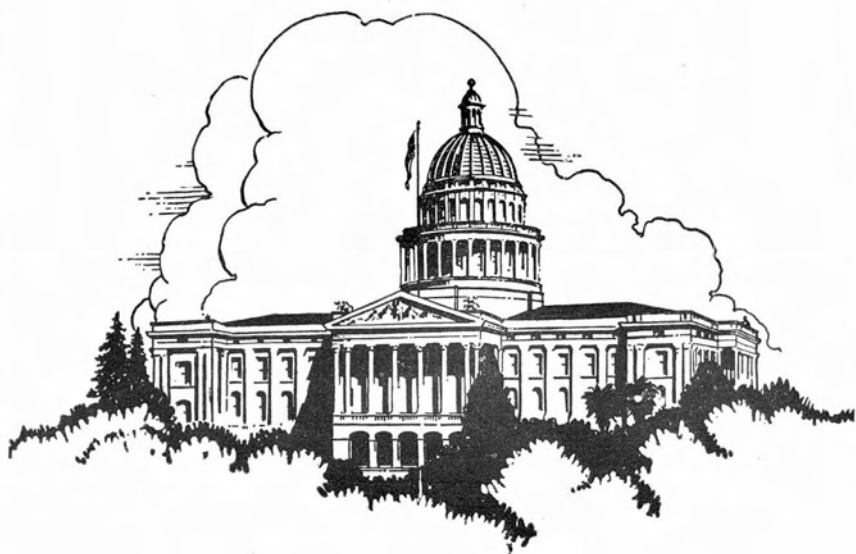


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## ERIOPHYID STUDIES V

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Eriophyid Studies IV was issued in the Bul. Cal. Dept. Agr., Vol. 28, p. 223, Apr. 21, 1939. The present installment brings up to 78 the number of species figured in this series.

Since a number of mites have been received for determination, it becomes necessary to discuss methods of satisfactorily shipping Eriophyids for identification purposes. As the mites are prepared for microscopical examination in Berlese fluid, the object is to convey them in such a manner that they will prepare properly in this fluid. It has not been possible as yet to reclaim Eriophyid mites from alcohol. Therefore, *do not use alcohol*. Those collecting mites who are near enough to Sacramento to permit mail reaching here within 48 to 60 hours can send portions of the infested plant in a fresh condition. *Do not wrap in wet paper*, as excess moisture causes the mites to bog down and become hard to find and handle.

Under some conditions, especially in well populated leaf or stem galls, numerous individuals will mummify without crawling away. These make excellent mounts.

For general use the best preserving fluid is about 5% Chloral Hydrate in water. Mites will usually remain in a reclaimable condition in this solution indefinitely.

### **Eriophyes brevitarsus** Fockeu, 1890

Fockeu; Rev. Biol. Nord. France, Vol. 3, p. 3, 1890.

Hodgkiss; Ins. of N. Y., Cornell Agr. Exp. Sta., Mem. 101, p. 1077, Jan. 1928.

Nalepa, Marcellia, Vol. 25, p. 84, 1929.

This mite is mentioned to show the use of *brevitarsus* beginning 1890. The typical form of the species is found on *Alnus glutinosa* Gart., where it forms an Erineum.

### **Eriophyes brachytarsus** Keifer, new name

*Eriophyes brevitarsus* Keifer, Bul. Cal. Dept. Agr., Vol. 28, No. 3, p. 224, April 21, 1939.

This new name is here given to the leaf purse-gall mite of California black walnut, since the first name given to the species proves to be a homonym as shown above.

**Eriophyes wisteriae** Keifer, new species

## Plate LXVIII

Female 165-180 microns long, 40 microns thick, wormlike, light yellowish-white. Rostrum 33 microns long, bent down. Shield 27 microns long, 24 microns wide, the disc indistinctly flattened and oval, sides with a band of fine granulations; dorsal tubercles 13.5 microns apart, slightly ahead of rear margin, dorsal setae 12 microns long, projecting cephalad. Forelegs 26 microns long, patellar seta 18 microns long, tibia 5.5 microns long, tarsus 5.5 microns long, claw 6.5 microns long, knobbed, featherclaw 5 rayed. Hindlegs 23.5 microns long, patellar seta 6 microns long, tibia 4 microns long, tarsus 5 microns long, claw 8.5 microns long. Anterior coxae indistinctly separated; coxal seta III 28 microns long. Abdomen with 64-67 rings; some ventrad reduction in ring number. Lateral seta above genital seta, 9 microns long, on about ring 6; first ventral seta 29 microns long, on about ring 19; second ventral 3 microns long, on about ring 34; third ventral 16 microns long, 5 rings from rear; caudal seta about 45 microns long; accessory seta absent. Female genitalia 19 microns wide, 12 microns long, coverflap with 10-12 ridges, seta 3 microns long.

Male not seen.

**Type locality:** Balboa, California. **Collected:** Mar. 28, 1939. The mites were found in material sent in by Earl Gammon. **Host:** *Wisteria* sp. **Relation to host:** The mites were taken from the buds. **Type slide:** So designated, bearing the above data. **Paratype slides:** Three in number, bearing the above data.

This mite is characterized by the forward directed shield setae, the shield pattern, the minute second ventral seta, and the lack of an accessory seta. It is similar to the boxwood mite, *Eriophyes canestrini* Nal.

**Eriophyes vaccinii** Keifer, new species

## Plate LXIX

Female 185-210 microns long, 57 microns thick, wormlike, whitish. Rostrum 22 microns long, bent down. Shield 25 microns long, 45 microns wide, pattern indistinct, the submedian lines indicated to rear; side with a band of tubercles; dorsal tubercles 20 microns apart, on rear margin; dorsal setae 25 microns long, projecting caudad. Legs short and chunky. Forelegs 23 microns long, patellar seta 20 microns long, tibia 4.5 microns long, seta missing, tarsus 5.5 microns long, claw 5.75 microns long, slightly knobbed, featherclaw 6 rayed. Hindlegs 20 microns long, patellar seta 8 microns long, tibia 4 microns long, tarsus 4.5 microns long, claw 9 microns long. Coxae contiguous, setae I near apex of fore coxae; coxal seta III 30 microns long. Abdomen with about 65 rings. There is considerable ventrad ring reduction. Lateral seta above genital seta, 19 microns long, on about ring 7; first ventral seta 33 microns long, on about ring 20; second ventral 35 microns long, on about ring 35; third ventral 13 microns long, rather stout, 6 rings from rear; caudal seta about 40 microns long; accessory seta absent. Female genitalia 18 microns wide, 11 microns long, coverflap with about 10 ridges, seta 13 microns long.

Male 150-170 microns long, 40 microns thick. Male genitalia 17 microns wide, 11 microns long, seta 7 microns long.

**Type locality:** Atkinson, N. C. **Collected:** Mar. 15, and Apr. (15?), 1939, by W. H. Moon for H. G. Huntington. **Host:** *Vaccinium* hybrid variety Rancoacas. **Relation to host:** the mites were collected in the flower buds where they cause a "red blistered unnatural appearance." **Type slide:** Of mites taken during April and the property of the U. S. Bureau of Entomology. **Paratype slides:** Six in number, with either of the above dates, and half returned to the Bureau. This mite has been studied through the kindness of Dr. C. F. W. Muesebeck, and the mites bear U. S. Bur. Ent. lot No. 39-3366. The species seems to have a facies all its own and is somewhat suggestive of the pine mite, *Phytoptus pini* Nal. The short chunky legs with the foretibial seta missing are perhaps the most characteristic features of the species.

**Eriophyes ceanothi** Keifer, new species

## Plate LXX

Female 120-145 microns long, 38 microns thick, body wormlike, yellow to orange. Rostrum 28 microns long, bent down. Shield 26 microns long, 28 microns wide, with broken lines in disc and sides covered with microtubercles; dorsal tubercles 20 microns apart, on rear margin, dorsal setae 20 microns long, projecting caudad. Forelegs 29 microns long, patellar seta 24 microns long, tibia 6.75 microns long, tarsi 6.5 microns long, claw 7.5 microns long, knobbed, feather-claw 5 rayed. Hindlegs 25 microns long, patellar seta 8.5 microns long, tibia 5.5 microns long, tarsus 6 microns long, claw 7.5 microns long. Anterior coxae contiguous. Coxal seta III 31 microns long. Abdomen with 63-67 rings, some ventrad reduction in ring number. Lateral seta above genital seta 20 microns long, on about ring 8; first ventral seta 35 microns long, on about ring 22; second ventral 13 microns long, on about ring 40; third ventral 22 microns long, 5 rings from rear; caudal seta 50 microns long, accessory seta present. Female genitalia 17.5 microns wide, 11 microns long, coverflap with 10-12 ridges, seta 13 microns long.

Male not seen.

**Type locality:** Crater Lake, Oregon. **Collected:** October 13, 1938, by M. L. Jones of this Department. **Host:** *Ceanothus valutinus* Dougl. Tobacco Bush. **Relation to host:** These mites form small lower surface bead galls on the leaves. These small galls are not embedded in the leaf tissue but project below. They are most often found in colonies and are numerous where found. However, most of the galls contain no mites. **Type slide:** So designated, of mites with the above data. **Paratype slides:** Five slides so designated with above data. These galls were observed as numerous on this host at Fallen Leaf Lake, El Dorado County, July 28, 1938. Mrs. Iris Savage also found numerous galls on this plant at Donner Lake. This is the first mite described from *Ceanothus*. The species is allied to *Eriophyes ficus* Cotte, *E. essigi* Hassan, etc.

**Eriophyes heterothecae** Keifer, new species

## Plate LXXI

Female 150-160 microns long, 45 microns thick, spindleform, light yellow. Rostrum 21.5 microns long, curved down. Shield 25 microns long, 35 microns wide, median line broken, other lines distinct, sides lined and granular; dorsal tubercles 21.5 microns apart, on rear margin; dorsal setae 26 microns long, projecting caudad. Forelegs 28 microns long, patellar seta 25 microns long, tibia 6 microns long, tarsus 7.5 microns long, claw 10.5 microns long, tapering, feather-claw 4 rayed. Hindlegs 23 microns long, patellar seta 10 microns long, tibia 3.5 microns long, tarsus 6 microns long, claw 10 microns long. Sternal line slightly forked; coxal seta III 30 microns long. Abdomen with about 60 rings, there being some ventrad reduction; the microtubercles are spiniferous. Lateral seta a little behind genital seta, 14.5 microns long, on about ring 8; first ventral seta 35 microns long, on about ring 19; second ventral 8.5 microns long, on about ring 36; third ventral 18.5 microns long, 5 rings from rear; caudal seta 45-50 microns long; accessory seta present. Female genitalia 21 microns wide, 13.5 microns long, cover-flap with 10-12 ridges, seta 8.5 microns long.

Male not studied.

**Type locality:** El Monte, Calif. **Collected:** April 25, 1939, by V. E. Williams. **Host:** *Heterotheca grandiflora* Nutt., Telegraph weed. **Relation to host:** The mites are found at the leaf bases and in the hairs. **Type slide:** So designated, with the above data. **Paratype slides:** Five in number, so designated, with the above data.

This species differs from *spinulifera* and *haplopappi* by having a four-rayed feather-claw. I am indebted to V. E. Williams for sending me the material.

**Eriophyes haplopappi** Keifer, new species

## Plate LXXII

Female 125-150 microns long, 40-55 microns thick; light yellowish, rather thick spindleform. Rostrum 25 microns long, projecting down. Shield 25-30 microns long, 35-45 microns wide, median line visible to rear, admedian lines complete, submedian indistinct, a pair of lateral lines and lateral granular band; dorsal tubercles 24 microns apart, on rear margin; dorsal setae 15 microns long, projecting caudad. Forelegs 26 microns long, patellar seta 20 microns long, tibia 5 microns long, tarsus 8.5 microns long, claw 10 microns long, knobbed, feather-claw 5 rayed. Hindlegs 45 microns long, patellar seta 8 microns long, tibia 3.5 microns long, tarsus 8.5 microns long, claw 9.5 microns long. Coxae with short unforked sternal line; coxal seta III 32 microns long. Abdomen with 50-55 rings, some ventrad reduction; the microtubercles are each produced into a short spine. Lateral seta above genital seta, 18 microns long, on about ring 9; first ventral seta 33 microns long, on about ring 20; second ventral 11 microns long, on about ring 32; third ventral 19 microns long, 5 rings from rear; caudal seta about 50-55 microns long; accessory seta present. Female genitalia 22 microns wide, 14 microns long, coverflap with 10-12 ridges, seta 20 microns long.

Male 110-130 microns long, 40 microns thick. Male genitalia 20 microns wide, 13 microns long, seta 13 microns long.

**Type locality:** Harbor City, Los Angeles, California. **Collected:** Apr. 6, 1939, by L. E. Myers. **Host:** *Haplopappus venetus* H. B. K. (*Isocoma veneta*). **Relation to host:** The plant is an Asteraceous composite with viscid leaves and stems. The newer and the terminal leaves are more sticky than those at the base of the current growth. The mites can not, therefore, inhabit the terminal buds and are found near the base of the current growth in the axils of the leaves, where there is a minimum of viscosity. The mite is a bud-mite and lives concealed. It does no apparent damage. **Type slide:** So designated, of mites bearing the above data. **Paratype slides:** Three in number, as above.

This species is very similar to *Eriophyes spinulifera* K. and *heterothecae*. It is, however, more robust, smaller with usually shorter setae, and with a slightly different shield design. The spinules are hard to discern except edge-wise. I am indebted to L. Emory Myers for sending me these mites.

**Eriophyes calibaccharis** Kiefer, new species

## Plate LXXIII

Female 180-200 microns long, 50 microns thick, wormlike, light yellow. Rostrum 55 microns long, bent down. Shield 30 microns long, 44 microns wide, median line short, admedians and submedians distinct; sides granular; dorsal tubercles 26 microns apart, on rear margin; dorsal setae 30 microns long, projecting caudad. Forelegs 30.5 microns long, patellar seta 21.5 microns long, tibia 7 microns long, tarsus 8 microns long, claw 7 microns long, knobbed, featherclaw 5 rayed. Hindlegs 27 microns long, patellar seta 11 microns long, tibia 5.5 microns long, tarsus 7 microns long, claw 7.5 microns long. Sternal ridge faintly forked; coxal seta III 36 microns long. Abdomen with 50-53 rings, the microtubercles acuminate, forming a short spine; dorsal rear with less distinct microtubercles. Lateral seta above genital seta 27.5 microns long, on about ring 6; first ventral seta 20 microns long, on about ring 15; second ventral 4 microns long, on about ring 28; third ventral 23.5 microns long, 6 rings from rear; caudal seta 53 microns long; accessory seta present. Female genitalia 22.5 microns wide, 16 microns long, cover-flap with about 10 ridges, seta 9 microns long.

Male 160-170 microns long, 50 microns thick. Male genitalia 20.5 microns wide, 16.5 microns long, seta 9 microns long.

**Type locality:** Palo Alto, Calif. (Stanford University Campus). **Collected:** Apr. 15, 1939, by the writer. **Host:** *Baccharis pilularis* D. C., Chaparral Broom. **Relation to host:** The new growth of Chaparral Broom is somewhat viscid, so the mites must remain on the lower part of this new growth. They are found in the leaf axils around

the buds. **Type slide:** So designated, with the above data. **Paratype slides:** Two in number, with the above data.

This mite does not seem to be close to the *artemisiae* complex, though it is of the same general type. The shield pattern and microtubercles are likely the most characteristic features in this case.

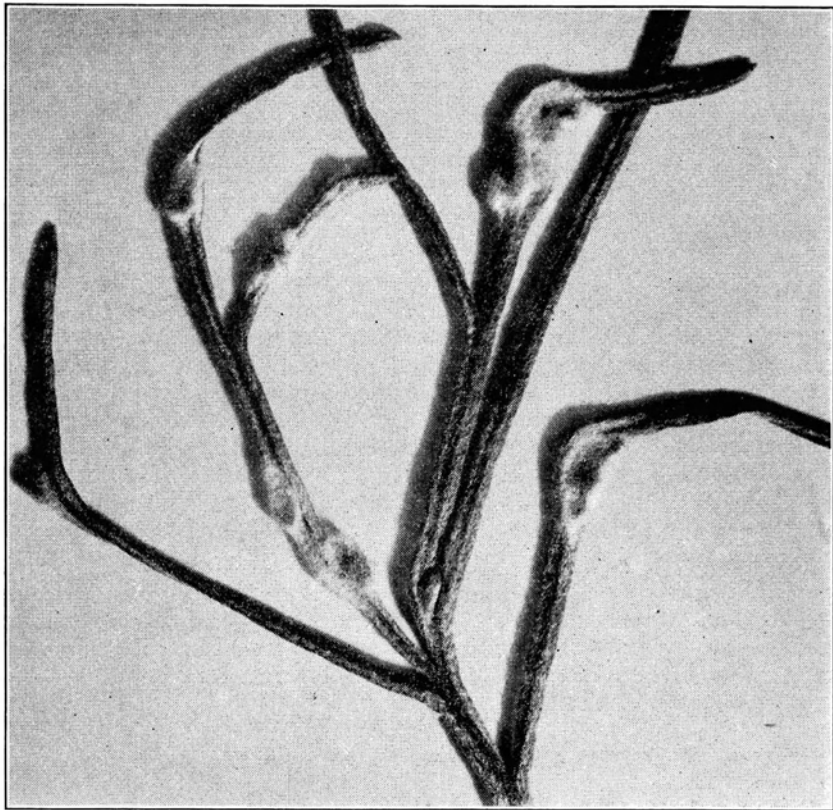


FIG. 7. Leaf Erineum on *Artemisia californica* caused by *Eriophyes paracalifornicus*.

### ***Eriophyes paracalifornicus* Keifer, new species**

#### Plate LXXIV, Fig. 7

Female about 200 microns long, 40 microns thick, wormlike, light yellowish. Rostrum 20 microns long, somewhat bent down. Shield 24 microns long, 32 microns wide, median line broken or entire, admedian and submedian lines strong; sides with some short dashes; dorsal tubercles 20 microns apart, on rear margin; dorsal setae 42 microns long, projecting caudad. Forelegs 26 microns long, patellar seta 24 microns long, tibia 5.5 microns long, tarsus 8.5 microns long, claw 8.5 microns long, slightly knobbed, featherclaw 4 rayed. Hindlegs 22.5 microns long, patellar seta 13.5 microns long, tibia 4.5 microns long, tarsus 7.5 microns long, claw 8.75 microns long. Sternal line slightly forked; coxal seta III 28 microns long. Abdomen with about 70 rings, some ventrad reduction, the microtubercles slightly conical and pointed. Lateral seta above genital seta, 12 microns long, on about ring 9; first ventral seta 45 microns long, on about ring 22; second ventral 12 microns long, on about ring 37; third ventral 20 microns long, 7 rings from rear; caudal seta 73 microns long; accessory seta present. Female genitalia 17 microns wide, 11 microns long, coverflap with no ridges, seta 12 microns long.

Male 180 microns long, 38 microns thick. Male genitalia 14.5 microns wide, 11 microns long, seta 12 microns long.

**Type locality:** Berkeley, Calif. **Collected:** May 3, 1939, by the writer. **Host:** *Artemisia californica* Less. **Relation to host:** The mite forms hairy thickenings on the leaflets. These thickenings have one or more brownish centers. The mites live among the hairs. **Type slide:** So designated, with the above data. **Paratype slides:** One slide, with the above data. Specimens are also on hand from Westwood, Los Angeles, Calif., collected in galls Apr. 16 by Nathan Stahler. Three paratype slides are with this latter data.

In 1910 H. V. M. Hall described a mite as *Eriophyes californicus* from this *Artemisia* and ascribed to it the formation of the above described leaf galls. The figure and description of this mite, while leaving much to be desired, indicates that it is a *Paraphytoptus*. Accordingly, the *Paraphytoptus* collected on this host at Berkeley is considered as the species *californicus*, and is treated further along in this paper. This situation then has left the true gall former undescribed up to the present.

This gall former is in the *artemisiae* group of species. It differs from *neoartemisiae* Keifer partly by the shield pattern, also by the tuberculation on the dorsal rear, and the smooth female genital coverflap.

### ***Eriophyes dracunculi* Keifer, new species**

#### Plate LXXV

Female 220-270 microns long, 40-55 microns thick, light yellowish, wormlike. Rostrum 20 microns long, projecting forward and a little down. Shield 26 microns long, 29 microns wide, median line present to rear; admedian lines complete, first submedian lines about  $\frac{1}{2}$  length of admedians; side with lines and dashes; dorsal tubercles 16 microns apart, on rear margin; dorsal setae 48 microns long, projecting caudad. Forelegs 30 microns long, patellar seta 25 microns long, tibia 6.75 microns long, tarsus 10 microns long, claw 10 microns long, slightly knobbed, featherclaw 4 rayed. Hindlegs 27 microns long, patellar seta 7 microns long, tibia 5.5 microns long, tarsus 7.75 microns long, claw 10 microns long. Sternal line unforked; coxal seta III 36 microns long. Abdomen with 70-80 rings, principal reduction ventrad, microtubercles somewhat conical but apparently not acuminate. Lateral seta a little behind genital seta, 15 microns long, on about ring 8; first ventral seta 37 microns long, on about ring 20-23; second ventral 12 microns long, on about ring 37-41; third ventral 20 microns long, about 7 rings from rear; caudal seta 83 microns long; accessory seta present. Female genitalia 16 microns wide, 11 microns long, coverflap with 8-10 ridges, seta 12 microns long.

Male not studied.

**Type locality:** Near Big Bear Lake, San Bernardino County, Calif. **Collected:** October 12, 1938, by the writer. **Host:** *Artemisia dracunculus* L. **Relation to host:** The mites produce a severely stunted and thickened condition of the shoots, forming a ball-like structure, set thickly with aborted leaves and flowers. **Type slide:** So designated, of mites with the above data. **Paratype slides:** Four in number, as above. There also are many mites in the preserving jar.

There are two forms of mites in this series, a larger more robust type and a smaller, more slender form. The side view, dorsal view of shield, featherclaw and genitalia are from the latter type, with the remainder from the larger type. The markings and other considerations are the same. This is another species projected into the *artemisiae* complex. It is distinct from other California forms examined by the writer. *Eriophyes artemisiae subtilis* Nal. forms similar galls on *Artemisia campestris* L. in Europe.

**Eriophyes neocynarae** Keifer, new species

## Plate LXXVI

Female about 160 microns long, 50 microns thick. Robust, wormlike, light yellow. Rostrum 26 microns long, rather small, projecting downward. Shield 35 microns long, 40 microns wide, disc with 3 central lines, the sides strongly granulate with a central whorl. Dorsal tubercles 26 microns apart, on rear margin; dorsal setae 54 microns long, projecting backward. Forelegs 40 microns long, patellar seta 30 microns long, tibia 10 microns long, tarsus 11.5 microns long, claw 10.5 microns long, knobbed, featherclaw 6 rayed. Hindlegs 38 microns long, patellar seta 18 microns long, tibia 8 microns long, tarsus 10 microns long, claw 12 microns long. Sternal line weakly forked behind. Coxal seta III 53 microns long. Abdomen with about 100 rings, the rings decrease a little in number dorsad, with the dorsal rings to the rear becoming broader and with elongate finer microtubercles, the caudal microtubercles as fine striae slightly produced as spines. Lateral seta above genital seta, 26 microns long, on about ring 13; first ventral seta 85 microns long, on about ring 34; second ventral 24 microns long, on about ring 53; third ventral 24 microns long, 6 rings from rear; caudal seta 115 microns long; accessory seta present. The third ventral seta is unusually strong. Female genitalia 25 microns wide, 16 microns long, coverflap with about 24 ridges, seta 23 microns long.

Male about 150 microns long, 40 microns thick. Male genitalia 20 microns wide, 13 microns long, seta 13 microns long.

**Type locality:** Colma, San Mateo County, Calif. **Collected:** Feb. 12, 1939, by the writer. **Host:** *Cynara scolymus* L., Artichoke. **Relation to host:** The mites are vagrants among the hairs on the undersides of the leaves. They cause no apparent damage. **Type slide:** So designated of mites with the above data. **Paratype slides:** Four in number, with the above data.

The species is characterized by the whorl on the shield sides, the striations on the female coverflap and the extra strong third ventral seta. It leads a *Paraphytoptus* type of existence and shows some ventrad increase in rings especially caudad. The European *E. cynarae* Corti is said to have 70 body rings, a 5-rayed featherclaw, and about 12 ridges on the female coverflap. These would seem to be sufficient differences. The new species probably came over to artichoke in California from some other related Composite.

**Eriophyes malpighianus** (C. & M.)

## Plate LXXVII

Canestrini and Massalongo—Bul. Soc. Veneto-Trent. Vol. 5, p. 127, 1893.

Nalepa—Zoologica, Vol. 24, p. 224, 1911.

Nalepa—Marcellia, Vol. 25, p. 95, 1929.

Female 140-160 microns long, 35 microns thick, whitish, elongate, spindleform. Rostrum 29 microns long, projecting down. Shield 29 microns long, 32 microns wide, prominently arched, median, admedian and submedian lines distinct in disc with interspersed fine lines; sides heavily granulate; dorsal tubercles and setae missing. Forelegs 27-29 microns long, patellar seta 21 microns long, tibia 7.5 microns long, tarsus 6.5 microns long, claw 6 microns long, slightly knobbed, featherclaw 5 rayed. Hindlegs 24 microns long, patellar seta 4.5 microns long, tibia 6 microns long, tarsus 6.5 microns long, claw 7 microns long. Anterior coxae touching; coxal seta III 21 microns long. Abdomen with about 70 rings, the rings rather narrow with probably more dorsad than ventrad reduction; the microtubercles small. Lateral seta rather high and a little ahead of genital seta; 17 microns long, on about ring 6; first ventral seta 60 microns long, on about ring 21; second ventral 6 microns long, on about ring 38; third ventral 12 microns long, 5 rings from rear; caudal seta 35-40 microns long; accessory seta absent. Female genitalia pushed up closer to coxae than usual, somewhat projecting, 22 microns wide, 11 microns long, coverflap with 18-20 partly broken ridges, seta 5.5 microns long.

Male not studied.

**Locality:** Sacramento, Calif. **Collected:** Apr. 6, 21 and 27, 1939, by the writer. **Host:** *Laurus nobilis* L. **Relation to host:** The mites were found in the buds where slight browning may occur. They are said to deform the flowers.

This mite is known from the Mediterranean region, where it was originally described. Nalepa's account of it in the Zoologica is at



variance with the present description: the mite there described is stated to be longer, has more body rings, and but a 4-rayed feather-claw. These are important differences and would constitute ample grounds for specific separation if they can not be changed by further study. The lack of dorsal shield setae and the type of shield pattern agree, however, as does the host. The female genitalia of this mite are similar to those of *Gammaphytoptus camphorae* K. This latter mite by standard characters should have nothing in common with *malpighianus* except that its host, Camphor, is also in the Lauraceae. Thus we have another case of either true relationship or very peculiar convergence. It should be noted that the figures of the anterior apodeme of the female genitalia (AP1) in both *malpighianus* and *camphorae* are of the style they are because the genitalia are somewhat projected from the body surface, giving the apodeme a more vertical position.

### **Eriophyes magnoliae** Keifer, new species

#### Plate LXXVIII

Female 170-210 microns long, 50 microns thick. Somewhat elongate, worm-like, pinkish to yellow-pink. Rostrum 42 microns long, bent down. Shield 37 microns long, 43 microns wide; disc with admedian lines outcurved posteriorly, two definite submedian lines present; sides granular; dorsal tubercles 22 microns apart, on rear margin; dorsal setae 16 microns long, projecting caudad. Forelegs 34 microns long, patellar seta 27 microns long, tibia 6.5 microns long, tarsus 8.5 microns long, claw 8.5 microns long, tapering, featherclaw 6 rayed. Hindlegs 33 microns long, patellar seta 13 microns long, tibia 6.5 microns long, tarsus 8 microns long, claw 9 microns long. A short sternal line present; coxal seta III 35 microns long. Abdomen with 70-75 rings. There is ring reduction both dorsad and ventrad; it seems to be strongest dorsad, especially toward the rear. Lateral seta above genital seta, 20 microns long, on about ring 7; first ventral seta 40 microns long, on about ring 21; second ventral 39 microns long, on about ring 39; third ventral 25 microns long, 6 rings from rear; caudal seta 60 microns long; accessory seta present. Female genitalia 22 microns wide, 12 microns long, coverflap with about 7 ridges and a deep notch, seta 13 microns long.

Male not seen.

**Type locality:** Sacramento, Calif. **Collected:** Mar. 2, 3 and 4, 1939, by the writer. **Host:** *Magnolia fraseri* Walt. **Relation to host:** The mites were collected from the hairy flower buds just previous to bud opening. They were on the surface at the base of the hair. No damage was noted. **Type slide:** With above data, collected on Mar. 3, 1939. **Paratype slides:** Six in number, as above.

The mite is quite variable in ring number from the dorsal to the ventral side. Some specimens appear similar to *Paraphytoptus*. The habitat of this mite in the surface hairs is similar to the habitat of *Paraphytoptus* species on Composites. The diverging submedian shield lines, unusually long second ventral seta, and deeply notched female genital coverflap also characterize this mite. This is the first *Eriophyid* listed from *Magnolia*.

### **Paraphytoptus californicus** (Hall)

#### Plate LXXIX

Hall, H. V. M., Pomona Jr. Ent., Vol. 2, No. 3, p. 280, Sept. 1910, as *Eriophyes californicus*.

Hall, Pomona Jr. Ent., Vol. 3, p. 55, 1911, as *Paraphytoptus californicus*.

Essig, Insects Wn. N. Am., p. 49, 1926, as *Phyllocoptes californicus*.

Nalepa, Marcellia, Vol. 25, p. 157, 1929, as *Paraphytoptus californicus*.

Female 150-180 microns long, 40-45 microns thick; somewhat wormlike, light yellow to amber. Rostrum 26 microns long, bent down. Shield 24 microns long, 35 microns wide, disc with all usual lines distinct, sides with diagonal lines and a narrow

granular area above coxae; dorsal tubercles 18.5 microns apart, on rear margin; dorsal setae 32 microns long, projecting caudad. Forelegs 29 microns long, patellar seta 23 microns long, tibia 5.75 microns long, tarsus 7 microns long, claw 8 microns long, slightly knobbed, featherclaw 5 rayed. Hindlegs 26 microns long, patellar seta 12 microns long, tibia 5.25 microns long, tarsus 6 microns long, claw, 8.75 microns long. Sternal line slightly forked; coxal setae III 40 microns long. Abdomen about evenly ringed on the anterior third, the tubercles somewhat elongate; the broader posterior tergites irregular, with the tubercles forming serrate edges; tergites about 33, the reduction beginning about tergite 15-18, sternites 60-65. Lateral seta a little behind genital seta, 11.5 microns long, on about sternite 9; first ventral 45-46 microns long, on about sternite 22; second ventral 15 microns long, on about sternite 38; third ventral 21 microns long, on about 7th sternite from rear; caudal seta 70 microns long; accessory seta present. Female genitalia 20 microns wide, 12 microns long, coverlap with 10-12 ridges, seta 14 microns long.

Male not studied.

**Locality:** Berkeley, Calif. **Collected:** May 3, 1939, by the writer. **Host:** *Artemisia californica* Less. **Relation to host:** The mite is a vagrant on the stems and leaves. This mite is chiefly characterized by the peculiar roughened and irregular condition of the broader posterior tergites. The status of this species has been discussed under *Eriophyes paracalifornicus*. While the individuals on which this philosophy is based are not from the same area from which the mite was originally described, it seems reasonable to assign the name *californicus* Hall to them.

### *Calepitrimerus umbellulariae* Keifer, new species

#### Plate LXXX

Female 140-160 microns long, 50 microns wide, 40-45 microns thick elongate spindleform, light yellow. Rostrum 29 microns long, projecting down. Shield 38 microns long, 40 microns wide, the anterior lobe a little overlying rostrum, admedian lines present on each side of a central longitudinal ridge, sides somewhat granular; dorsal tubercles 16 microns apart, projecting fingerlike; dorsal setae 26.5 microns long, directed anteriorly. Forelegs 32 microns long, patellar seta 22 microns long, tibia 8.5 microns long, tarsus 8 microns long, claw 8.5 microns long, curved, slightly knobbed featherclaw 5 rayed. Hindlegs 29 microns long, patellar seta 9 microns long, tibia 6 microns long, tarsus 7 microns long, claw 8 microns long. Anterior coxae contiguous; coxal seta III 35 microns long. Abdominal dorsum shallowly longitudinally concave, a ridge on each side, also a central ridge from shield ending on about tergite 37, faint lines of wax along the dorsal ridges; tergites 50-55, sternites about 70. Lateral seta 17.5 microns long, on about sternite 6; first ventral 52 microns long, on about sternite 20; second ventral 22 microns long, on about sternite 42; third ventral 30 microns long, on about 7th sternite from rear; caudal seta about 50 microns long; accessory seta present. Female genitalia 23 microns wide, 13.5 microns long, coverlap with 14-18 ridges, seta 18.5 microns long.

Male 130 microns long, 45 microns wide, 40 microns thick. Male genitalia 18 microns wide, 13.5 microns long, seta 18.5 microns long.

**Type locality:** Sacramento, Calif. **Collected:** May 5 and 9, 1939, by the writer. **Host:** *Umbellularia californica* Nutt, California Laurel. **Relation to host:** The mites are found in the buds, or in the hairs at the base of the new spring growth. **Type slides:** So designated, with the above data and collected May 9. **Paratype slides:** One paratype slide collected on May 5. Two paratype slides of mites collected on this host at Berkeley, May 3, 1939, by the writer.

This species is distinguished from other members of *Calepitrimerus* by the finger-like dorsal tubercles.

### *Tumescoptes* Keifer, new genus

Body generally flattened. Rostrum small. Shield broad, an anterior lobe projecting well over rostrum. Legs rather slender, femoral setae missing, featherclaws bifurcate. Abdomen with sternites more numerous than tergites; shortly behind the shield a lateral expansion, as broad as the shield, interrupting the tergites

for about a quarter of the abdominal length; first and second ventral setae missing. Female genital coverflap with many fine striae.

Genotype: *Tumescoptes trachycarpi* n. sp.

The principal features of this genus are the expanded area of the abdomen and the bifurcate featherclaws. The expanded anterior portion of the abdomen has no known counterpart elsewhere in the Eriophyidae. The bifurcate featherclaw and type of female genital apodeme are similar to *Diptilomiopus*, but the rostrum is not similar. The general structure of the genotype suggests *Oxypleurites*, but there seems no near relationship. The genus keys to the Phyllocoptinae but can be immediately distinguished from all other genera by the general body shape.

### **Tumescoptes trachycarpi** Keifer, new species

#### Plate LXXXI

Female up to 170 microns long, 70 microns wide, 40 microns thick, light yellow, flat, in dorsal view anterior half broad, constricted a little centrally, the posterior half strongly tapering. Rostrum 26 microns long, projecting down, with very large subapical setae. Shield 59 microns long 65 microns wide, with an open network of lines, anterior lobe well over rostrum and transversely ridged anteriorly; sides granular; dorsal tubercles 17.5 microns apart, well ahead of rear margin; dorsal setae 4.5 microns long, projecting dorso-centrad. Forelegs 35 microns long, femoral seta missing, patellar seta 29 microns long, tibia 5.5 microns long, tarsus 9 microns long, claw 5.5 microns long, straight, with large knob, feather-claw deeply cleft, apparently 3-rayed. Hindlegs 29 microns long, femoral seta missing, patellar seta missing, tibia 4 microns long, tarsus 7.5 microns long, claw 5.25 microns long. Anterior coxae apparently separate; coxal setae III 30 microns long. Abdomen with tergites smooth, the microtubercles on the sternites very small; tergites, about 4 ahead of tumescence, about 21 behind; about 60 sternites posterior to genitalia. Lateral seta a little ahead of and lateral to genital seta, 25 microns long, first ventral seta absent, second ventral seta absent, third ventral 23.5 microns long, on about sternite 5 from rear; caudal seta 28 microns long; accessory setae absent. Female genitalia 23 microns wide, 18 microns long; coverflap with many fine ridges, seta 7 microns long.

Male 150 microns long, 60 microns wide, 30 microns thick. Male genitalia 17.5 microns wide, 14 microns long, seta 7.5 microns long.

**Type locality:** San Francisco—?, the palm intercepted in Woodland from Hallawell Seed Co., San Francisco. **Collected:** Chas. H. Hardy, Agricultural Commissioner of Yolo County, intercepted the palm, May 9, 1939. **Host:** *Trachycarpus excelsa* Wendl., Windmill Palm. **Relation to host:** The mites are found in the folded leaves but cause no damage. Their flat shape enables them to live between the lamellae of these unexpanded leaves. **Type slide:** So designated, with above data. **Paratype slides:** Three slides with above data. The mites were discovered by Mrs. Iris Savage, Entomological Laboratory Helper. The exact number of rays in the featherclaw could not be determined with certainty.

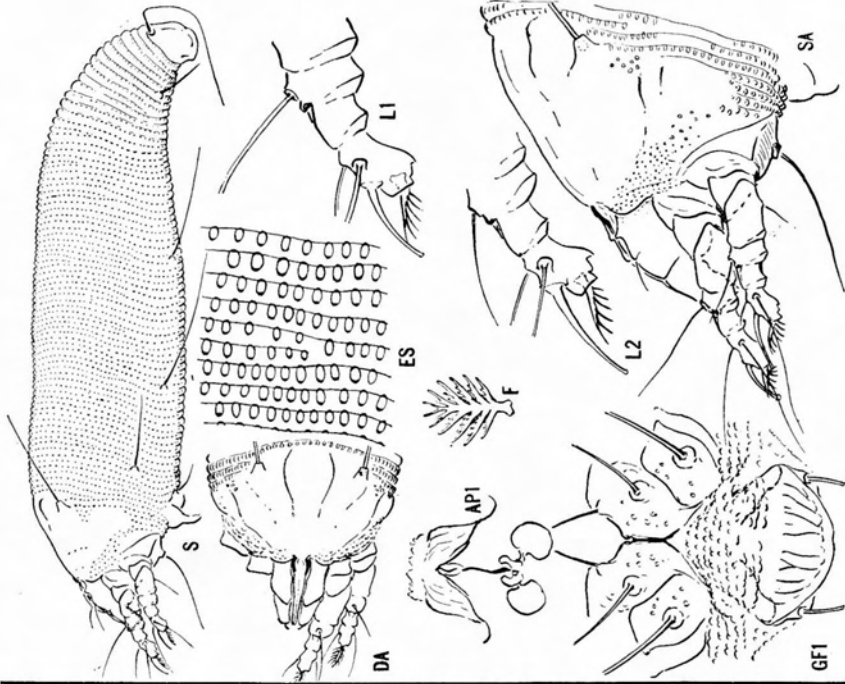


PLATE LXIX. *Eriophyes vaccinii*, n. sp.

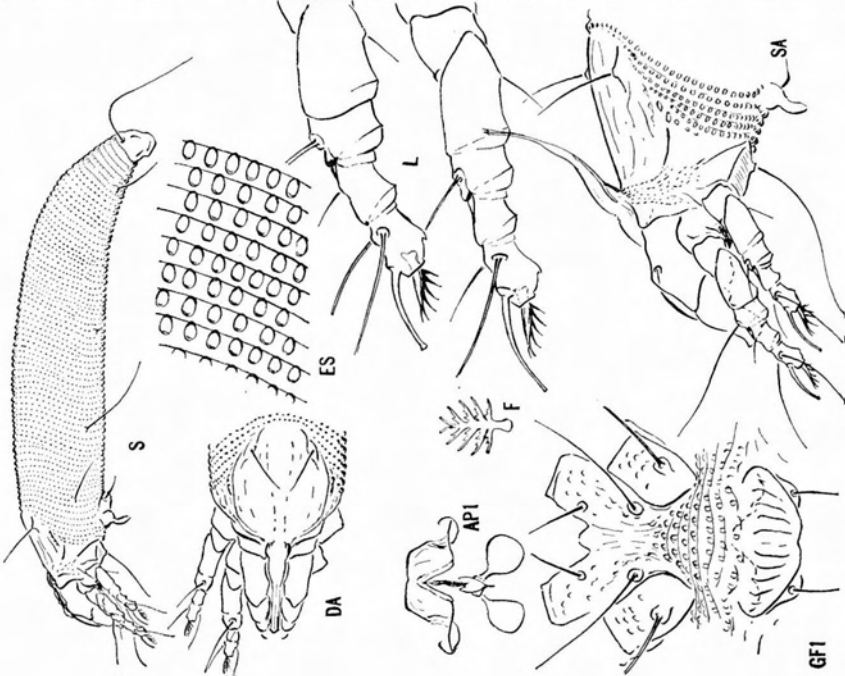


PLATE LXVIII. *Eriophyes wisteriae*, n. sp.

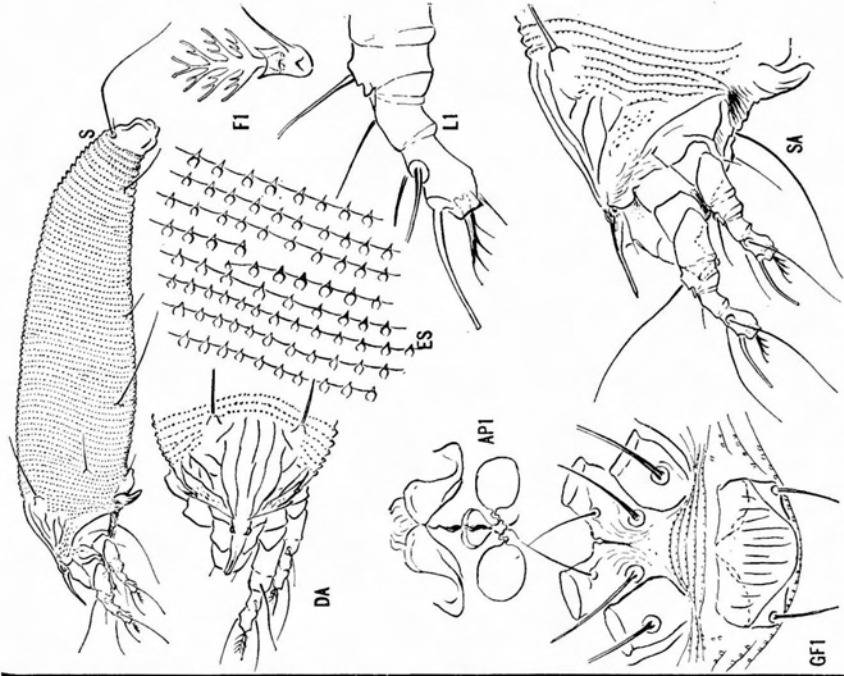


PLATE LXXI. *Eriophyes heterothecae*, n. sp.

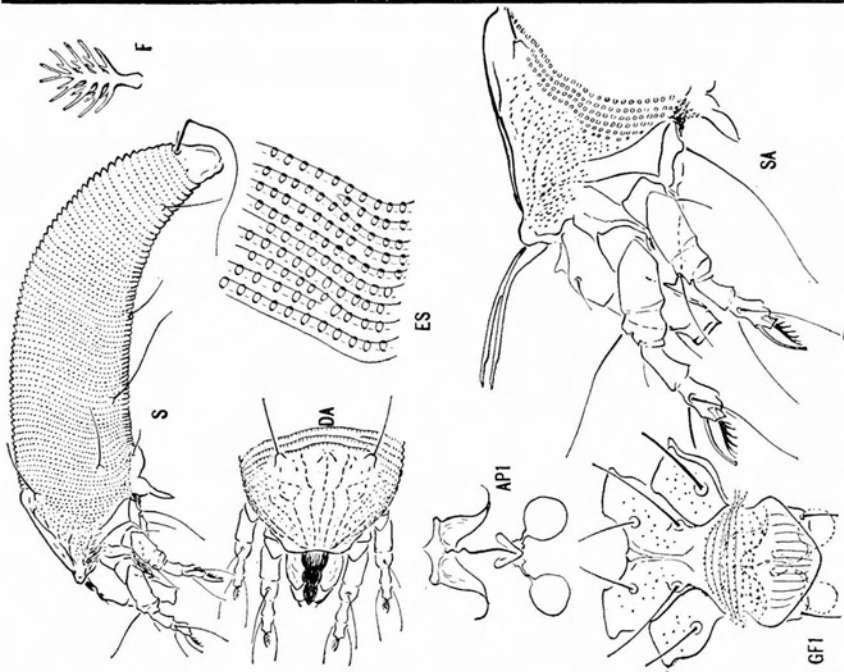


PLATE LXX. *Eriophyes ceanothi*, n. sp.

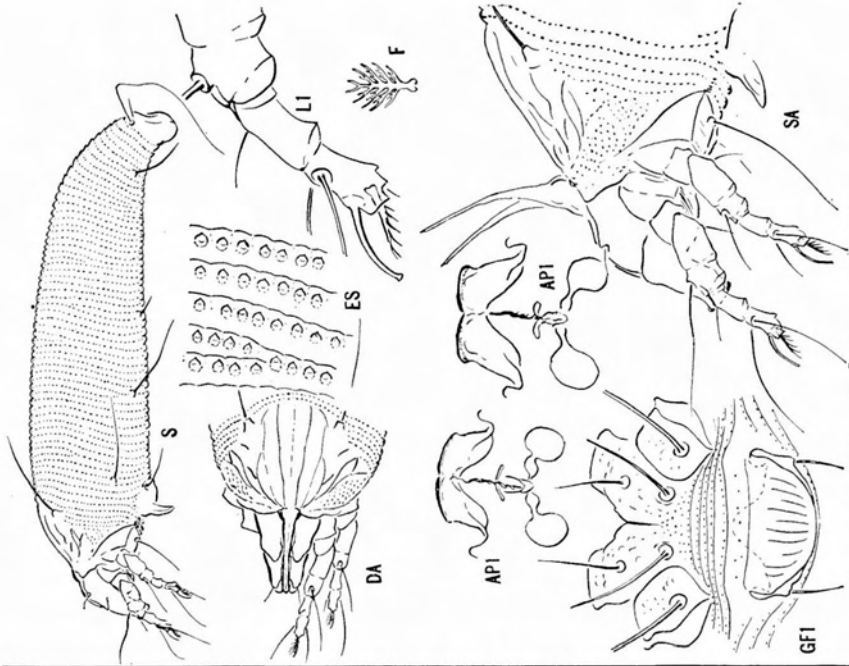


PLATE LXXIII. *Eriophyes calibaccharis*, n. sp.

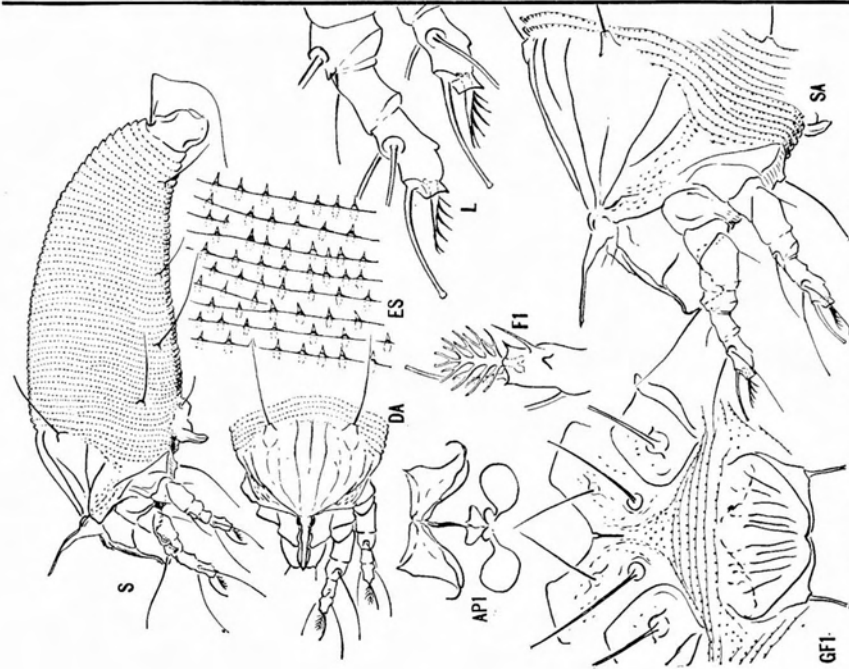


PLATE LXXII. *Eriophyes haplopappi*, n. sp.

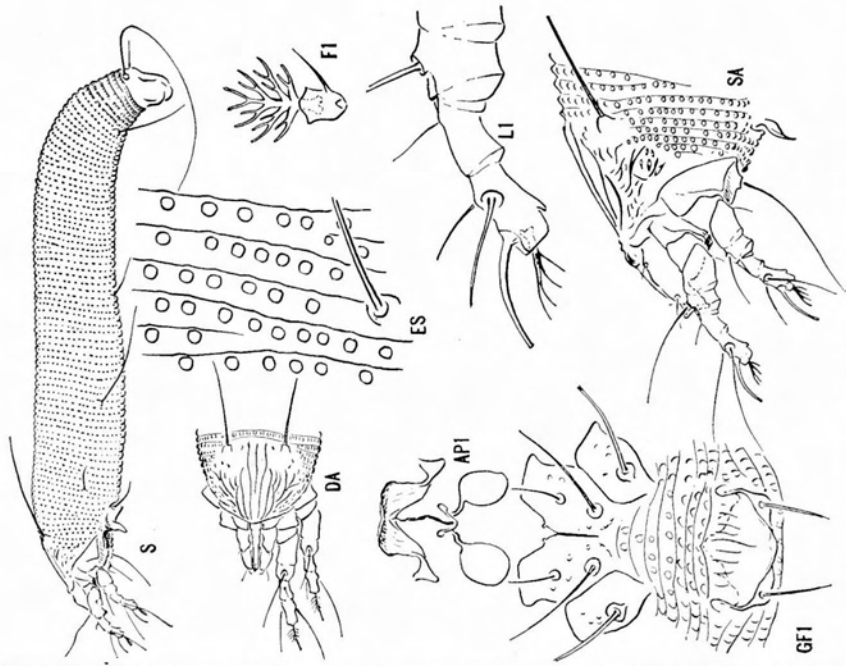


PLATE LXXV. *Eriophyes dracunculi*, n. sp.

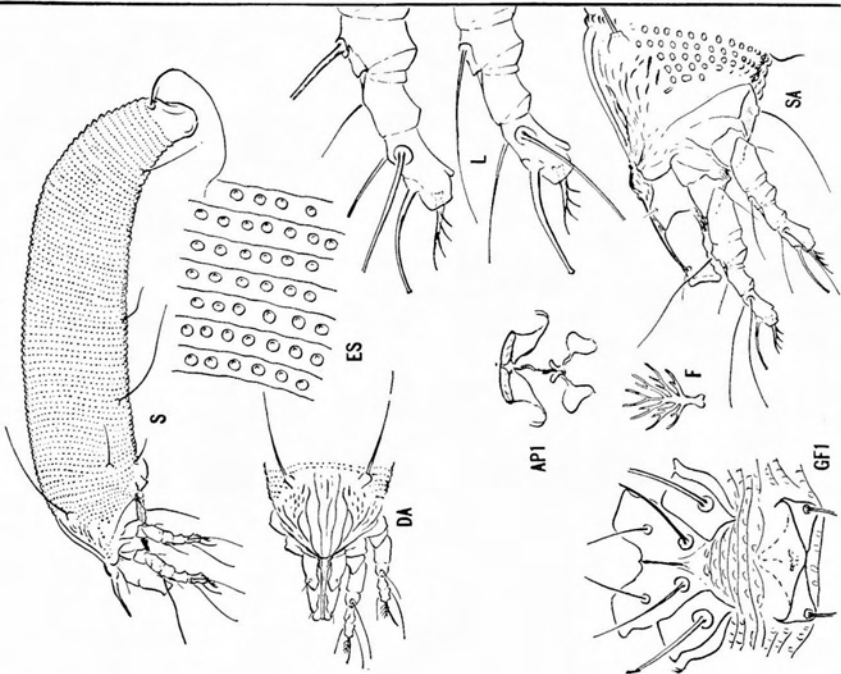


PLATE LXXIV. *Eriophyes paracalifornicus*, n. sp.

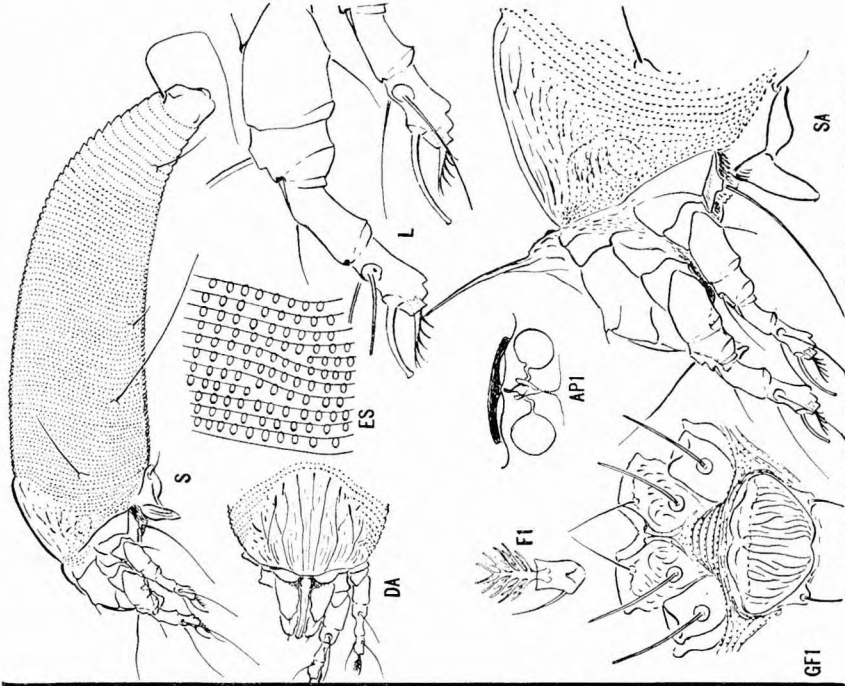


PLATE LXXVII. *Eriophyes matpighianus* (C. & M.).

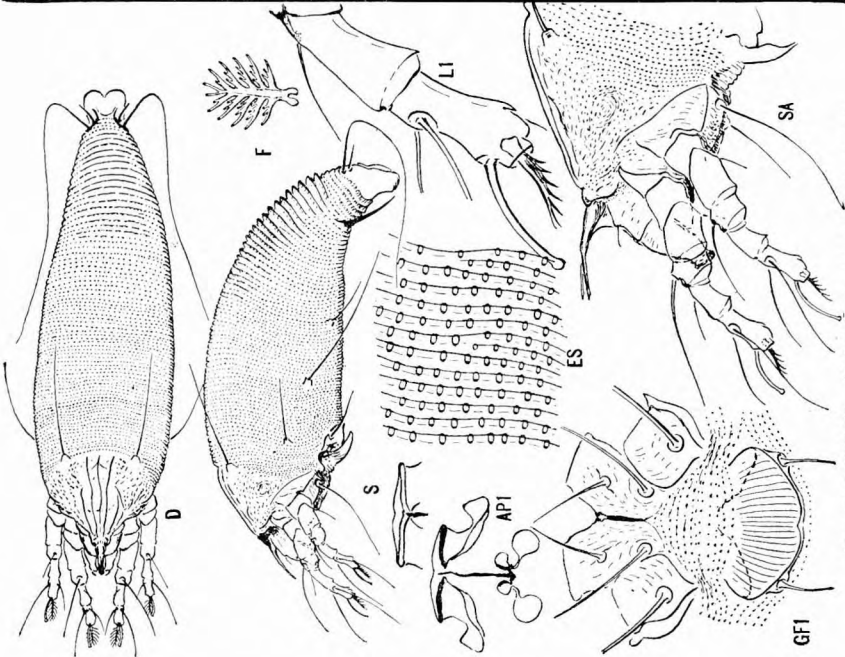


PLATE LXXVI. *Eriophyes neocynarae*, n. sp.



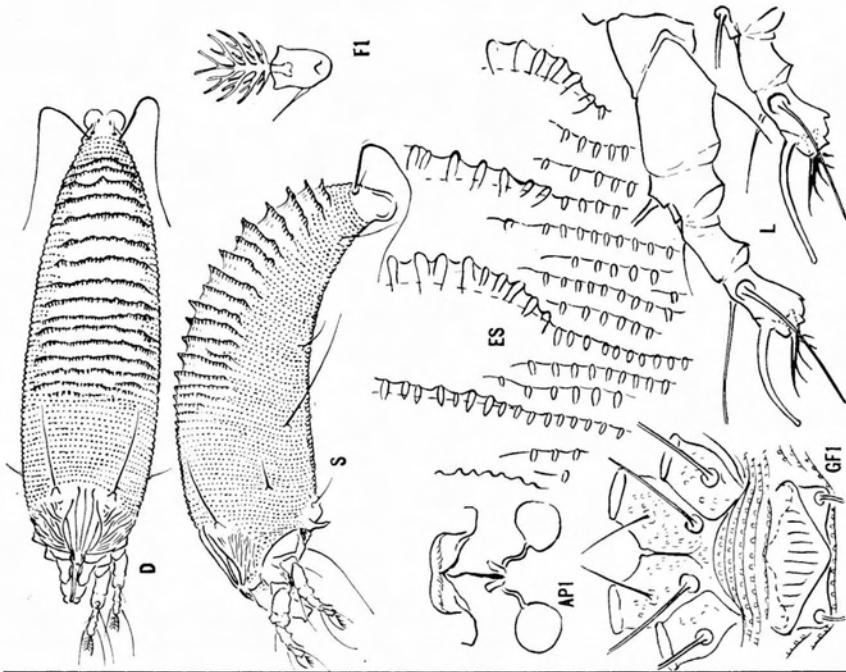


PLATE LXXIX. *Paraphytopus californicus* (Hall).

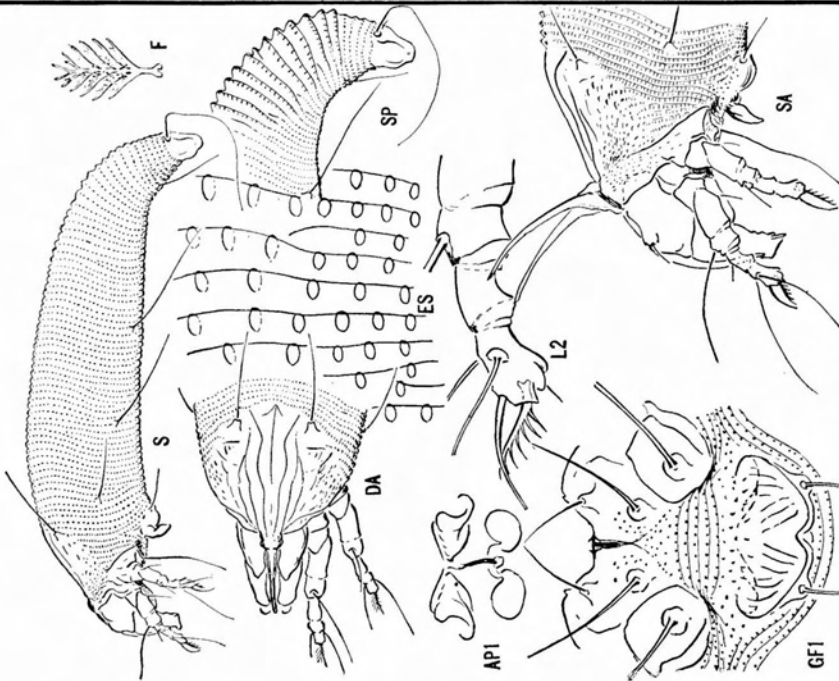


PLATE LXXVIII. *Eriophyes magnoliae*, n. sp.

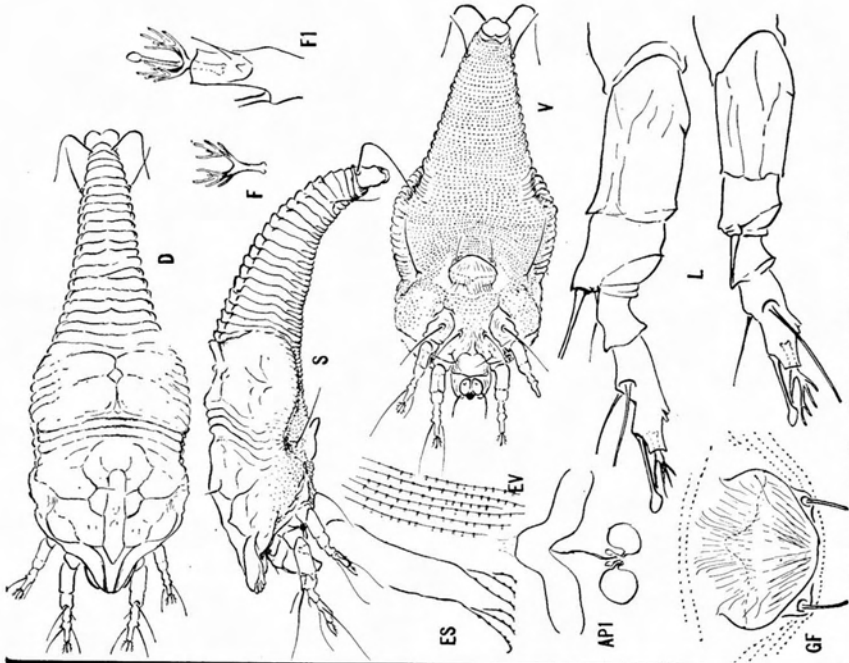


PLATE LXXXI. *Tumescopites trachycarpi*, n. sp.

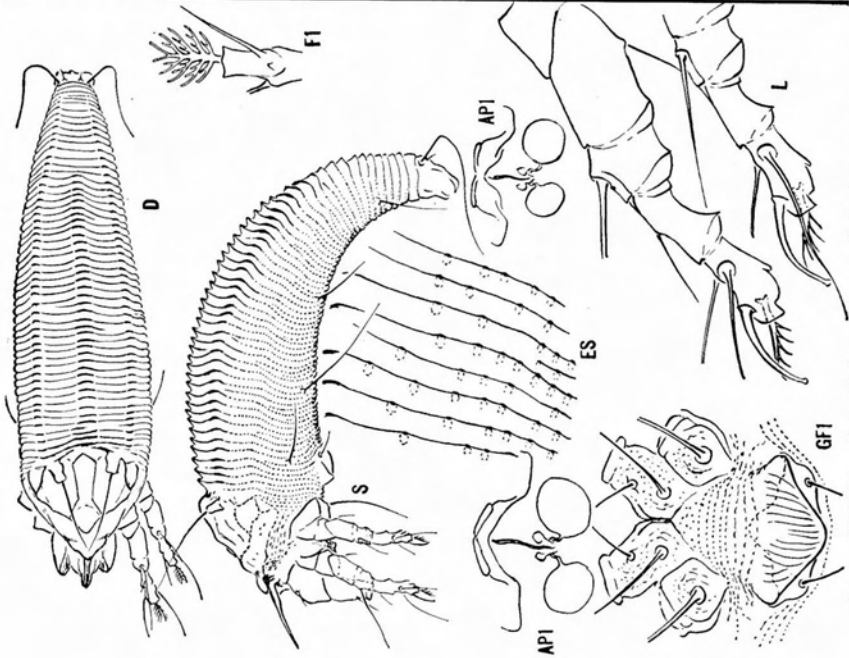


PLATE LXXX. *Catepitrimerus umbellulariae*, n. sp.

## Host List

## Palmaceae

- Trachycarpus excelsa* Wendl.  
*Tumescoptes trachycarpi* n. sp., in folded leaves.

## Lauraceae

- Laurus nobilis* L.  
*Eriophyes malpighianus* (C. & M.), in buds.  
*Umbellularia californica* Nutt.  
*Calepitrimerus umbellulariae* n. sp., in buds and on young stems.

## Magnoliaceae

- Magnolia fraseri* Walt.  
*Eriophyes magnoliae* n. sp., in hair on flower buds.

## Leguminosae

- Wisteria* sp.  
*Eriophyes wisteriae* n. sp., in buds.

## Rhamnaceae

- Ceanothus velutinus* Dougl.  
*Eriophyes ceanothi* n. sp., bead galls on leaf underside.

## Ericaceae

- Vaccinium* sp., hybrid variety Rancocas  
*Eriophyes vaccinii* n. sp., causing bud blasting and discoloration.

## Compositae

- Haplopappus venetus* H. B. K.  
*Eriophyes haplopappi* n. sp., in leaf axils toward base of current growth.  
*Heterotheca grandiflora* Nutt.  
*Eriophyes heterothecae* n. sp., in leaf axils and among hairs.  
*Baccharis pilularis* D. C.  
*Eriophyes calibaccharis* n. sp., in leaf axils toward base of current growth.  
*Artemisia californica* Less.  
*Eriophyes paracalifornicus* n. sp., forming hairy swellings on leaflets.  
*Paraphytoptus californicus* Hall., vagrant on leaves and stems.  
*Artemisia dracunculus* L.  
*Eriophyes dracunculi* n. sp., severe shoot stunting and deformation.  
*Cynara scolymus* L.  
*Eriophyes neocynarae* n. sp., in hair on leaf underside.

## Designations on Plates

- AP1—Interior female genitalia  
D—Dorsal view of mite  
DA—Dorsal view of anterior section of the mite  
ES—Detail of side skin  
EV—Detail of ventral skin  
F—Featherclaw from below  
F1—Featherclaw from below with part or all of the tarsus  
GF—Female genitalia  
GF1—Female genitalia and coxae  
L—Left legs, the foreleg above  
L1—Left foreleg, in this case the three apical segments  
L2—Left hindleg  
S—Side view of mite  
SA—Side view of anterior section of mite  
SP—Side view of posterior section of mite  
V—Ventral view of mite