, Sept. 18. The direction of the shield setae and the body tubercles are characters of particular note, also the small size of *savagei*.

Paraphytoptus salviacrinis Keifer, new species

Plate XLII

Female 125-140 microns long, 35 microns thick, wormlike, curved, light amber. Rostrum curved downward. Shield 25 microns long, 31 microns wide, gently

curved, the design of five central longitudinal lines and the sides of the shield heavily granulate; dorsal tubercles 17 microns apart, on rear shield margin; dorsal setae 16 microns long, projecting backward. Forelegs 22 microns long, patellar seta 14 microns long; tibia 4.5 microns long, tarsus 6.5 microns long, claw 6.75 microns long, attenuate, knobbed, featherclaw 5 rayed. Hindlegs 17.5 microns long, patellar seta 6.5 microns long, tibia 4 microns long, tarsus 4.5 microns long, claw 7.5 microns long. Coxae somewhat granulate, the anterior coxae connate; coxal setae III 26 microns long. Abdomen with sternites unevenly doubled behind the first lateral seta; the tergites gradually increasing in width on the anterior four-fifths; tergites about 47; sternites about 65. Lateral seta above genital seta, 21 microns long, on ring 9; first ventral seta 46 microns long, on ring 22; second ventral seta 12 microns long, on ring 39; third ventral seta 17 microns long, on ring 6 from rear; caudal seta 55 microns long, accessory seta present. Female genitalia 18 microns wide, 10 microns long, coverflap with about 12 ridges, seta 13 microns long.

Male 110-120 microns long, 30 microns thick. Male genitalia 19 microns wide, 11 microns long, seta 9 microns long.

Type slide, so designated, of mites taken from *Salvia apiana* Jepson by the writer at Riverside October 11, 1938. Five paratype slides bear this data. The mites are vagrants on the very hairy surface of the Salvia leaves and stems. This mite differs from *P. inaequalis* Keifer by having a different shield pattern, longer claws, and by having the sternites unevenly doubled to close behind the cephalothorax. This is the first mite of this genus to be recorded from a non-Composite host.

Phyllocoptes parviflori Keifer, new species

Plate XLIII

Female 170-180 microns long, 35.5 microns thick, form elongate-spindleform; color whitish. Rostrum projecting diagonally downward. Shield 35.5 microns long, 34 microns wide, subtriangular, projecting over rostrum base, design of two principal central longitudinal lines of dashes, the remainder lined with tubercles and short dashes; dorsal tubercles 17 microns apart, a little ahead of rear margin, dorsal setae 13.5 microns long, projecting caudo-centrad. Forelegs 30 microns long, patellar seta 16 microns long, tibia 6.75 microns long, tarsus 6.75 microns long, claw 9 microns long, featherclaw 5 rayed. Hindlegs 27 microns long, patellar seta 5 microns long, tibia 5 microns long, tarsus 6.5 microns long, claw 9.5 microns long. Coxal setae III 33 microns long. Abdomen entirely microtuberculate; tergites 65-70; sternites slightly more numerous. Lateral seta above genital seta, 9 microns long, on ring 9. First ventral seta 34 microns long, on ring 28; second ventral seta 11 microns long, on ring 46; third ventral seta 22 microns long, on ring 5 from rear; caudal seta 43 microns long, accessory seta present. Female genitalia 18 microns wide, 8 microns long, coverflap with 10 ridges; seta 14 microns long.

Male not seen.

Type slide of mites taken from the undersides of the leaves of *Rubus parviflorus* Nutt, Aug. 13, 1938, at Stinson Beach, Marin County, by the writer. One paratype slide bears this data. The mites are vagrants and apparently produce no leaf damage. In spite of the completely microtuberculate abdomen, with very little ventrad increase in rings, this species is placed in *Phyllocoptes* because of its habit, the shape of the shield, and its resemblance to *Phyllocoptes calirubi* Keifer.

Platyphytopus multisternatus Keifer, new species

Plate XLIV

Female 210 microns long, 60 microns wide, 45 microns thick; flat-spindleform; color yellow to amber. Rostrum rather large, bent down. Shield 51 microns long, 56 microns wide, with lines of microtubercles in a more or less definite pattern, the shield slightly lobed laterally; dorsal tubercles 18 microns apart, ahead of rear margin, dorsal setae 9 microns long, projecting dorsocentrally. Forelegs 35 microns long, patellar seta 27 microns long, tibia 8.5 microns long, tarsus 7.75 microns long, claw 8.5 microns long, knobbed, featherclaw 4 rayed. Hindlegs 33 microns long, patellar seta 6.5 microns long, tibia 7.75 microns long, tarsus 7.5 microns long, claw 8.5 microns long. Sternal line very short; coxal setae III 43 microns long. Abdomen flattened, faintly microtuberculate above, strongly so beneath; tergites 55-60; sternites 80-85. Lateral seta considerably ahead of genital seta, 17 microns long, on ring 6; first ventral seta 25 microns long, on ring 21; second ventral seta 45

microns long, on ring 49; third ventral seta 28 microns long, on ring 5 from rear; caudal seta 65 microns long, accessory seta present. Female genitalia 32 microns wide, 25 microns long, coverflap with about 16 ridges, seta 6.75 microns long.

Male 150-175 microns long, 50 microns wide. Male genitalia 20 microns wide, 16 microns long; seta 8.5 microns long.

Type slide of mites taken from *Pinus murrayana* Balfour, Lodgepole Pine, at Camp Sacramento, El Dorado County, August 24, 1938, by the writer. The altitude is about 6000 feet. Three paratype slides bear this data. Mites are also on hand from this host, taken by the writer at Fallen Leaf Lake, July 28, 1938. The new species immediately casts an entirely new light on the genus, *Platyphytoptus*, proving it to belong in the Phyllocoptinae. It further shows that *P. sabinianae*, the genotype, is a remarkable species, both in the numerical relation of the sternites to the tergites, and the genital coverflap. However, the sublateral furrow remains to clearly indicate the genus.

Platyphytoptus sabinianae Keifer, has been taken from *Pinus ponderosa* Dougl., at Camino, El Dorado County, August 24, 1938, and *Pinus tuberculata* Gord., Gold Run, Placer County, September 20, 1938. This species is a middle and low altitude form, whereas, *multisternatus* is confined to the higher levels.

The following genus is distinct from all others by possessing frontolateral shield setae, by lacking subdorsal abdominal setae, and by the pattern of ridges on the flattened tergites. I have the honor to name it for D. B. Mackie of the State Department of Agriculture who suggested that a search be made for Eriophyids on Date Palm.

Mackiella Keifer, new genus

Rostrum moderate in size, bent down. Shield flattened, a large lobe over the rostrum, the usual dorsal setae and a pair of frontolateral setae; legs with usual number of setae except foretibia which has a rear apical bristle. Abdomen with usual number of setae; tergites rather broad, flattened, with a more or less definite pattern of prominent short ridges except on posterior four; sternites with elongate microtubercles, the sternites convex and rising high on the sides to the flattened tergites, sternites about three times as numerous as the tergites.

Genotype as follows:

Mackiella phoenicis Keifer, new species

Plate XLV

Female 180 microns long, 40 microns wide, 35-40 microns thick, form wormlike, color light yellow to light amber. Rostrum bent down. Shield 40 microns long, 34 microns wide, flattened, a lobe over rostrum, smooth centrally, lined laterally, frontolateral setae 23 microns apart, 4.5 microns long; dorsal tubercles 21 microns apart, well ahead of rear margin, dorsal setae 9 microns long. Forelegs 34 microns long, patella 6.5 microns long, patellar seta 23 microns long; tibia 9 microns long, with a stout posterior bristle, tarsus 7.75 microns long, claw 8.75 microns long, tapering, featherclaw 7 rayed. Hindlegs 31 microns long, patella 5.5 microns long, patellar seta 15 microns long, laterally placed, tibia 6.75 microns long, tarsus 6.75 microns long, claw 8.75 microns long. Coxae somewhat elongate; anteriar coxae approximate; setae II and III in a transverse line; coxal setae III 34 microns long. Abdomen flattened above, cylindrical beneath, the last four tergites smooth above, sternites with elongate microtubercles; 17 tergites, 50-54 microtuberculate sternites; lateral seta above genital seta, 26 microns long, on ring 7; first ventral seta 19 microns long, on ring 16; second ventral seta 21 microns long, on ring 31; third ventral seta 42 microns long, on ring 4 from rear; caudal seta 44 microns long, accessory seta present. Female genitalia 23 microns wide, 12 microns long, coverflap smooth, seta 15 microns long.

Male 160 microns long, 35 microns wide, 30-35 microns thick. Male genitalia 15.5 microns wide, 11.5 microns long, seta 12 microns long.

Type slide, of mites collected from a folded center-leaf of an offshoot of Date Palm, *Phoenix dactylifera* L. at Indio, October 10, 1938,

by the writer. Two paratype slides bear this data. There is also one jar bearing preserved mites with this data. The mite, while a typical Phyllocoptine, is in habit like a bud-mite. No apparent injury was noted. The variety of date palm on which these mites were collected is Deglet Noor. Note that this mite has a stiff bristle from the rear side of the anterior tibia. It shares with *Platyphytoptus jonesi* Keifer the distinction of having extra shield setae and lacking extra abdominal setae.

Gammaphytoptus Keifer, new genus

Rostrum large, sloping forward and bent strongly down just above middle. Shield drawn out a short distance over rostrum base. Legs and coxae with usual setae, claw on the hindleg extra long; anterior coxae extending over on suboral plate. The sternal line obscured. Abdomen with usual setae; tergites about half as numerous as sternites and undulate, forming more or less regular rows of lobes; entire abdomen strongly microtuberculate. Genitalia situated between rear coxae which are unusually far apart; female genital coverflap lined.

Genotype as follows:

Gammaphytoptus camphorae Keifer, new species

Plate XLVI

Female 140-150 microns long, 50 microns thick, spindleform, whitish. Rostrum large, downcurved. Shield 43 microns long, 47 microns wide, with a pattern of part longitudinal, part network lines; dorsal tubercles 35 microns apart, on rear margin, dorsal setae 42 microns long, projecting caudad. Forelegs 37 microns long, patellar seta 26 microns long; tibia 9 microns long, tarsus 8.75 microns long, claw 7 microns long, featherclaw 6 rayed. Hindlegs 34 microns long, patellar seta 5 microns long, tibia 8 microns long, tarsus 8 microns long, claw 12 microns long. Coxal seta III 31 microns long. Abdomen round, robust; tergites 25-27; sternites 57-60. Lateral seta above genital seta; 31 microns long, on ring 7. First ventral seta 36 microns long, on ring 18; second ventral seta 26 microns long, on ring 30; third ventral seta 18 microns long, on ring 6 from rear; caudal seta about 35 microns long; accessory seta absent (?). Female genitalia 25 microns wide, 12 microns long, coverflap with about 14 ridges, in double row; seta 13 microns long.

Male 110-120 microns long, 40 microns thick. Featherclaw 5 rayed. Male genitalia 20 microns wide, 14 microns long, seta 12 microns long.

Type slide of mites collected from Camphor leaves, *Cinnamomum camphora* Nees & Ebern., Sept. 29, 1938, in Sacramento by H. H. Keifer. Four paratype slides bear this same data. Nearly every camphor leaf has two or more small pockets, opening on the underside, each one situated at the angle between the midrib and a main side vein. On leaves having two of these, they are found at the bases of the first two side veins. In practically every one of these pockets, except on young leaves, a colony of *Gammaphytoptus* is or has been present. I am not informed of any botanical philosophy as to the reason for these pockets, but since they are forming on very young leaves where no mites can be demonstrated, it seems reasonable to consider at present that the mites do not cause them. This mite was collected in Sacramento first on July 8. The species was first called to my attention by Cyril Gammon of this Department, who collected individuals in Pasadena on July 6, 1938. The generic name is in part a transliteration of the original collector's name. No mite has heretofore been described from Camphor.

Part of the individuals from these pockets are very similar to the described and figured species in shape, size, beak, legs, genitalia, etc., but lack the strongly undulate tergites and have a different shield pattern. This mite will be described and discussed in a later installment.

Diptilomiopus prunorum Keifer, new species

Plate XLVII

Female 200-210 microns long, 70 microns thick, robust spindleform, color dull light purplish or grayish purple. Rostrum large, the base horizontal above. Shield 40 microns long, 53 microns wide, declivitous, but little overlying rostrum base, pattern a network; dorsal tubercles 50 microns apart, ahead of rear margin, dorsal setae 6.75 microns long, projecting dorso-anteriorly. Legs with femoral seta missing. Forelegs 49 microns long, patella 6.75 microns long, patellar seta 44 microns long, tibia 15 microns long, tarsus 9 microns long, claw 6.75 microns long, knobbed, featherclaw partly divided, with 5 rays. Hindlegs 45 microns long, patellar seta 16 microns long, tibia 14 microns long, tarsus 12 microns long, claw 7.5 microns long. Sternal ridge prominent; all coxal setae present, coxal setae III 50 microns long. Abdomen with shallow longitudinal subdorsal furrow; tergites 63-66, finely microtuberculate; sternites 88-92, more heavily microtuberculate. Lateral seta ahead of genital seta, 35 microns long, on ring 16. First ventral seta 55 microns long, on ring 36; second ventral seta 55 microns long, on ring 57; third ventral seta 35 microns long, on ring 12 from rear; caudal seta 63 microns long, accessory seta present. Female genitalia 37 microns wide, 20 microns long, coverflap with no ridges, seta 9 microns long.

Male 200 microns long, 65 microns wide. Male genitalia 25 microns wide, 18 microns long, seta 8.5 microns long.

Type slide of mites collected in Sacramento, July 26, 1938, from the under surface of *Prunus triloba* Lindl. leaves, Flowering Almond. Paratype slide with same data except collected July 22. Mites have also been observed on the leaves of Santa Rosa plum, *Prunus* sp., Royal Ann cherry, *Prunus cerasus* L., Ornamental Plum, *Prunus* sp., and peach, *Amygdalus persica* Siel. The species was found to be very numerous on the underside of President Plum leaves, *Prunus* sp., at Auburn, Sept. 20, 1938. Dr. John Lamiman has submitted a slide of this mite from San Jose Prune leaves, *Prunus domestica* L., collected May 21, 1934, by A. M. Foster of the Santa Clara County Agricultural Commissioner's office. The species causes no apparent damage. This mite is of note for the presence of all regular setae except the femoral setae, and also the incompletely divided featherclaws. Compare the figures of this mite with the figure of *Diptilomiopus arctostaphyli* in Eriophyid Studies II. It is of considerable interest to observe the close similarity *prunorum* bears to the Prune infesting *Epitrimerus gigantorhynchus* (Nal.) of Europe as figured in the Denkschriften Akad. Wiss. Wien. Vol. 64 p. 392, Taf. IV, fig. 1 and Taf. V, fig. 7, 1896. Nalepa states this latter species to have two-rayed featherclaws and the figures indicate the femoral setae are present. There is much evidence to consider these two species congeneric. Certainly *gigantorhynchus* is unharmonious in the genus *Epitrimerus*.

Rhyncaphytoptus Keifer, new genus

Rostrum large, more or less horizontal above basally, the rostrum as a whole set at about right angles to the cephalothorax, long, attenuate distally; chelicerae long, projecting ahead basally, and together with the chelicera sheath extending beyond the maxillae proper; the chalicerae then strongly bent down, usually exceeding the maxillae at the end and often slightly recurved, anteriorly. Shield rather short, more or less declivitous toward the front, the dorsal setae set just ahead of rear margin and projecting anteriorly. Legs with usual segments and setae and undivided featherclaw. Abdomen with all regular setae, wormlike to spindleform, the dorsum regularly curved or with shallow subdorsal furrows; sternites more numerous than tergites. Female genital coverflap usually smooth.

Genotype *Rhyncaphytoptus ficifoliae*, new species.

This genus is erected to accommodate Eriophyids with the large *Diptilomiopus*-type of beak that do not have divided featherclaws. The general morphology of these mites seems to indicate that they may mostly run together in one large series with the species having divided

featherclaws at one end, and the undivided featherclaws at the other. *Diptilomiopus prunorum* it will be noted has an incompletely divided featherclaw and is in effect transitional. For that reason the species that was selected as the type of *Rhyncaphytoptus* is one that is sufficiently peculiar to still be separable if and when necessary. The rostrum structure is the principal character defining this group of mites which seem to be separated thereby from the rest of the Phyllocoptinae. This structure is characterized by the sickle-shaped chelicerae, chelicera-sheath extending out ahead of the rostrum base and the long attenuate nearly vertical maxillae. *"Phyllocoptes" megarostris* K. of Installment II belongs here.

Rhyncaphytoptus ficifoliae Keifer, new species

Plate XLVIII

Female 180-190 microns long, 45 microns wide, 55 microns thick, narrow, elongate spindleform, or wormlike, amber in color. Rostrum 53 microns long. Shield 44 microns long, 42 microns wide, nearly smooth, the disc flanked by a curved line, anteriorly extending over rostrum base; dorsal tubercles 33 microns apart, slightly ahead of rear margin, dorsal setae 18 microns long. Forelegs 38 microns long, patellar seta 23 microns long, tibia 9 microns long, tarsus 9 microns long, claw 8.75 microns long, featherclaw 6 rayed. Hindlegs 34 microns long, patellar seta 4.5 microns long, tibia 7 microns long, tarsus 8.5 microns long, claw 8.5 microns long. Coxal setae III 41 microns long. Abdomen with broad, somewhat scale-like tergites which have spine-like microtubercles along rear edge, no subdorsal furrows; sternites as usual, the rear few distinct from the anterior part; tergites 19-20, sternites 75. Lateral seta ahead of genital seta, 13 microns long, on ring 12; first ventral seta 40 microns long, on ring 33; second ventral seta 16 microns long, on ring 46; third ventral seta 27 microns long, on ring 5 from rear; caudal seta 67 microns long; accessory seta present. Female genitalia 27 microns wide, 14 microns long, coverflap smooth, seta 14 microns long.

Male not seen.

Type slides of mites taken from the undersides of Fig leaves, *Ficus* sp., near Sacramento, Sept. 7, 1938, by the writer. Three paratype slides bear this data. The mite is a vagrant and all infested trees so far examined are black figs. Specimens are also on hand from Fairfield Fig, Aug. 26, collected by the writer. No damage was noted. The immature stages of *ficifoliae* are more or less covered with white flocculent wax as in other species of this immediate type.

Other mites which may belong in this *Rhyncaphytoptus* series (as well as *Epitrimerus gigantorhynchus* Nal.) are: *Epitrimerus massalongianus* Nal., *Phyllocoptes gracilipes* Nal., and *Phyllocoptes longirostrus* Nal. The rostrum description of *Phyllocoptyches* reads as though it may be associated with this group, but no specimens of that genus have been available for study.

Epitrimerus myersi Keifer, new species

Plate XLIX

Female 110-120 microns long, 31 microns wide, 26 microns thick; very light yellow to light amber, elongate spindleform, with a high central abdominal ridge. Rostrum rather large, projecting down. Shield 31 microns long, 28 microns wide, subtriangular, a small lobe overlying rostrum base, the design of lines of dots centrally and a band of microtubercles laterally, dorsal tubercles 14 microns apart, situated on rear margin, dorsal setae 25 microns long, projecting caudad. Forelegs 24 microns long, patellar seta 20 microns long; tibia 6 microns long, tarsus 6 microns long, claw 6 microns long, knobbed. Featherclaw 5 rayed. Hindlegs 22.5 microns long, patellar seta 7 microns long, tibia 5.5 microns long, tarsus 5.5 microns long, claw 6 microns long. Sternal line forked; coxal setae III 26 microns long. Abdomen with a prominent central ridge, the furrows lacking microtubercles; tergites about 55; sternites about 62. Lateral seta above genital seta, 14 microns long, on ring 6. First ventral seta 33 microns long, on ring 17; second ventral seta 22 microns long, on ring 34; third vetral seta 13 microns long, on ring 7 from

rear; caudal seta 37 microns long, accessory seta present. Female genitalia 18 microns wide, 11.5 microns long, coverflap with 12-14 ridges, seta 12 microns long.

Male usually smaller, but often as large as the female; 90-120 microns long; male genitalia 13 microns wide, 8.5 microns long, seta 12 microns long.

Type slide, so designated, of mites collected on the Rowland Estate, Puente, Cal., from Avocado (*Persea americana* Mill.) fruits, Oct. 17, 1938, by L. Emery Myers of the Los Angeles Agricultural Commissioner's office. Five paratype slides also bear this data. The mite is found under the fruit buttons where it causes some blackening of the epidermis. It also occurs in the buds where it slightly discolors the inner bud-scale surface. The species is named for Myers who discovered it. Recognition characters are the high "keeled" abdomen, the design of the shield, position of shield setae, and microtuberculation of the abdomen. Additional localities represented are Fullerton and Irvine, Orange County, R. J. Bumgardner, collector.

Calepitrimerus nolinae Keifer, new species

Plate L

Female 170-190 microns long, 60-65 microns wide, 40-45 microns thick, flattened spindleform, light yellow, pink or amber with rows of white, waxy filiaments dorsally—one down the mid ridge, and one on each side. Rostrum rather large, projecting down. Shield 60 microns long, 62 microns wide, the front lobe broad and blunt, the sides sinuate in dorsal view; design a loose network; dorsal tubercles 24 microns apart, ahead of rear margin; dorsal setae 13 microns long, projecting anterocentrad. Legs with femoral seta absent. Forelegs 45 microns long, patellar seta 31 microns long; tibia 12 microns long, tarsus 10 microns long, claw 9 microns long, tapering, featherclaw 5 rayed. Hindlegs 37 microns long, patellar seta 14 microns long, tibia 8.75 microns long, tarsus 8.5 microns long, claw 8.75 microns long. Coxae with setae I well ahead of coxal junction; coxal setae III 42 microns long. Abdomen with a central longitudinal ridge ending on about tergite 31 or 32, slightly recurrent on some of the last tergites, dorsum generally flat, slightly concave toward rear; microtubercles principally on sternites; tergites 50-53; sternites 55-60. Lateral seta a little ahead of genital seta, 33 microns long, on ring 7. First ventral seta absent, second ventral seta absent, third ventral seta 26 microns long, on ring 7 from rear; caudal seta 60 microns long, accessory seta absent. Female genitalia 27 mircons wide, 15 microns long, coverflap with about 14 ridges in two ranks, seta 24 microns long.

Male 160-175 microns long, 60 microns wide, 40 microns thick. Male genitalia 23 microns wide, 15 microns long, seta 14 microns long.

Type slide so designated, with mites collected from *Nolina parryi* Wats. on the mountains west of Indio, Cal., at about 3500 feet, Oct. 10, 1938, by the writer. Seven paratype slides bear this data. The plant is a Yucca type. The mites are found down among the younger leaves and are vagrants, principally on the inner concave surfaces. No damage was noted. While the species is placed in *Calepitrimerus* it actually brings that genus very close to the typical *Epitrimerus* species. The breaking of the median longitudinal ridge toward the rear in a concavity is the character relied on to place the species generically. The waxy filaments which occur on the mite in life are formed along the mid-ridge, and the sides. The skin structure producing these is difficult to discern but seems to be a thickening of that part of the tergites.

Sierraphytoptus Keifer, new genus

Rostrum moderate in size, projecting down. Legs with usual number of setae, the patellar seta of the hind legs lateral. Shield with usual dorsal setae and a pair of frontolateral setae, also a small spine under frontal lobe. Abdomen with tergites broad and flattened, projecting a little laterally; sternites much more numerous than tergites, microtuberculate. Usual setae present and a pair of subdorsal setae toward anterior part of abdomen. Female genital coverflap smooth.

Genotype as follows:

Sierraphytoptus alnivagrans Keifer, new species

Plate LI

Female 160-170 microns long, 70 microns wide, 40-50 microns thick, flat spindle-form, yellow to amber in color. Rostrum projecting down. Shield 51 microns long, 77 microns wide, design an obscure network; a short spine underneath frontal lobe; frontolateral setae 48 microns apart, 15 microns long; dorsal tubercles 28 microns apart, ahead of rear margin, dorsal setae 15 microns long, directed dorsocentrad. Forelegs 43 microns long, patella 6.75 microns long, patellar seta 28 microns long, tibia 11 microns, tarsus 10 microns long, claw 5 microns long, knobbed, featherclaw 2 rayed. Hindlegs 37 microns long, patella 6.5 microns long, patellar seta 23 microns long, laterally placed, tibia 10 microns long, tarsus 10 microns long, claw 5.5 microns long. Sternal line more or less clearly forked; coxal setae III 35 microns long. Abdomen flattened, the tergites projecting a little at the sides, the sternites entirely or centrally microtuberculate; tergites 16-17, sternites 55-58. Subdorsal seta on third tergite 22 microns long; lateral seta ahead of genital seta, 14 microns long, on ring 6; first ventral seta 17 microns long, on ring 22; second ventral seta 17 microns long, on ring 36; third ventral seta 25 microns long, on ring 5 from rear, caudal seta 70 microns long; accessory seta present. Female genitalia 33 microns wide, 20 microns long, coverflap smooth, ridges at base, seta 17 microns long.

Male 150-160 microns long, 60 microns wide, 36-45 microns thick. Male genitalia 18 microns wide, 14 microns long, seta 12 microns long.

Type slide of mites collected on the underside of *Alnus tenuifolia* Nutt. leaves in the Cisco district, Placer County, Sept. 13, 1938. Three paratype slides bear this same data. The mites are most frequently found along the veins and on the midrib. This species is placed in a new genus principally because of the frontolateral and subdorsal setae as in *Phytoptus*. It is of interest to note that the female genitalia of this Phyllocoptine mite resembles that of *Phytoptus corniseminis* new species.

Oxypleurites neocarinatus Keifer, new species

O. carinatus Keifer (not Nalepa), Bul. Cal. Dept. Agr. Vol. 27, p. 312 Plate XXXVII, p. 323, Sept. 7, 1938

Type slide, so designated of mites collected near Novato, Marin County, June 25, 1938, as vagrants on the leaves of *Aesculus californicus* (Spach.) Nutt. by the writer. Four paratype slides also bear this data. The mite, in company with *Phyllocoptes aesculifoliae* Keifer, causes silvering of both leaf surfaces. The above reference was published before the original description was seen and it was originally thought that this mite was *carinatus* Nalepa. Nalepa's figure, however, indicates a sharp ridge on the shield of *carinatus* not possessed by *neocarinatus*. For the description of *neocarinatus* see the above reference.

Oxypleurites maxwelli Keifer, new species

Plate LII

Female 140-160 microns long, 60 microns wide, 40 microns thick, flattened, wedge-shaped, yellow to amber color. Rostrum projecting down. Shield 45 microns long, 60 microns wide, acuminate over rostrum, design an open network; dorsal tubercles on rear margin; dorsal setae 11 microns long, projecting to the rear. Forelegs 35 microns long, patellar seta 28 microns long; tibia 8.75 microns long, tarsus 7.5 microns long, claw 6 microns long, knobbed, featherclaw 4 rayed. Hindlegs 32 microns long, patellar seta 5.5 microns long, tibia 6.75 microns long, tarsus 6.75 microns long, claw 6 microns long; coxal setae III 34 microns long. Abdomen roof-like, the dorsal ridge serrate in side view, part of the tergites prominently lobed laterally, a posterior notch at the end of the dorsal ridge; tergites 19-21, sternite about 55. Lateral seta ahead of genital seta, 15 microns long, on ring 7; first ventral seta 36 microns long, on ring-18-19; second ventral seta 15 microns long,

on ring 33-35; third ventral seta 25 microns long, on ring 4-5 from rear; caudal seta 53 microns long, accessory seta absent. Female genitalia 26 microns wide, 16 microns long, coverflap with 18 to 20 ridges, seta 13 microns long.

Male 125-145 microns long, 50 microns wide, 30 microns thick. Male genitalia 18 microns wide, 13 microns long, seta 12 microns long.

Type slide of mites taken from leaves of Olive, *Olea europa* L., by the writer in Sacramento, Sept. 21, 1938. Four paratype slides bear this data. The mite is principally an upper surface feeder but on occasion numerous mites may be found on the under surface. The species is named for its discoverer, Dr. K. E. Maxwell of the Riverside Experiment Station, who sent me specimens from Santa Paula, and to whom I am indebted for other species of Eriophyids. The serrate roof-like back, the posterior notch and the unevenly projecting tergites, are the chief distinguishing characters of the species.

In the following key the genera in bold-faced type are those with representatives in California. *Callyntrotus schlectendali* Nal. has been found in California and will be figured in the next installment. The genus *Tegonotus* is represented in this country by at least one species which will be described at a later date. The genus *Caliphytoptus* is close to *Tegonotus* but the flattened dorsum and large posterior notch are ample separation characters. The genotype of *Tegonotus* can be considered as *fastigatus* Nal. (Anzeiger Akad. Wiss. Wien. Vol. 27, p. 213, 1890). The key is for the purpose of incorporating the generic changes proposed in this paper.

1. Abdominal rings subequal dorsally and ventrally, at least on the anterior quarter of the abdomen; body usually wormlike, less often spindleform; shield not overlying rostrum base to any extent 2
1. Abdominal rings sharply divided into tergites (dorsal half rings) and sternites (ventral half rings) by their different structure and number; body usually spindleform or wedge-shaped, less often wormlike; shield usually overlying rostrum base 8

ERIOPHYINAE

2. Abdominal rings subequal throughout 3
2. Abdominal rings with sternites more numerous than tergites posteriorly 7
3. Frontal or frontolateral setae on shield, subdorsal setae on abdomen, microtubercles rounded ..... **Phytoptus** Du J
3. No frontal or subdorsal setae 4
4. Abdomen lacking furrows 5
4. Abdomen with one or more dorsal furrows 6
5. Abdomen with narrow rings; microtuberculate or smooth; three pairs of ventral bristles ..... **Eriophyes** V. Sieb.
5. Abdomen with broad rings, smooth; first and second pairs of ventral setae missing ..... Cecidodectes Nal.
5. Abdomen microtuberculate, the microtubercles each bearing 1 or 2 erect or recumbent little hairs ..... Trichostigma Gerber
6. Abdomen with a median dorsal longitudinal furrow ..... Monochetus Nal.
6. Abdomen with several dorsal longitudinal furrows ..... Phytoptochetus Nal.

PHYLLOCOPTINAE

7. ..... **Paraphytoptus** Nal.
8. Number of tergites greater than the number of sternites, the sternites broad, overlapping; rostrum large ..... Phyllocoptyches Nal.
8. Number of tergites less than the number of sternites 9
9. Rostrum large, tapering, at right angles to body, chelicera-sheath projecting ahead of maxillae at base and also ahead of shield, chelicerae long, sickle-shaped; shield often shortened and declivitous; dorsal setae absent or projecting anteriorly 10
9. Rostrum curved down or projecting down, usually small, the chelicera sheath never separated from the maxillae, the whole rostrum base often covered by the shield; dorsal setae various 11
10. Featherclaw bifurcate; strong sternal ridge ..... **Diptilomiopus** Nal.
10. Featherclaw undivided; no sternal ridge ..... **Rhyncaphytopus** n. g.
11. Dorsum with longitudinal rows of wax-generating spines or chitinous pegs ..... **Callyntrotus** Nal.
11. Dorsum without these rows of spines though at times with wax-generating bands 12
12. Abdomen flattened, with a sublateral longitudinal furrow on each side of the narrowed sternal area; frontal seta present or absent ..... **Platyphytoptus** Keifer
12. Abdomen without sublateral furrows, though tergites at times overhanging the sternites, sternal area not narrowed 13

13. Shield with frontolateral setae; abdomen with or without subdorsal setae--- 14
13. No frontolateral or subdorsal setae present---------- 15
14. Both frontolateral and subdorsal setae present, the tergites smooth and body sides somewhat serrate laterally in dorsal view----------**Sierraphytoptus** n. g
14. Subdorsal abdominal setae absent; sternites rising high on the sides, the tergites rather flattened and each with a pattern of small longitudinal ridges ----------**Mackiella** n. g.
15. Tergites projecting toothlike laterally on part or all of the anterior abdominal 4/5; body flattened, with or without a central abdominal ridge--**Oxypleurites** Nal.
15. Tergites without prominent lateral projections---------- 16
16. Abdominal dorsum flat or concave, flanked laterally on each side by a longitudinal ridge ----------**Phyllocoptruta** Keifer
16. Abdomen with a central, usually rather acute dorsal longitudinal ridge and often a subdorsal longitudinal furrow, or the dorsum concave---------- 17
16. Abdomen evenly curved or with but a slight subdorsal furrow, without a sharp central longitudinal ridge---------- 19
17. Tergites narrower, partly or entirely microtuberculate, the ridge entire, a subdorsal furrow on each side----------**Epitrimerus** Nal.
17. Tergites narrower, partly microtuberculate, the ridge ending or discontinuous posteriorly with the subdorsal furrows confluent to the rear; abdominal dorsum flat or concave----------**Calepitrimerus** Keifer
17. Tergites broader, non-microtuberculate, slight or no subdorsal furrow------ 18
18. Dorsum flattened, with a large posterior transverse notch--**Caliphytoptus** Keifer
18. Dorsum roof-like, the tergites sometimes projecting tooth-like mid-dorsally, no notch ----------**Tegonotus** Nalepa
19. Abdominal dorsum rounded, with each tergite strongly lobed, entirely microtuberculate ----------**Gammaphytoptus** n. g.
19. Abdominal dorsum rounded, often with slight sublateral furrows, the tergites smooth or microtuberculate ---------- 20
20. Posterior part of the abdomen not distinct from anterior part--**Phyllocoptes** Nal.
20. Posterior part of abdomen so ringed as to be distinct from anterior part--- ----------**Anthocoptes** Nal.

HOST LIST

Pinaceae

Pinus murrayana Balf.
Platyphytoptus *multisternatus* n. sp., in needle sheaths.
Pinus tuberculata Gord.
Platyphytoptus *sabinianae* K.
Pinus ponderosa Dougl.
Platyphytoptus *sabinianae* K.

Liliaceae

Nolina parryi Wats.
Calepitrimerus nolinae n. sp., vagrant on inner leaves.

Palmaceae

Phoenix dactylifera L.
Mackiella phoenicis n. sp., in folded leaves.

Betulaceae

Alnus tenuifolia Nutt.
Sierraphytoptus alnivagrans n. sp., vagrant on leaf undersurface.

Cornaceae

Cornus nuttalli Aud.
Phytoptus corniseminis, n. sp., in buds and seeds.

Lauraceae

Cinnamomum camphora H & E.
Gammaphytoptus camphorae n. sp., in leaf pockets.
Persea americana Mill.
Epitrimerus myersi n. sp., in fruit buttons and buds.

Oleaceae

Olea europa L.
Oxypleurites maxwelli n. sp., vagrant on leaves.

Rosaceae

Prunus emarginata (Dougl.)
Eriophyes emarginatae n. sp., in finger-like upper surface leaf galls.
Eriophyes sevagei n. sp., inquiline with E. *emarginatae.*
Rubus parviflorus Nutt.
Phyllocoptes *parviflori,* n. sp., vagrant on leaf undersurface.
Prunus triloba Lindl.
Diptilomiopus *prunorum* n. sp., vagrant on leaf undersurface.
Prunus cerasus L.
Diptilomiopus *prunorum* n. sp.
Prunus domestica L.
Diptilomiopus *prunorum* n. sp.
Amygdalus persica Siel.
Diptilomiopus *prunorum* n. sp.

Moraceae
Ficus sp.
Ryncaphytoptus ficifoliae n. sp., vagrant on leaf undersurface.
Sapindaceae
Aesculus californicus Spach.
Oxypleurites neocarinatus n. sp., vagrant on leaves.
Labiatae
Salvia apiana Jeps.
Paraphytoptus salviacrinis n. sp., vagrant on leaves and stems.

DESIGNATIONS ON PLATES

AP—Anterior apodeme of the female genitalia.
AP1—Anterior apodeme and associated internal genital structures.
D—Dorsal view of mite.
DA—Dorsal view of anterior section of mite.
DS—Dorsal view of shield and adjacent tergites.
ES—Detail of side skin.
F—Featherclaw.
GF—Female genitalia.
GF1—Female genitalia and coxae.
GM—Male genitalia.
GM1—Male genitalia and coxae.
L—Left legs.
LT—Tarsus or tarsi and adjacent joints.
S—Side view of mite.
SA—Side view of anterior part.
V—Ventral view of mite.

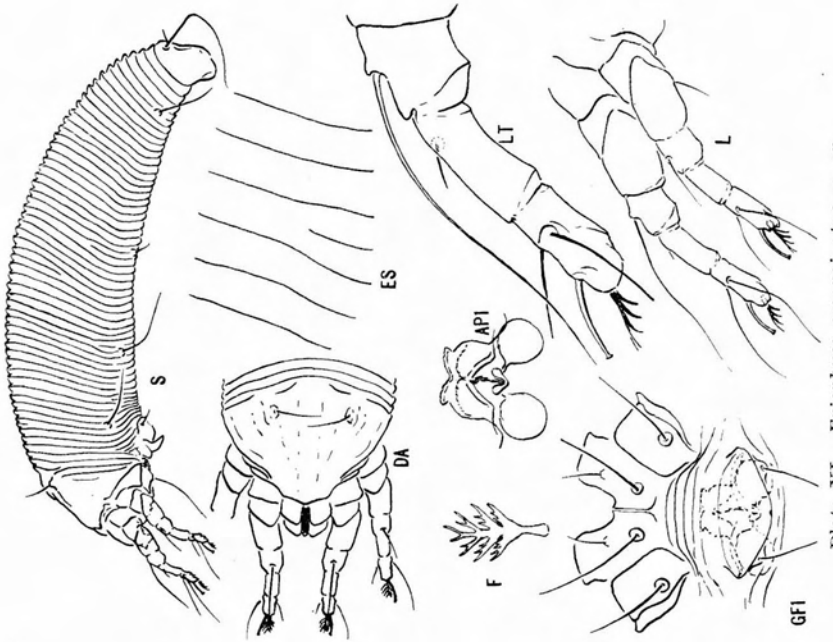

Plate XL.—*Eriophyes emarginatae*, n. sp.

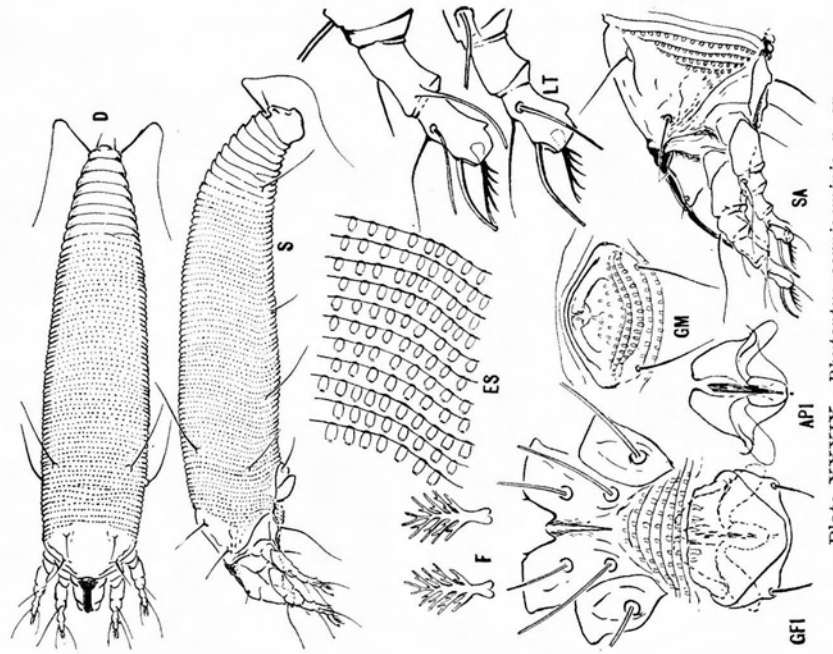

Plate XXXIX.—*Phytoptus coruiscminis*, n. sp.

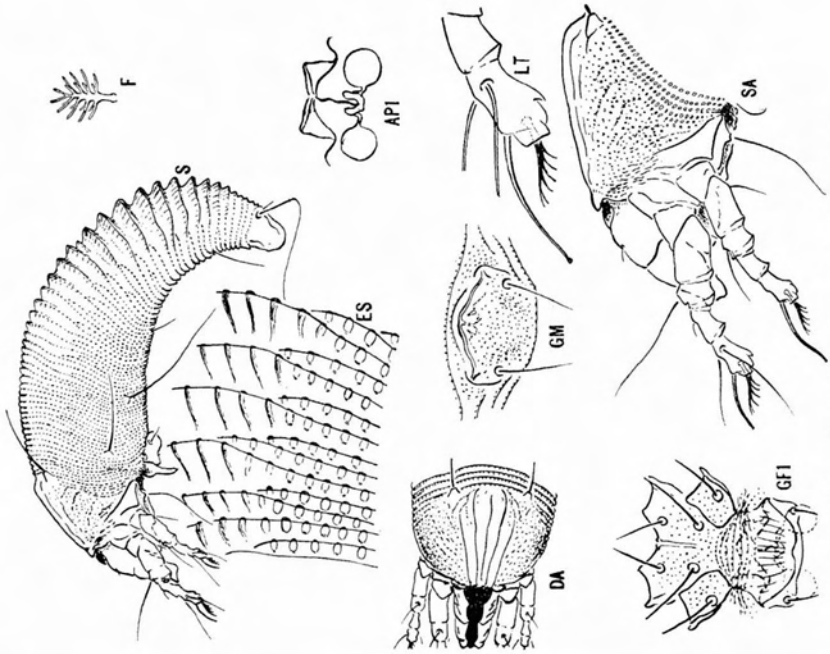

Plate XLII—*Pavaphytoptus salviacrinis*, n. sp.

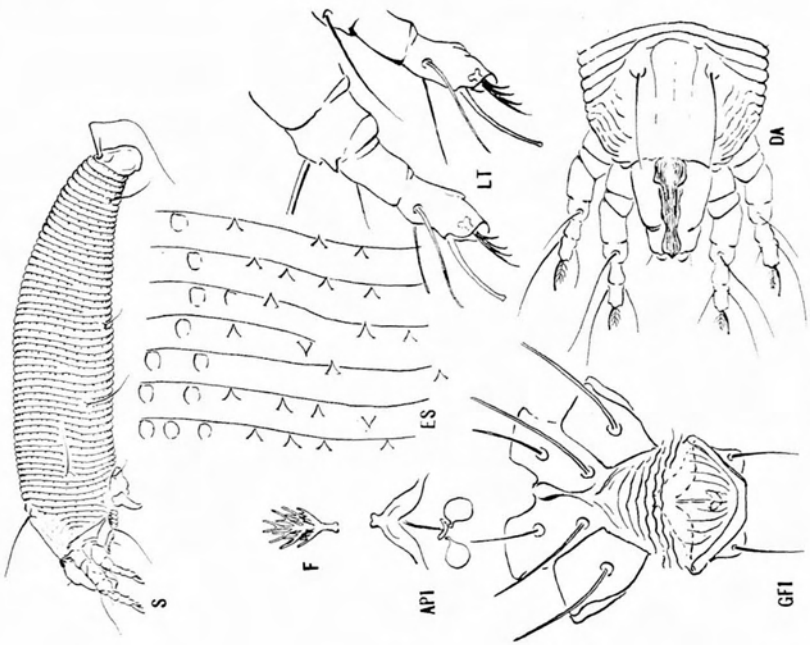

Plate XLI—*Eriophyes savagei*, n. sp.

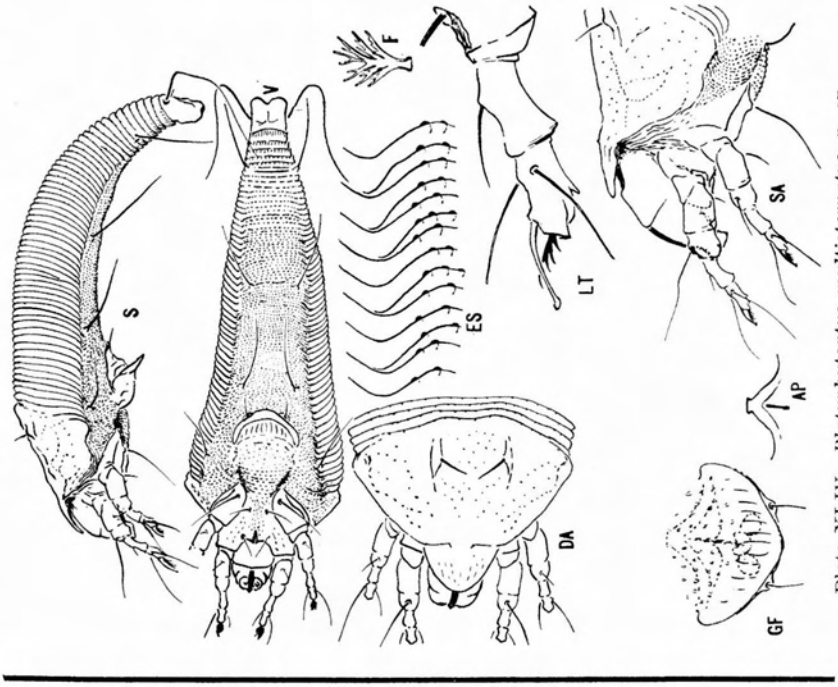

Plate XLIV—*Platyphytoptus multisternatus*, n. sp.

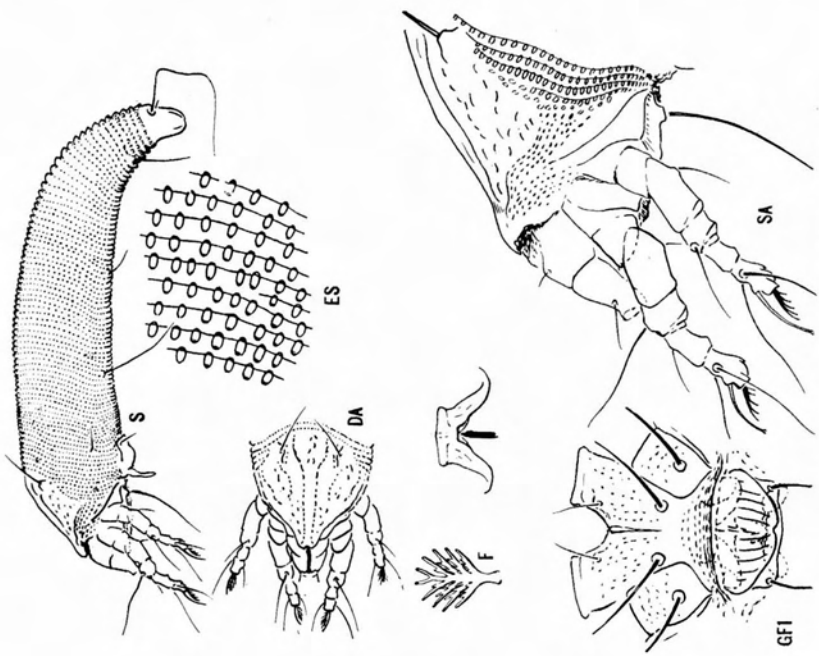

Plate XLIII—*Phyllocoptes parviflori*, n. sp.

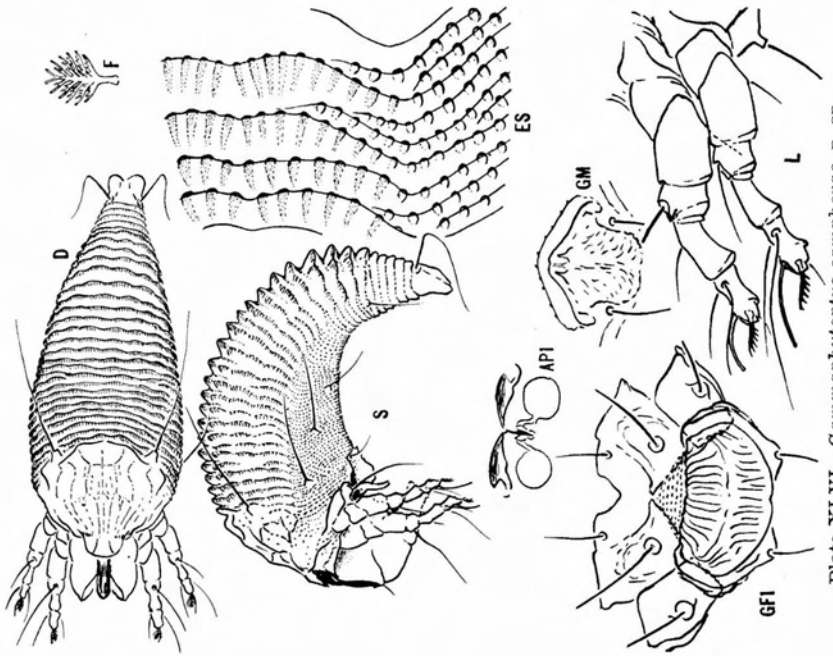

Plate XLVI—*Gammaphytoptus camphorae*, n. sp.

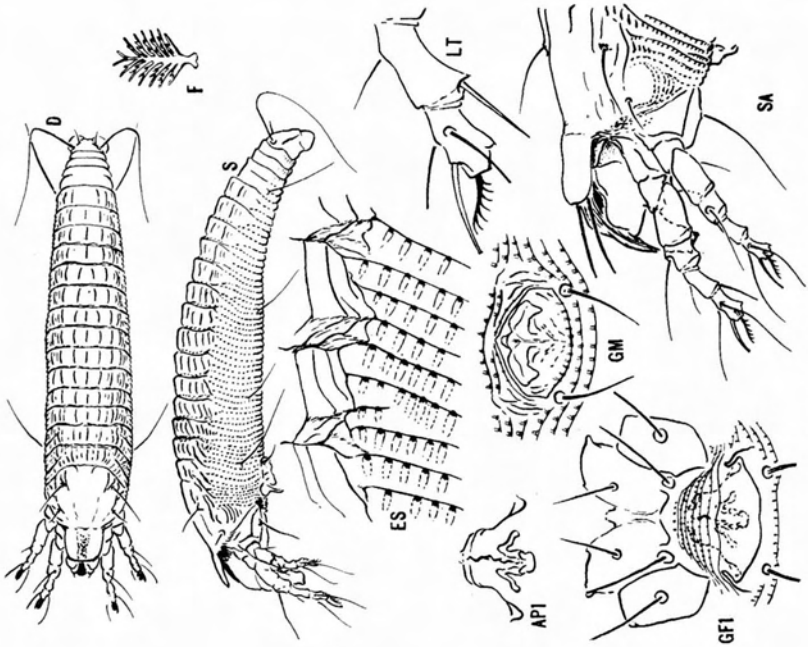

Plate XLV—*Mackiella phoenicis*, n. sp.

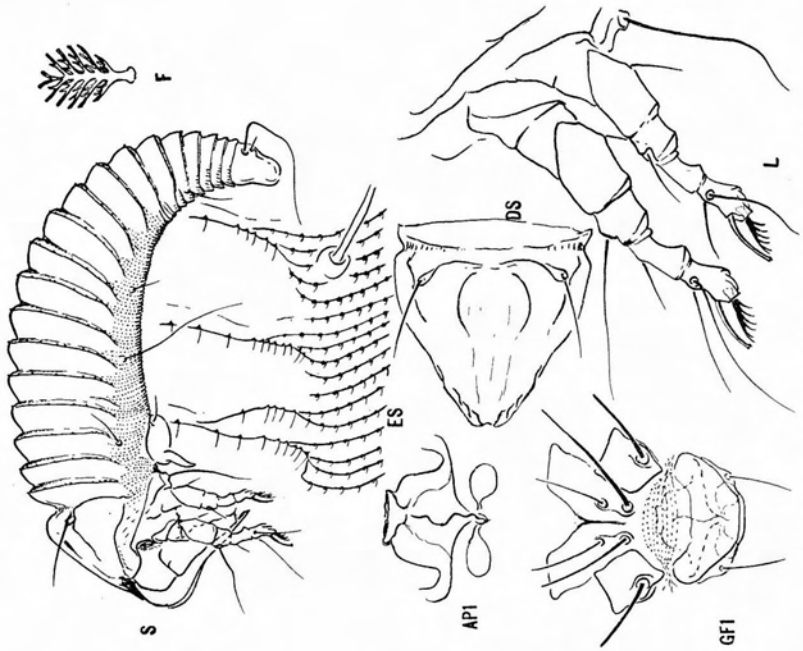

Plate XLVIII—*Rhyncaphytoptus ficifoliae*, n. sp.

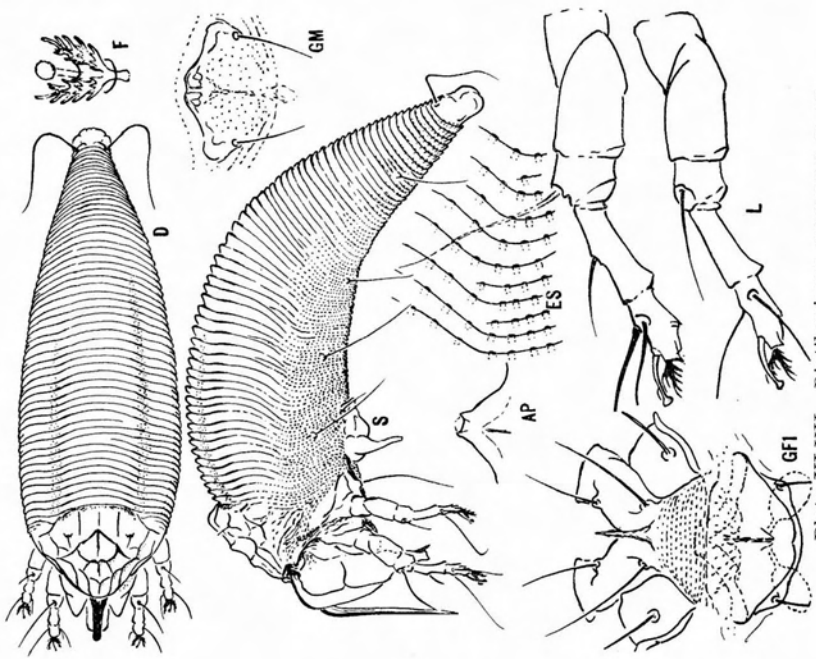

Plate XLVII—*Diptilomiopus pruniorum*, n. sp.

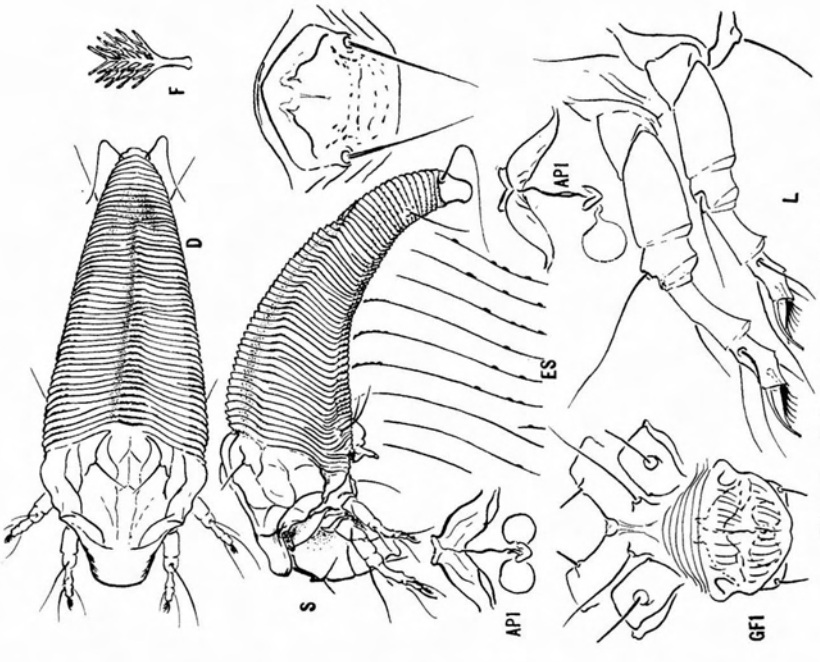

Plate L.—*Calepitrimerus nolinae*, n. sp.

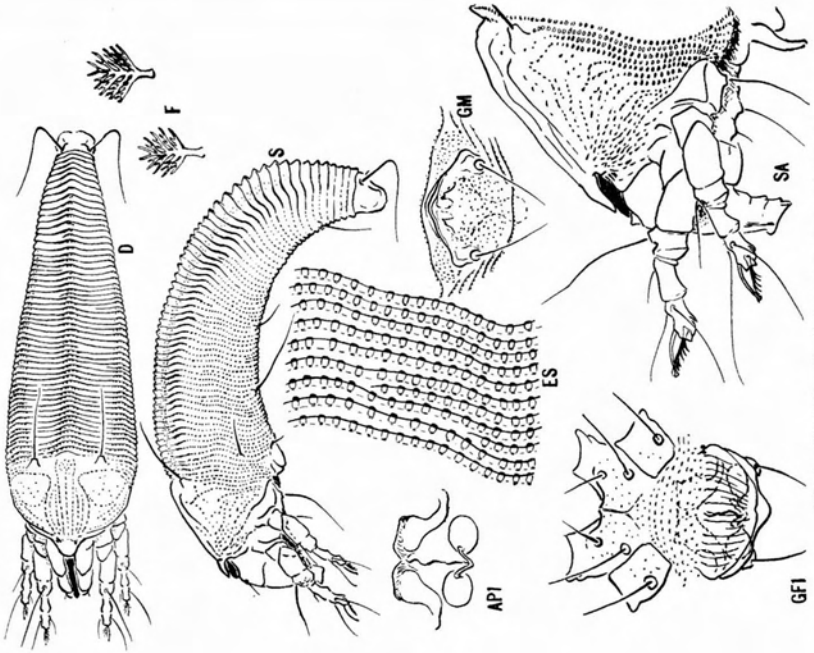

Plate XLIX—*Epitrimerus myersi*, n. sp.

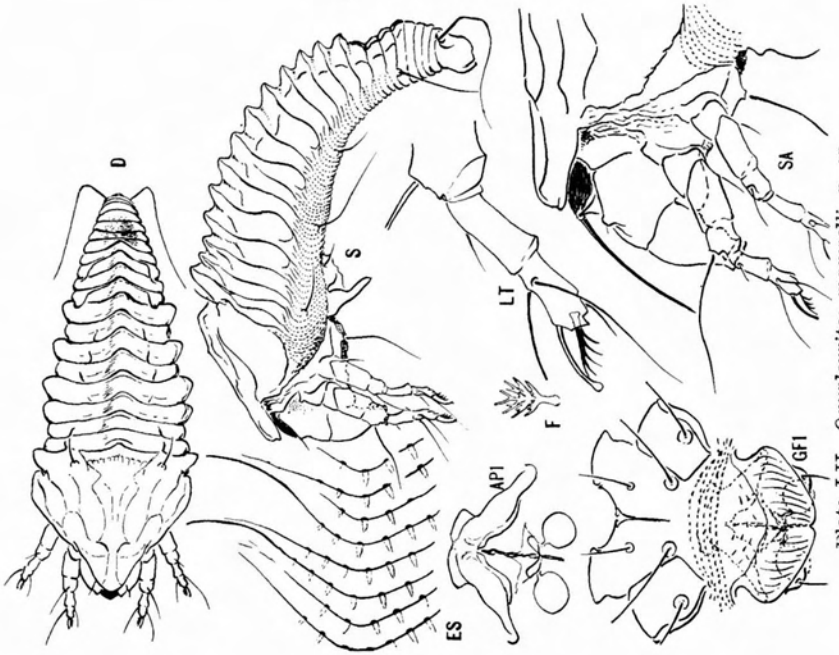

Plate LII—*Oxypleurites maxwelli*, n. sp.

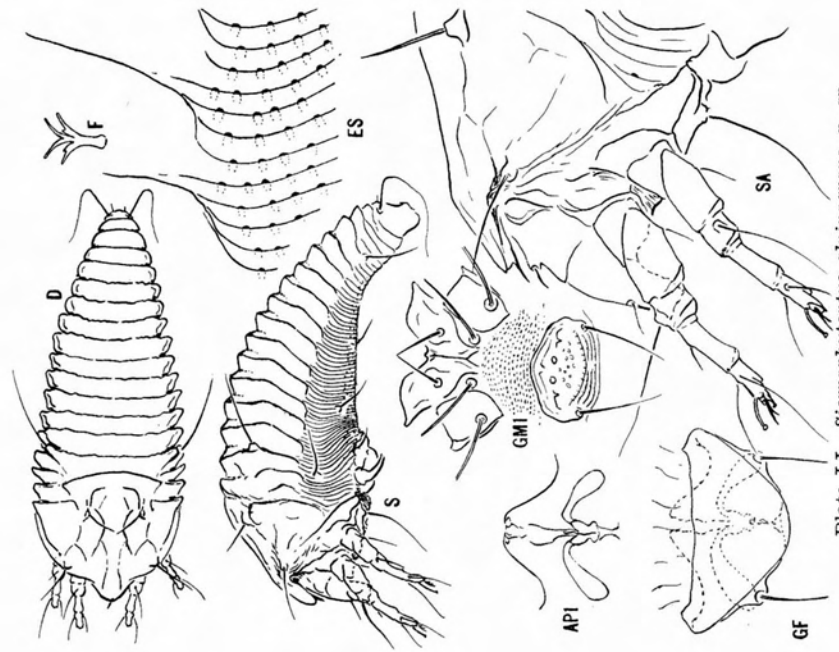

Plate LI—*Sierraphytoptus alvivagrans*, n. sp.