

OCCASIONAL PAPERS - No: 2

Bureau of Entomology

California Department of Agriculture



CONTENTS

ERIOPHYID STUDIES XXVIII

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DECEMBER 30, 1959

Published By
California Department of Agriculture
Sacramento, California

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by H. H. Kaiser

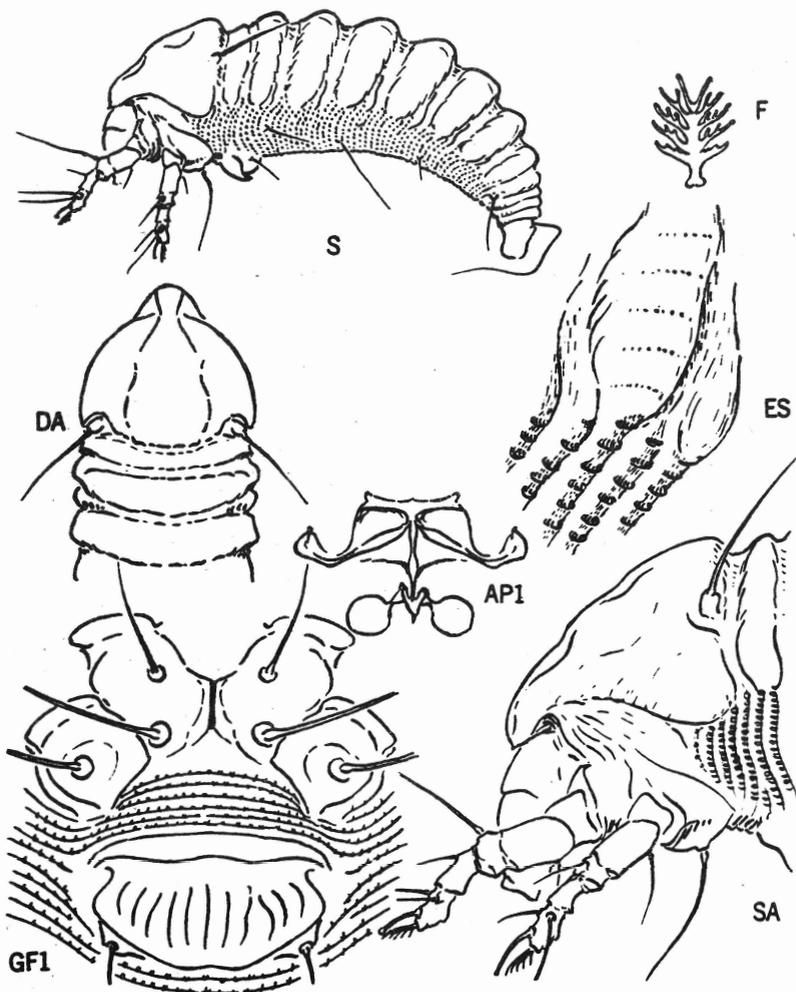


Plate I - *Anthocoptes bakeri*, new species

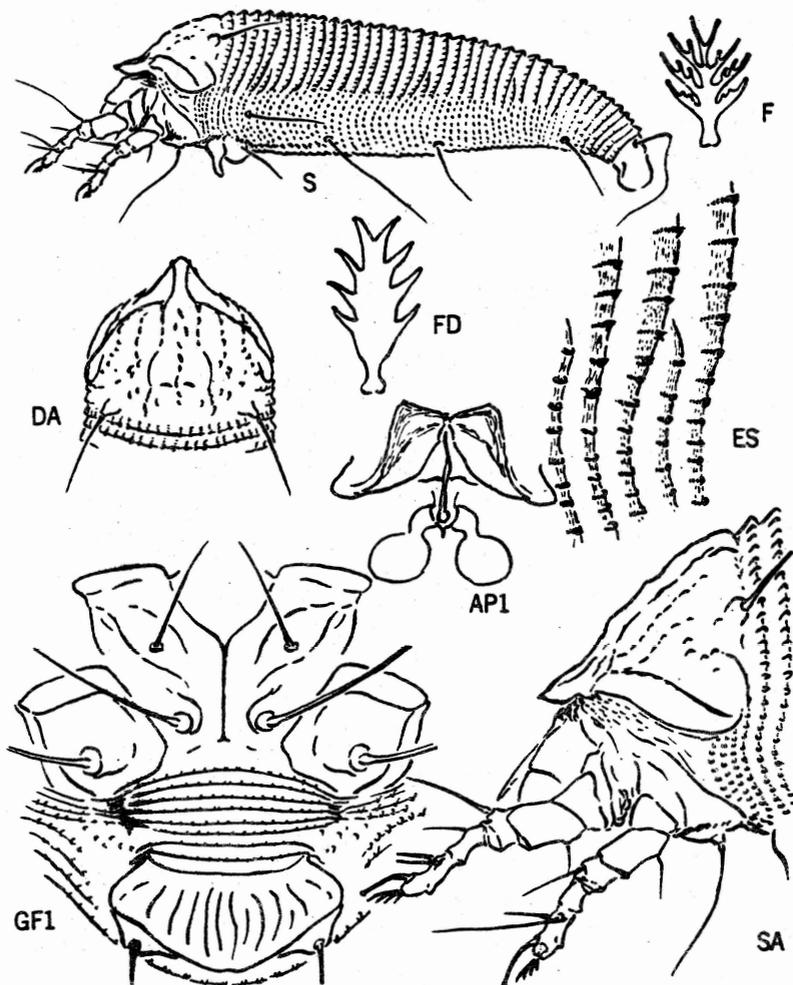
ABSTRACT - Eriophyid Studies XXVIII describes fifteen new species of these mites, of which eleven are from the Maryland-Virginia area: *Anthocoptes bakeri* new species, a rust mite on honey locust, *Gelditsia triacanthos*; *Aculus nigrus* new species, a rust mite on black walnut, *Juglans nigra*; *Aculus grandidentatus* new species, a leaf vagrant on bigtooth aspen, *Populus grandidentata*; *Tetra liriodendronis* new species, a leaf vagrant on tulip tree, *Liriodendron tulipifera*; *Tetra robiniae* new species, a rust mite on black locust, *Robinia pseudoacacia*; *Cecidophyes quercialbae* new species, a leaf vagrant on white oak, *Quercus alba*; *Acaricalus illexopacae* new species, a leaf vagrant on holly, *Ilex opaca*;

Rhyncaphytoptus saccharini new species, leaf vagrant on silver maple, *Acer saccharinum*; *Rhyncaphytoptus albus* new species, leaf vagrant on white oak; *Rhyncaphytoptus atlanticus* new species, leaf vagrant on American elm, *Ulmus americana*; *Diptacus flocculentus*, new species, a leaf vagrant on flowering dogwood, *Cornus florida*. Two species are described from South America: *Phyllocoptes bouganvilleae* new species, a leaf edgeroller on *Bouganvillea spectabilis*; and *Dichopalpus notus* new genus and species, a rust mite on Yerba Maté, *Ilex paraguariensis*. Two new rust mites are described from Citrus in India: *Floracarus fleschneri* new species, on *Citrus reticulata* (mandarin orange); and *Diprilonopus assamica* new species, on lemon, *Citrus limonia*. In addition *Aculus pelekassi* K., originally described from Greece is listed as occurring on Citrus in Thailand, and a short summary of the known Citrus rust mites is included.

ANTHOPTES BAKERI, new species

Plate 1

This is the fourth species of *Anthoptes* known in North America that has a five-rayed featherclaw. It differs from the others by having seven to eight broadly rounded large tergites. The other three species either have more large tergites, or they are sharper, or the shield is more pointed anteriorly. It is a pleasure to name this mite after Dr. E. W. Baker, eminent Acarologist, who collected it on the Campus of the University of Maryland.

Plate 2 - *Aculus nigres*, new species

Female 120 μ -140 μ long, 43 μ wide, 38 μ thick, robust spindleform in shape, dull yellowish in color. Rostrum 27 μ long, projecting down. Shield 40 μ long, 40 μ wide, anterior lobe short and broadly rounded; shield curved laterally with center somewhat raised and outlined, extending from anterior lobe to rear margin and expanding to rear. Dorsal tubercles widely spaced, 32 μ apart, on rear margin; dorsal setae 25 μ long, diverging to rear. Forelegs 28 μ long, tibia 6.5 μ long, the tibial seta 4.5 μ long and arising at basal 1/3; claw 6 μ long, with slight knob; featherclaw 5-rayed. Hindlegs 27 μ long, tibia 5 μ long, tarsus 6.5 μ long, claw 6.5 μ long. Anterior coxae narrowly contiguous centrally; first coxal tubercles further apart than second tubercles; second tubercles ahead of transverse line through third tubercles. About 13 abdominal tergites, the first narrow and depressed followed by seven to nine broad rounded tergites, no microtubercles distinct on tergites; about 50-55 narrow sternites heavily set with elliptical microtubercles touching rear margin of each sternite. Lateral seta 16 μ long, on about sternite 7; first ventral seta 40 μ long, on about sternite 20; second ventral 17 μ long, on about sternite 35; third ventral seta 23 μ long, on sternite 5 from rear. Accessory seta 2.5 μ long. Female genitalia 20 μ wide, 15 μ long; coverflap with 10-12 longitudinal furrows; genital seta 26 μ long.

TYPE LOCALITY - Campus of the University of Maryland, College Park, Md. COLLECTED - July 17, 1959 by Dr. E. W. Baker. HOST - *Gleditsia tricanthos* L. (Leguminosae), honeylocust. RELATION TO HOST - the mites are rust mites living on the undersurfaces of the leaves. TYPE MATERIAL - a type slide and six paratypes bear the above data. This mite occurs in company with *Aculus gleditsiae* (K) (1939) and apparently contributes to considerable leaf damage on many honeylocust trees.

ACULUS NIGRUS, new species

Plate 2

This walnut rust mite belongs to the group in the genus *Aculus* with a pair of small spines on the anterior shield lobe, and with a 4-rayed featherclaw. The small anterior spines are very difficult to see in this case. The principle distinguishing feature of this mite is the strong diagonal line across the lateral shield lobe.

Female 200 μ -220 μ long, 50 μ thick, 60 μ -65 μ wide, fusiform, dull yellow in color. Rostrum 24 μ long, projecting diagonally down. Shield 40 μ long, 62 μ wide, subtriangular; with a moderate up-turned anterior lobe bearing a small pair of spines. Shield design principally of broken lines and short dashes; median line indicated by short dashes on posterior 3/4; admedian lines complete from anterior lobe, sinuate and gradually diverging to rear; one or two submedian lines indicated by dashes; a strong diagonal line from admedian near base on anterior lobe, running posteriorly above lateral shield margin and forming a strong line or carina across lateral lobe. Dorsal tubercles 33 μ apart, on rear margin; dorsal setae 30 μ long, diverging to rear. Forelegs 33 μ long; tibia 7 μ long, with centrally placed seta 8 μ long; tarsus 8 μ long; claw 10 μ long, tapering, slightly knobbed; featherclaw 4-rayed. Hindleg 30 μ long, tibia 5 μ long, tarsus 8 μ long. Coxae with few lines and no granules; anterior coxae contiguous along a moderately long central line; first coxal tubercles well ahead of and a little further apart than second tubercles; second coxal setiferous tubercles ahead of transverse line through third tubercles. Abdomen with about 50 tergites and about 60 sternites; completely microtuberculate, the microtubercles somewhat pointed to rear, elongate, especially dorsally, and reaching rear ring margins. Lateral seta 36 μ long, on about sternite 7; first ventral seta 53 μ long, arising from about sternite 20; second ventral 17 μ long, from about sternite 34; third ventral seta 26 μ long, from about sternite 5 from rear. Accessory seta 5 μ long. Female genitalia 26 μ wide, 19 μ long; coverflap with about 14 longitudinal furrows; genital seta 23 μ long. Male 125 μ -140 μ long, 45 μ thick, 50 μ wide; completely microtuberculate and resembling protogyne. Deutogyne 180 μ -215 μ long, 45 μ -50 μ thick, microtubercles usually absent but present on venter of some specimens; featherclaw 4-rayed, with broad palmate center.

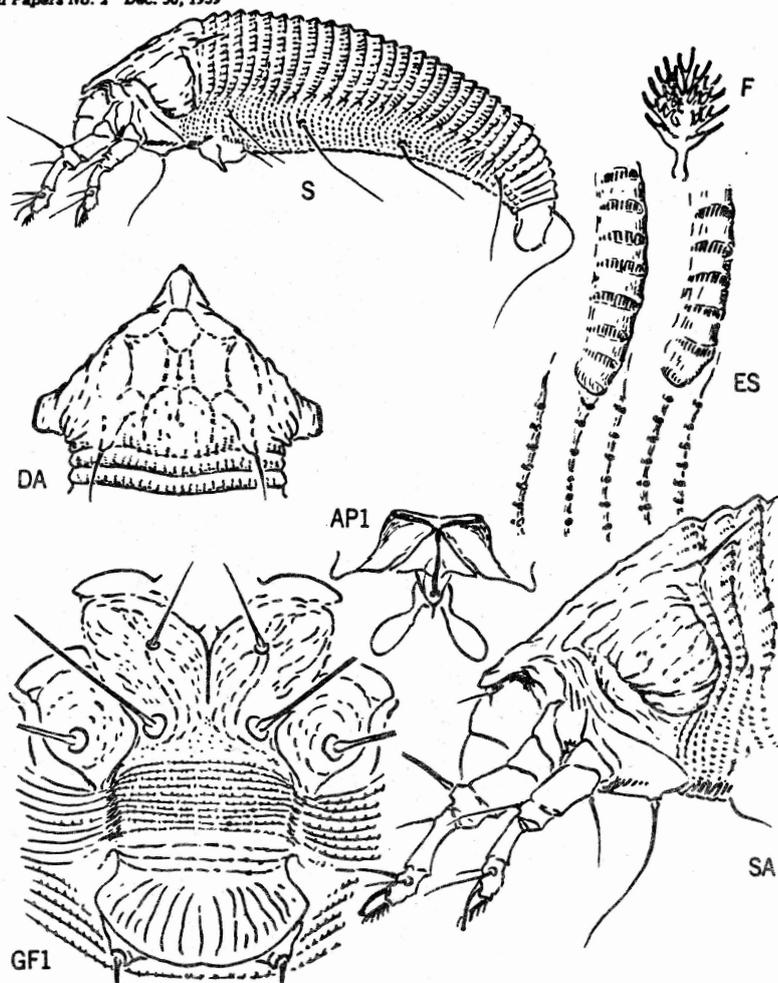
TYPE LOCALITY: Rock Creek Park, Washington, D. C. COLLECTED: June 14, 1959 by John F. Kaifer. HOST: *Juglans nigra* L. (Juglandaceae), eastern black walnut. RELATION TO HOST: the mites are vagrants on the undersides of the leaves, causing some rusting. TYPE MATERIAL: a type slide and two paratype slides bear the above data. There is also a collection of dry leaves from which the mites were taken. A series of seven paratypes are of mites collected at College Park, Maryland, July 16, 1959, by the writer. In this latter location some damage was noted on the leaves. The mites are always more concentrated on the younger leaves.

ACULUS GRANDIDENTATUS, new species

Plate 3

The striking character of this mite is the "tooth-like" projection from each side of the shield. This is a species that lacks the pair of small spines on the anterior shield lobe.

Female 170 μ -185 μ long, 65 μ wide, 40 μ thick; flattened-spindleform; color light yellowish-white. Rostrum 30 μ long, curved down. Shield 43 μ long, 65 μ wide, broadly triangular. Anterior shield lobe of moderate size, acute, lacking small spines. Shield design obscure; design lines somewhat granular; median line present in center of shield; admedian lines apparently complete from anterior lobe, curving in and out, spreading apart and forming an almost semicircular area at rear margin; submedian weak, ending ahead of dorsal tubercles. Lateral lobes of shield produced into prominent blunt projections extending considerably beyond body margin. Dorsal tubercles 34 μ apart, on rear margin; dorsal setae 6 μ long, projecting backward and diverging. Forelegs 36 μ long; tibia 10 μ long, seta 4 μ long and arising at basal 1/4; tarsus 6.5 μ long; claw 6.5 μ long, tapering, with small knob; featherclaw 6-rayed. Hindlegs 33 μ long, tibia 9.5 μ long, tarsus 6.5 μ long, claw 7.5 μ long. Anterior coxae broadly contiguous, the coxae lined and granular; first setiferous tubercles set well ahead of second tubercles; the second setiferous coxal tubercles hardly ahead of transverse line through third tubercles. Abdomen completely microtuberculate, the microtubercles touching rear ring margin, considerably elongate dorsally; 30-35 tergites, 50-55 sternites. Lateral seta 23 μ long, on about sternite 6; first ventral seta 40 μ long, on about sternite 19; second ventral seta 31 μ long, on about sternite 35; third ventral seta 27 μ long, on

Plate 3 - *Aculus grandidentatus*, new species

sternite 5 from rear. Accessory seta 6 μ long. Female genitalia 22 μ wide, 14 μ long; cover-flap with 11-12 longitudinal furrows; seta 17 μ long.

TYPE LOCALITY: Greenbelt, Maryland. **COLLECTED:** August 1, 1959 by John F. Kelfer and the writer. **HOST:** *Populus grandidentata* Michx. (Salicaceae), bigtooth aspen. **RELATION TO HOST:** the mites are vagrants on the underside of the leaves. **TYPE MATERIAL:** there is a type slide and a paratype slide with the above data, and a collection of dry leaves bearing dead mites. A tree of eastern cottonwood, *Populus deltoides* Bartr., growing nearby also had an infestation of these same mites.

ACULUS PELEKASSI K.

This citrus rust mite was originally collected at Preveza, Greece, September 12, 1958, by Dr. C. D. Pelekassis, where it was damaging orange and mandarin orange. The original reference is: Occ. Papers, Cal. Bur. Ent. No. 1: 7, May 8, 1959. Dr. C. A. Fleschner collected numerous specimens of this mite on mandarin orange, *Citrus reticulata*, at Petchaboon, Thailand, June 29, 1959. Fleschner states that the damage to the mandarin trees was the most severe case of citrus rusting he had ever seen and was probably due to a poorly applied DDT spray. This Asiatic location is undoubtedly in the general vicinity of the original habitat of this mite, and the fact that it has spread to Greece indicates its potentialities. The Thailand specimens show a stronger diagonal line from the center of the admedian shield lines than I detected in the specimens from Greece.

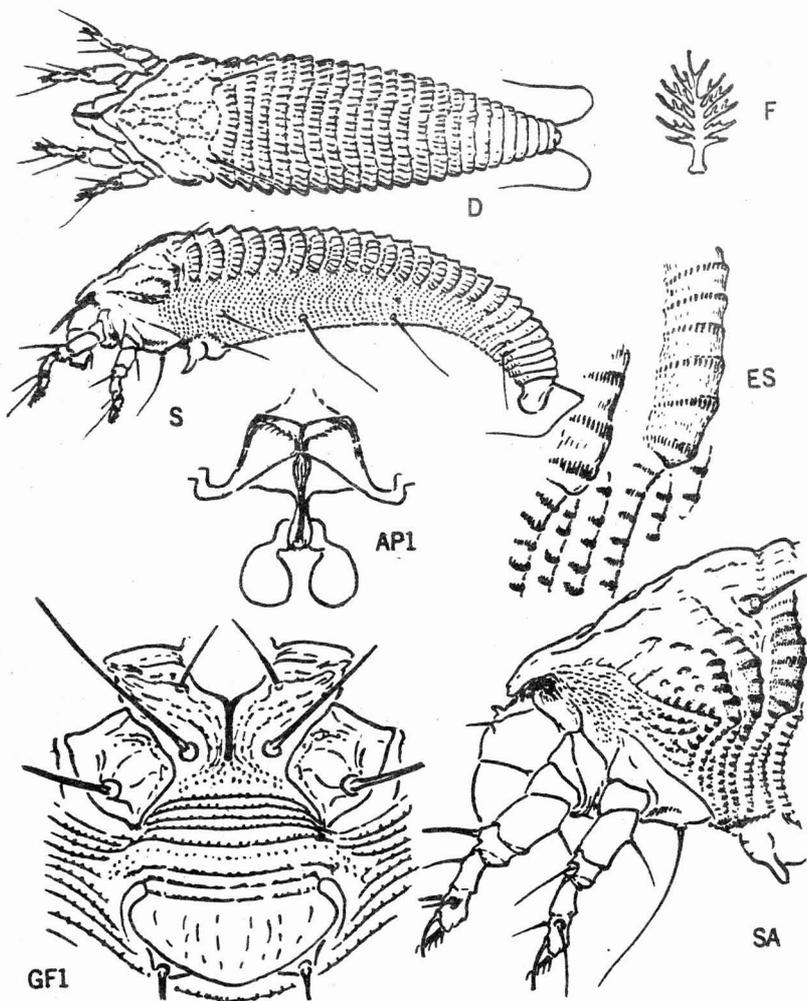


Plate 4 - *Tetra liriiodendronis*, new species

TETRA LIRIODENDRONIS, new species

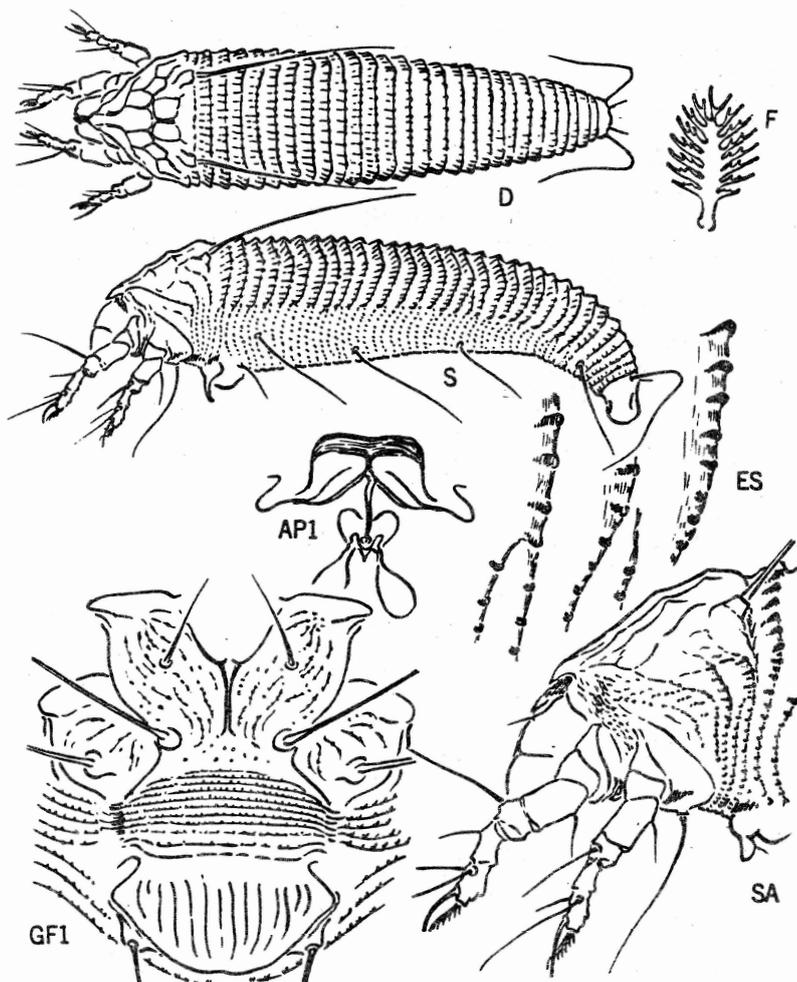
Plate 4

The shallow longitudinal dorsal concavity on this mite, plus the backward directed dorsal setae, conform to the definition of *Tetra*, but this species, and the next one (on black locust), are not closely related to the genotype of the genus: *conca* K. This new species, on tuliptree, is characterized by the elongate dorsal microtubercles, the short tergites curving ahead below the dorsal tubercles, and the 6-rayed featherclaw.

Female 150 μ -160 μ long, 40 μ wide, 35 μ thick; spindleform, very light yellowish in color. Rostrum 23 μ long, curved down; Shield 36 μ long, 40 μ wide; anterior lobe acute, somewhat curved down over rostrum. Shield design of lines of granules, unclear; median line indicated centrally; admediani nearly complete, curving, diverging to rear; a submedian line indicated on each side; lateral lobes with strong microtubercles, two short tergites curving anteriorly under the dorsal tubercles. Dorsal tubercles 27 μ apart, on rear margin; dorsal setae 12 μ long, diverging to rear. Forelegs 26 μ long; tibia 6.5 μ long, seta 3.3 μ long, arising slightly above middle; tarsus 5.5 μ long; claw 5.5 μ long, slender; featherclaw 6-rayed. Hindlegs 23 μ long, tibia 5.5 μ long, tarsus 5.5 μ long, claw 5.5 μ long. Coxae with lines and granules; anterior coxae broadly contiguous centrally; first coxal tubercles well ahead of second tubercles and slightly further apart; second tubercles somewhat ahead of transverse line through third tubercles. Abdomen with about 20 tergites and 55-60 sternites; tergites somewhat flaring at sides, the dorsal microtubercles conspicuously elongate; sternal microtubercles slightly elongate and touching rear edges. Lateral seta 23 μ long, on about ster-

nite 6; first ventral seta 26μ long, on about sternite 20; second ventral 26μ long, on about sternite 34; third ventral 17μ long, on sternite 4' from rear. Accessory seta 3μ long. Female genitalia 21μ wide, 14μ long; coverflap with no conspicuous furrows; genital seta 15μ long.

TYPE LOCALITY: Greenbelt, Maryland. COLLECTED: August 1, 1959, by John P. Keifer and the writer. HOST: *Liriodendron tulipifera* L. (Magnoliaceae) tuliptree. RELATION TO HOST: the mites are undersurface leaf vagrants. TYPE MATERIAL: a type slide and six paratypes bear the above data. There is also an envelope of dry leaves with the above data, bearing mites.

Plate 5 - *Tetra robiniae*, new species

TETRA ROBINIAE, new species

Plate 5

The mite on the underside of black locust leaves is similar to the leaf vagrant on tuliptree. Both have shallowly concave dorsa, elongate microtubercles, and short tergites curving forward below the dorsal shield tubercles. But *robiniae* differs in having much longer dorsal setae, a much stronger shield design, more rays in the featherclaw, and strongly furrowed genital coverflap.

Female 145μ - 160μ long, 40μ - 45μ wide, 35μ - 40μ thick, spindleform, dull light yellow in color. Rostrum 20μ long, curving down. Shield 36μ long, 40μ wide, triangular; anterior shield lobe small, acuminate. Shield design strong; median line present as a short line ahead of rear margin, joined front and rear to admedians by cross lines; admedians complete, curving, diverging to rear; submedian lines forming network ahead of dorsal tubercles. Lateral shield lobes with short tergites bearing elongate microtubercles curving ahead below dorsal tubercles. Shield dorsal tubercles 22μ apart, on rear margin; dorsal setae 48μ long, diverging to rear.

Forelegs 28μ long; tibia 6μ long, with seta 5μ long arising just above middle; tarsus 6μ long; claw 6.5μ long, slender; featherclaw 8-rayed. Hindlegs 25μ long, tibia 5.5μ long, tarsus 6μ long, claw 9μ long. Coxae with lines and granules; anterior coxae broadly joined centrally; first coxal tubercles well ahead of second tubercles; second tubercles a little ahead of line through third tubercles. Abdomen with about 25 tergites and about 50-55 sternites; completely microtuberculate, the microtubercles elongate dorsally. Abdominal dorsum with broad shallow longitudinal trough; no tergites elevated above others. Lateral seta 30μ long, on about sternite 8; first ventral seta 45μ long, on about sternite 21; second ventral 30μ long, on about sternite 34; third ventral seta 22μ long, on sternite 5 from rear. Accessory seta 3μ long. Female genitalia 20μ wide, 14μ long; coverflap with about 10 longitudinal furrows; genital seta 20μ long.

TYPE LOCALITY: Greenbelt, Maryland. COLLECTED: August 1, 1959, by John P. Keifer and the writer. HOST: *Robinia pseudoacacia* L. (Leguminosae) black locust. RELATION TO HOST: the mites are under-surface leaf vagrants, possibly causing damage when numerous enough. TYPE MATERIAL: a type slide and three paratype slides bear the above data. There is also the dry leaf collection from which the slides were made.

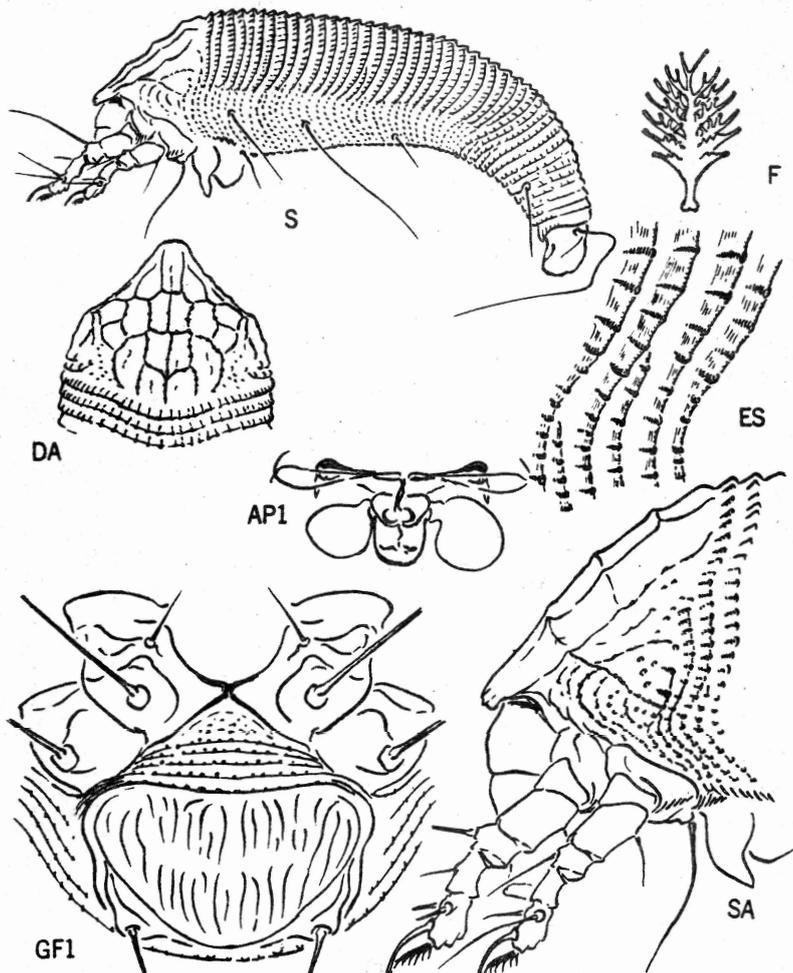


Plate 6 - *Cecidophyes quercialbae* new species

CECIDOPHYES QUERCIALBAE, new species

Plate 6

Previously described members of this genus have 4 and 5-rayed featherclaws. The new species differs in having a 7-rayed featherclaw. The new species is also characterized by the curved shield lines that frame the central rear of the shield, by the narrow point of contact between the forecoxae, and the elongate microtubercles.

Female 140 μ -180 μ long, 50 μ wide, 45 μ thick; spindleform, light yellowish-white. Rostrum 30 μ long, curved down. Shield 40 μ long, 43 μ wide; anterior lobe projecting over rostrum, somewhat blunt, furrowed in side view on anterior declivity. Shield design a strong network of lines set with granulations: median line nearly complete; admedian lines complete, closer on anterior lobe, connected to median line by three cross lines; a submedian line on each side, connected to admedians by two cross lines, the second such cross line forming with the curved rear of the submedians a frame for the central rear of the shield. Additional lateral lines present, one forming a prominent fork at the side; lateral areas on shield granular. Dorsal tubercles and setae missing. Forelegs 30 μ long; tibia 7 μ long, with seta 5 μ long arising about center; tarsus 6.5 μ long; claw 8.5 μ long, slender, tapering; featherclaw 7-rayed. Hindlegs 27 μ long, tibia 6 μ long, tarsus 6.5 μ long, claw 7 μ long. Coxae with curved lines part of which frame the setiferous tubercles; anterior coxae very narrowly touching centrally; first tubercles ahead of second tubercles; second tubercles well ahead of transverse line through third tubercles. Abdomen with 35-40 tergites, about 65 sternites; completely set with somewhat elongate microtubercles that touch ring margins, the dorsal microtubercles longer. Lateral seta 17 μ long, on about sternite 7; first ventral seta 38 μ long, on about sternite 20; second ventral 8 μ long, on about sternite 36; third ventral 27 μ long, on sternite 6 from rear. Accessory seta absent. Female genitalia 25 μ wide, 15 μ long; coverflap with about sixteen longitudinal furrows in two ranks; genital seta 13 μ long.

TYPE LOCALITY: Campus of the University of Maryland, College Park, Maryland. COLLECTED: July 21, 1959 by the writer. HOST: *Quercus alba* L. (Fagaceae), white oak. RELATION TO HOST: the mites are undersurface vagrants, especially along the ribs of the leaves. TYPE MATERIAL: a type slide and three paratype slides bear the above data. In addition there is an envelope of dry leaves bearing mite mummies.

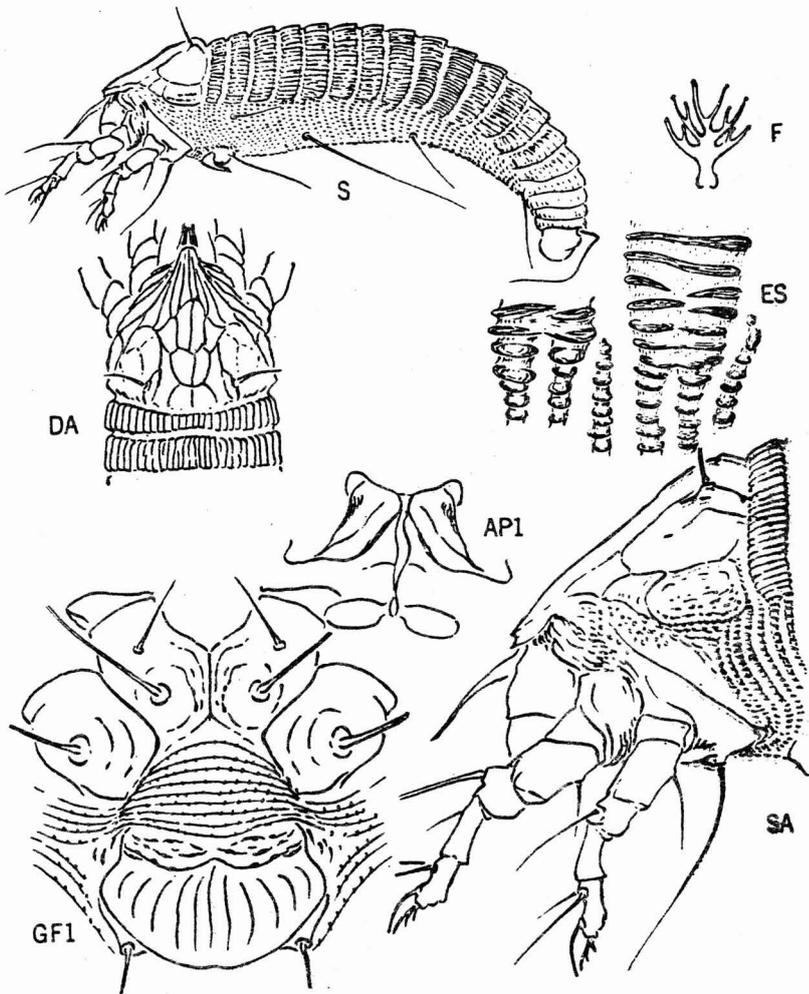


Plate 7 - *Phyllocoptes bouganvilleae*, new species

PHYLLOOPTES BOUGANVILLEAE, new species

Plate 7

The longitudinally striate tergites and the outwardly directed dorsal setae are the principle distinguishing features of this mite. While it has no apparent relatives in the genus to which I am assigning it there are no characters which seem adequate for the erection of a new genus at the present time.

Female 155 μ -175 μ long, 45 μ -50 μ wide, 35 μ -40 μ thick; elongate-spindleform; dull light yellow in color. Rostrum 22 μ long, projecting down. Shield 40 μ long, 43 μ wide, anterior lobe somewhat produced over rostrum and moderately acute. Shield design a network: median line complete but more or less disconnected; admedian lines complete, forming about four cells with cross lines on each side of median line; two submedian lines diverging from origin on anterior lobe, ending at about 1/2 on a diagonal cross line, the outer submedian meeting an inwardly curved line that curves back just inside the dorsal tubercle; more or less elongate cells laterally on shield with some granulations on lateral lobe. Dorsal tubercles 23 μ apart, their axes nearly at right angles to rear shield margin, the rear of the tubercles touching rear margin; dorsal setae 16 μ long, projecting up and diverging. Forelegs 34 μ long; tibia 10 μ long, the seta 4.5 μ long and originating at about 1/3; tarsus 8 μ long; claw 6.5 μ long, slender, curved; featherclaw 3-rayed. Hindlegs 33 μ long, tibia 8.5 μ long, tarsus 8 μ long, claw 6.5 μ long. Coxae with slight granulations and a pattern of a few curved lines; first setiferous coxal tubercles ahead of and further apart than second tubercles; second tubercles well ahead of transverse line through third tubercles. Abdomen with about 19 broad tergites and 63-70 narrow sternites; tergites with microtubercles transformed into elongate striations across dorsum, giving tergites appearance of rough transverse bands; microtubercles on sternites rounded and slightly elongate. Lateral seta 23 μ long, on about sternite 7; first ventral seta 50 μ long, on about sternite 19; second ventral 16 μ long, on sternite 39; third ventral seta 17 μ long, on sternite 5 from rear. Accessory seta absent. Female genitalia 23 μ wide, 13 μ long; coverflap with 11 or 12 longitudinal furrows; seta 25 μ long.

TYPE LOCALITY: Campinas, Brazil. COLLECTED: April 10, 1959 by Dr. A. S. Costa. TYPE HOST: *Bougainvillea spectabilis* Willd. (Nyctaginaceae), bouganvillae. RELATION TO HOST: the mites cause extensive leaf edge-rolling from the underside. TYPE MATERIAL: a type slide, two paratype slides, and an envelope of dry leaves with mites bear the above data.

DICHOPHELMUS, new genus

The genotype of this new genus falls in the general *Aculus* vicinity, with small dorsal tubercles on the rear shield margin, and small backwardly diverging dorsal setae. The shield has a flat rather acute anterior lobe that projects well over the rostrum and hides it in dorsal view, but the distinct feature of the genotype is the divided featherclaw, and the genus is founded upon this structure. The name, *Dichophelmus*, means "two soles" in reference to the divided featherclaw.

Body dorso-ventrally flattened, unequally fusiform in dorsal view. Rostrum of moderate size, projecting down; chelicerae nearly straight; recurved portion of oral stylus shorter than base plus pharyngeal pump. Shield sub-triangular, a rather large acute anterior lobe projecting well over rostrum, concealing rostrum in dorsal view; dorsal tubercles on rear shield margin, the dorsal setae projecting backwards and diverging. Coxae with three pairs of setiferous tubercles. Legs with all usual setae; featherclaw (esopodium) divided. Abdomen strongly divided into tergites and sternites, tergites evenly rounded. Female genital coverflap with longitudinal furrows partly 2-ranked.

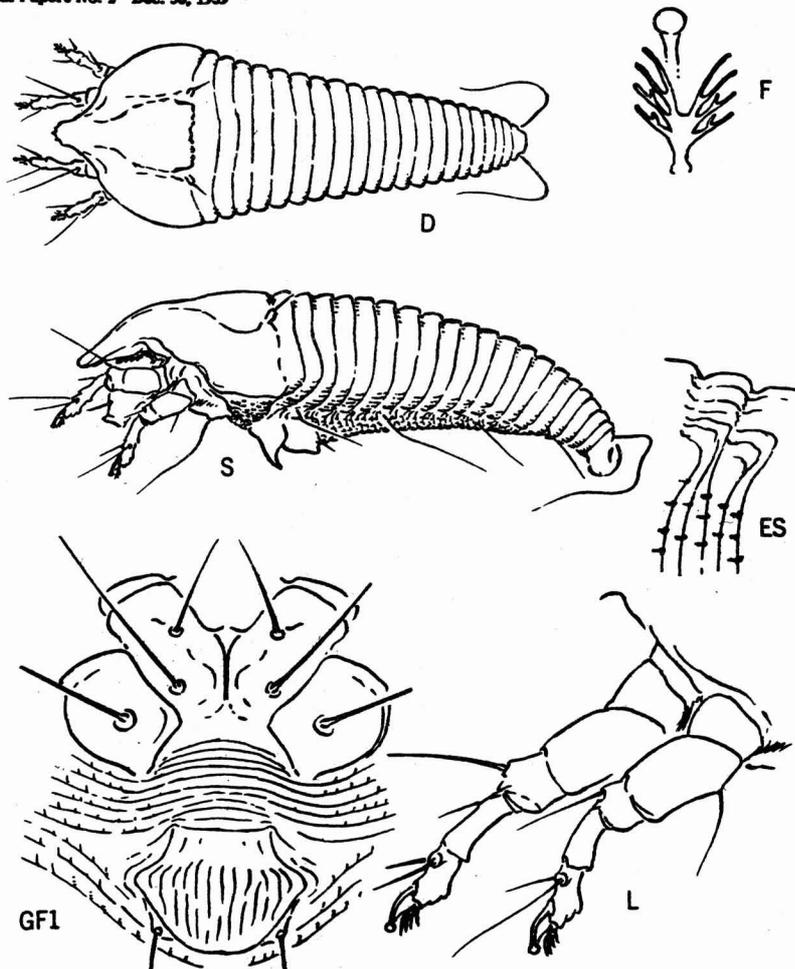
The genotype is as follows:

DICHOPHELMUS NOTUS, new species

Plate 8

Female 185 μ -200 μ long, 75 μ wide, 55 μ thick; unequally fusiform in dorsal view; flattened dorso-ventrally; color probably light yellowish. Rostrum 24 μ long, projecting down. Shield 55 μ long, 75 μ wide, broadly triangular with curving lateral lobes. Anterior shield lobe broad basally, acute apically, several tooth-like projections on apex; the lobe overhanging rostrum and concealing it from above. Shield almost smooth, with longitudinal furrows running ahead from dorsal tubercles; lateral shield lobes broadly rounded. Dorsal tubercles 40 μ apart, small, on rear margin; dorsal setae 10 μ long, diverging to rear. Forelegs 33 μ long; tibia 8 μ long, with 3 μ long seta arising from basal third; tarsus 7 μ long; claw 6 μ long, curved, strongly knobbed; featherclaw divided, 4-rayed on a side. Hindlegs 30 μ long, tibia 6.5 μ long, tarsus 7 μ long, claw 6 μ long. Coxae with almost no sculpturing, the anterior coxae contiguous for a moderate distance; first setiferous coxal tubercles directly ahead of second tubercles; second coxal tubercles well ahead of transverse line through third tubercles. Abdomen with 23-25 rather broad tergites and about 55 sternites; tergites smooth; sternites with small microtubercles, a little elongate, resting on rear ring margin. Lateral seta 14 μ long, arising from about sternite 6; first ventral seta 50 μ long, on about sternite 20; second ventral seta 16 μ long, on about sternite 37; third ventral seta 17 μ long, on about sternite 4 from rear. Accessory seta absent. Female genitalia 25 μ wide, 20 μ long; coverflap with about 12 longitudinal furrows, partly double ranked; genital seta 14 μ long.

TYPE LOCALITY: Misiones, Argentina. COLLECTED: November, 1958, by L. C. Knorr. HOST: given as "Yerba Mate", presumably *Ilex paraguariensis* St.Hil. (Aquifoliaceae). RELATION TO HOST: the mites are presumably rust mites, living on the open leaf surfaces. TYPE MATERIAL: a type slide and four paratype slides bear the above data. Received from Dr. E. W. Baker, U.S.N.M.

Plate 8 - *Dichopalmus setosus*, new species

ACARICALUS ILEXOPACAE, new species

Plate 9

The new species resembles the genotype of *Acaricalus*, which is *segundus* K., by having a rather high central keel on the shield. It differs from that species, however, by having the first part of the abdomen longitudinally striate, by having coarse microtuberculation along the ridges, by having granulations on the sides of the shield, and by having a 2-rayed divided featherclaw.

Female 175 μ -185 μ long, 56 μ wide, 50 μ thick; elongate-spindleform, yellowish in color. Rostrum 26 μ long, projecting down. Shield 50 μ long, 56 μ wide, anterior lobe broad in dorsal view, bluntly rounded, projecting part way over the rostrum, corrugated in lateral view. Shield with high central keel, bounded laterally by the admedian lines, abruptly declivitous at rear; laterally directed line on each side branching from admedians at 1/4; sides of shield coarsely granular. Dorsal tubercles 27 μ apart, main axis longitudinal, set ahead of rear margin; dorsal setae 4 μ long, projecting up and centrad. Forelegs 35 μ long; tibia 9 μ long, with 4 μ long seta centrally placed; tarsus 6.5 μ long; claw 4.5 μ long, bent down, knobbed; featherclaw with 2 rays. Hindlegs 32 μ long, tibia 8.5 μ long, tarsus 6.5 μ long, claw 4.5 μ long. Coxae with some curved lines; anterior coxae narrowly contiguous centrally; first setiferous coxal tubercles set well ahead of second and a little further apart; second setiferous tubercles set well ahead of transverse line through third tubercles. Abdomen with 42 to 45 tergites and 60-65 sternites; first part of dorsum with a pattern of longitudinal striations superceding the tergites; a central longitudinal ridge set with heavy microtuberculation; a supralateral longitudinal ridge on each side, curving centrad somewhat anteriorly, set with coarse microtuberculation; a less strong

sublateral longitudinal ridge extending caudad from lateral shield lobes. Abdominal sternites completely set with rounded microtubercles, the tergites lacking them between ridges. Lateral seta 16μ long, on about sternite 6; first ventral seta 37μ long, arising from about sternite 18; second ventral seta 15μ long, from sternite 38; third ventral seta 20μ long, on sternite 5 from rear. Accessory seta absent. Female genitalia 23μ wide, 16μ long; coverflap with about 12 longitudinal furrows, short dashes and granules basally; genital seta 10μ long.

TYPE LOCALITY: Ash Lawn, Charlottesville district, Virginia. COLLECTED: July 26, 1959 by John F. Keifer and the writer. HOST: *Ilex opaca* Ait. (Aquifoliaceae), American holly. RELATION TO HOST: the mites are vagrants on the undersides of the leaves. TYPE MATERIAL: a type slide and four paratypes bear the above data.

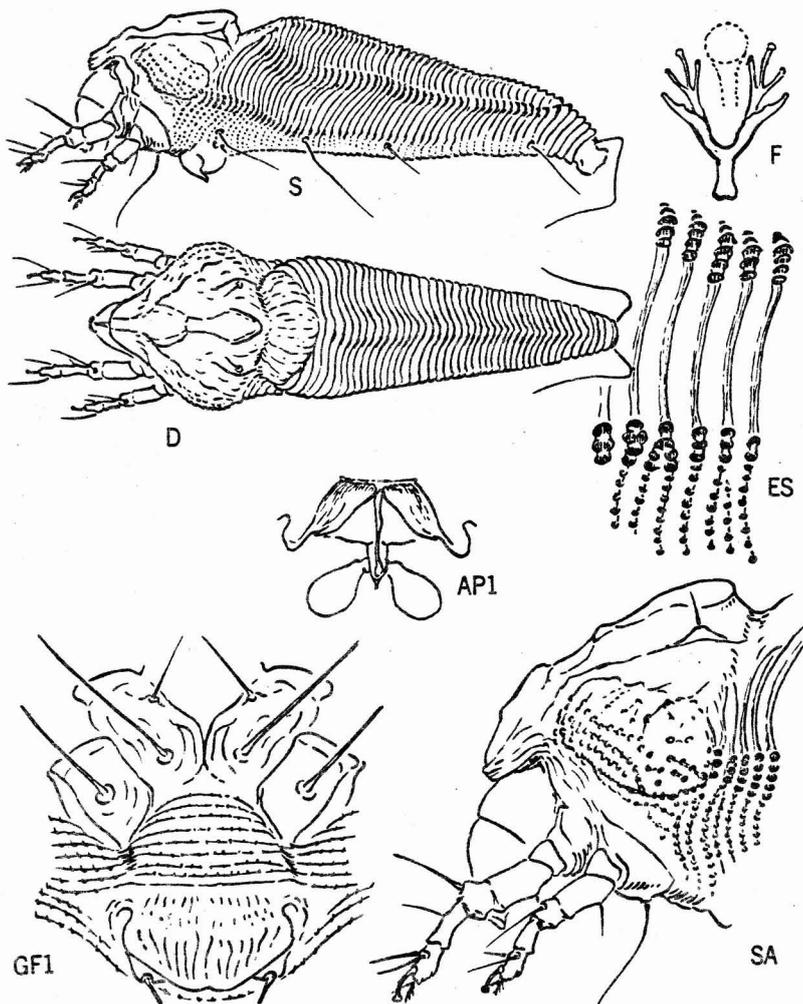
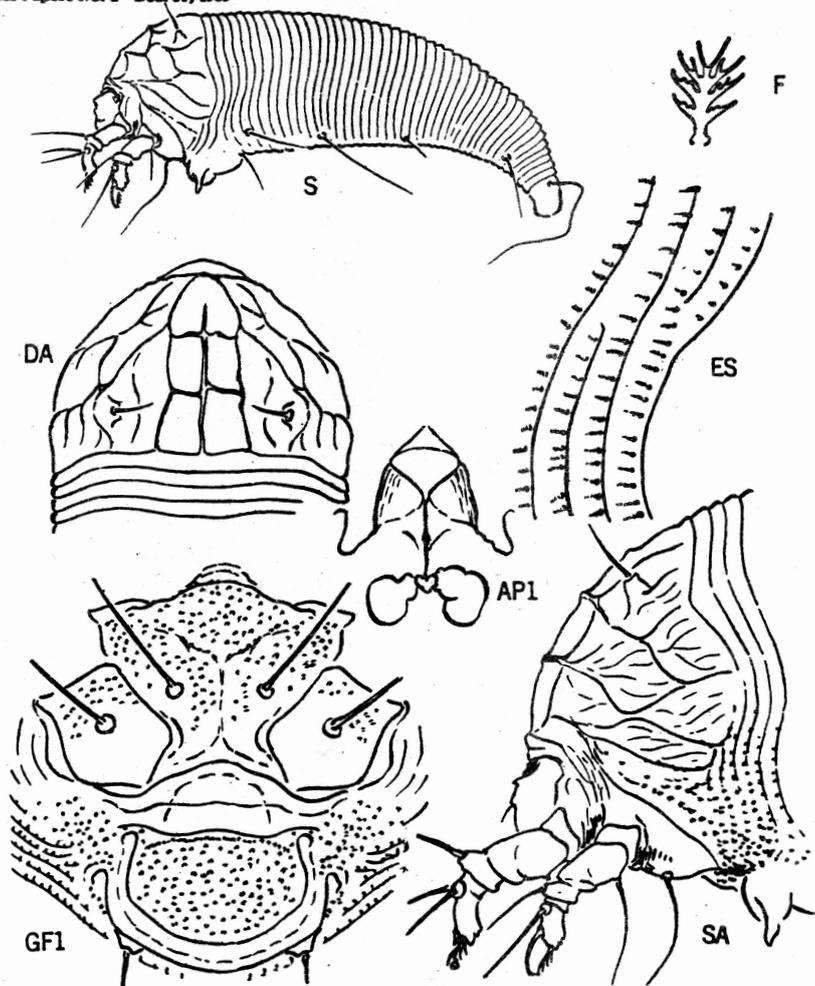


Plate 9 - *Acariculus ilexopacae*, new species

FLORACARUS FLEISCHNERI, new species

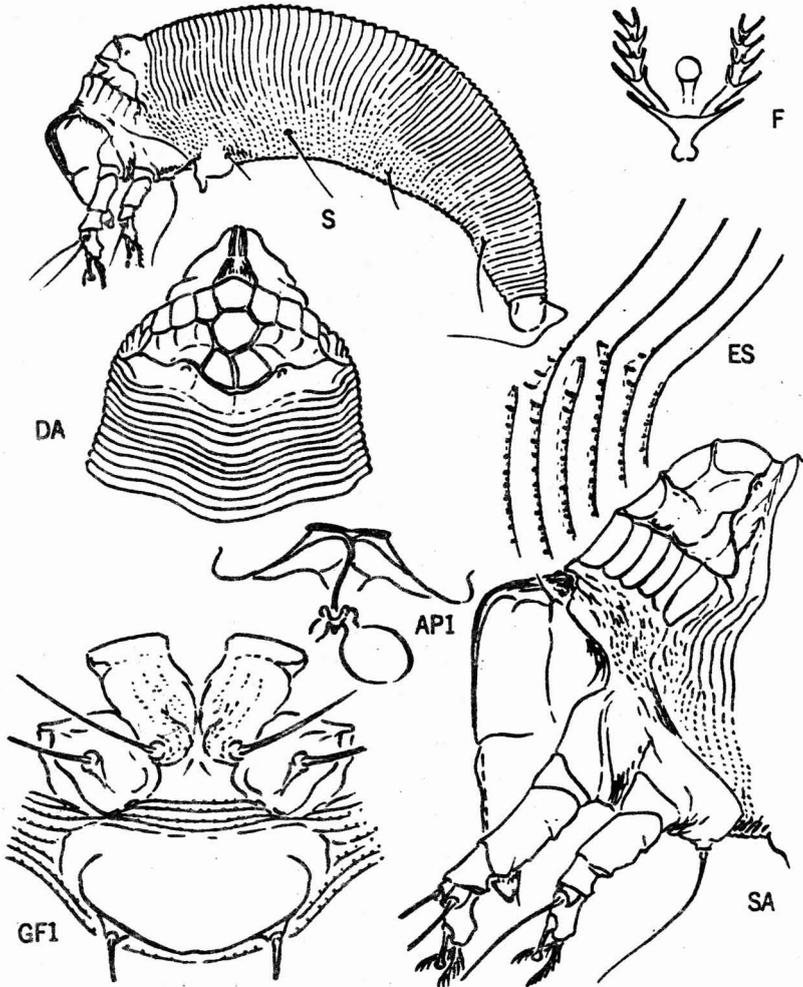
Plate 10

This is the third species to be placed in *Floracarus* although this assignment is not necessarily correct. The genotype of *Floracarus* is *calonyctionis* K. (1953, Bul. Cal. Dept. Agr. 41:69). From the genotype the new species differs in having the dorsal setae projecting up and converging from tubercles well ahead of rear margin; fewer lateral cells in the shield design; no granulations on the femora; a reduced but evident tibia on the hind legs; but one seta on the hind tarsus. The other species, *deleoni* K. (1956, Bul. Cal. Dept. Agr. 44:161) has no lateral shield cells and possesses a 5-rayed featherclaw, as opposed to the 4-rayed structure on the other two species. All three species have elongate microtubercles. This new species extends the Nothopodinae to southern Asia and indicates that the mites of this subfamily are holotropical in distribution.

Plate 10 - *Flarocarus fleischneri*, new species

Female 130 μ -140 μ long, 50 μ thick; spindleform; color probably yellowish-white. Rostrum 22 μ long, projecting down. Shield 32 μ long, 40 μ wide, anterior and lateral margins forming a semi-circle with anterior lobe hardly existent. Shield design a network of lines: median line present on rear 3/4, strong; admedians complete, slightly diverging, connected to median by two cross lines; submedian and lateral lines curving and forming a loose network. Dorsal tubercles 25 μ apart, well ahead of rear margin; dorsal setae 7 μ long, projecting up and converging. Forelegs 25 μ long; tibio-tarsus with slight indication of division, 8.5 μ long, two strong setae; claw 4.5 μ long, nearly straight, knobbed; featherclaw 4-rayed. Hind-legs 19 μ long; tibia reduced but distinct, with tarsus 6.5 μ long, one tarsal seta; claw 6 μ long. Anterior coxae fused together and to subanal plate, all coxae and this plate granular; second tubercles ahead of transverse line through third setiferous coxal tubercles. Abdomen with about 45 tergites and 50 sternites; microtubercles elongate obscure or absent dorsally. Lateral seta 22 μ long, on about sternite 5; first ventral seta 30 μ long, on about sternite 15; second ventral seta 13 μ long, on about sternite 26; third ventral seta 18 μ long, on sternite 7 from rear. Accessory seta absent. Female genitalia 21 μ wide, 13 μ long; coverflap granular; seta 8.5 μ long.

TYPE LOCALITY: Pomora, Assam, India. COLLECTED: February 20, 1959 by C. A. Fleischner. HOST: *Citrus reticulata* Blanco (Rutaceae), mandarin orange. RELATION TO HOST: the mites rust the undersides of the leaves and occasionally attack the fruit. TYPE MATERIAL: a type slide and 11 paratype slides bear the above data. Fleischner also collected this mite on mandarin orange at Gangtok, Sikkim, India, May 30, 1959 where he also observed damage to lemon, navel orange and valencia orange. I take pleasure in naming this mite for the collector.

Plate II - *Diptilomiopus assamica*, new species

DIPTILOMIOPIUS ASSAMICA, new species

Plate II

The genus *Diptilomiopus* is characterized by divided featherclaws, the two sides of which flare out at a considerable angle in relation to each other. No other genus with divided featherclaws has such a wide angle in these structures. The genotype of *Diptilomiopus* is *javanicus* Nal., the only species included with the original description. It occurs on *Hemigraphis confinis* Cogn. in Java. Nalepa states that *javanicus* has a 6-rayed featherclaw. The new species differs from the original species by having a 5-rayed featherclaw, and by having another host: *Citrus*. Another *Diptilomiopus* is on hand from Egyptian fig with a 9-rayed featherclaw. Whether these are actually specific differences, or whether these samplings represent a variable species with a wide host list, remains to be worked out.

Female 215 μ -230 μ long, 60 μ thick, elongate-fusiform, color light yellowish-white. Rostrum 43 μ long, moderately attenuate, apical sensillum approximately terminal; oral stylet recurving near chelicera base, the apical portion longer than the base plus the pharyngeal pump. Shield 31 μ long, 53 μ wide, the design a network of raised lines or carinae. Almost no anterior shield lobe, median shield line present at rear only; admedian lines complete, strongly angled at cross line connections and joined by three transverse lines, the latter two joining the median line; lower front and sides of shield a pattern of vertically elongate cells. Dorsal tubercles, minus setae, present within rear shield margin, 20 μ apart. Legs without femoral or patellar setae, the patella fused with femur. Forelegs 27 μ long; tibia 6 μ long, no seta; tarsus 8.5 μ long, the setae strong; claw 6.5 μ long, straight, projecting diagonally down, knobbed. Hindlegs, 23 μ long, tibia 6 μ long, tarsus 6.5 μ long, with one strong

seta only; claw 6 μ long. Anterior coxae contiguous centrally; first coxal tubercles and setae missing; second coxal tubercles a little ahead of transverse line through third tubercles. Abdomen with about 35-60 tergites and 70-75 sternites; a shallow longitudinal furrow extending on each side of the middorsum, fading caudally; small ventral microtubercles on sternites touching ring margins, absent dorsally. Lateral seta missing; first ventral seta 18 μ long, on about sternite 26; second ventral 15 μ long, on about sternite 45; third ventral 23 μ long, on about sternite 9 from rear. Accessory seta absent. Female genitalia 26 μ wide, 23 μ long; coverflap smooth; seta 10 μ long.

TYPE LOCALITY: Jorhat, Assam, India. COLLECTED: March 1, 1939 by C. A. Fleischer. HOST: *Citrus limonia* Osb., and several varieties of oranges. RELATION TO HOST: the mites are rust mites but in this case were not doing serious damage. TYPE MATERIAL: A type slide and four paratype slides bear the above data. The ubiquitous *Phyllocoptura oleivora* (Ashm.) was mixed in with this species of *Diptilomiopus*. Fleischer also collected a few specimens of this *Diptilomiopus* on grapefruit and Valencia orange at Burnikat, Assam, India, on February 25, 1950.

With the description of this new species of *Diptilomiopus*, five rust mites are now listed on Citrus. These are:

1. *Phyllocoptura oleivora* (Ashm.), the citrus rust mite
Host: various species of citrus, causing rusting and silvering of leaves and fruit
Distribution: nearly world-wide
2. *Calosarus citrifolii* K.
Host: *Citrus* spp., causing concentric ring blotch
Distribution: South Africa
3. *Aculus palmatus* K.
Host: *Citrus reticulata*, mandarin orange, and other Citrus species
Distribution: Greece and Thailand
4. *Flourensarus fleischeri* K.
Host: *Citrus reticulata*
Distribution: India
5. *Diptilomiopus asamicae* K.
Host: *Citrus limonia*, lemon, and other Citrus spp.
Distribution: India

RHYNCOPHYTOPTUS SACCHARINI, new species

Plate 12

Both the new species and *R. atrigatus* K. have longitudinal furrows on the female coverflap and pointed microtubercles, but the new species has a median line in the shield design which is lacking on *strigatus*, and the dorsal tubercles are more produced.

Female 190 μ -210 μ long, 60 μ thick, elongate-spindleform, color light yellowish-white. Rostrum 35 μ long, attenuate, not recurved, apical sensillum arising a little above end of rostrum. Shield 30 μ long, 35 μ wide, no apparent anterior lobe over rostrum. Design a simple series of longitudinal lines; median line complete; submedian complete, curving, joined across rear by a shallow V-shaped line; a submedian line on each side, curving out beyond dorsal tubercles; weak cellular development in lateral design. Dorsal tubercles 22 μ apart, arising near rear shield margin and diverging; dorsal setae 30 μ long, pointing forward and diverging. Legs moderately thick. Forelegs 43 μ long; tibia 7 μ long, with 10 μ long setae arising near center; tarsus 10 μ long; claw 10 μ long, slender, tapering; featherclaw 7-toyed. Hindlegs 40 μ long, tibia 6.5 μ long, tarsus 10 μ long, claw 10 μ long. Coxae set with curved lines; anterior coxae contiguous centrally; first setiferous tubercles further apart than second tubercles; second setiferous tubercles well ahead of transverse line through third coxal tubercles. Abdomen with 60-65 tergites and 80-85 sternites; microtubercles set on ring margins, rounded ventrally, produced and pointed dorsally and more sparse dorsally. Lateral seta 10 μ long on about sternite 9; first ventral seta 40 μ long, on about sternite 24; second ventral 25 μ long, on about sternite 41; third ventral 36 μ long, on sternite 8 from rear. Accessory seta absent. Female genitalia 26 μ wide, 14 μ long; coverflap with 10-12 longitudinal furrows; genital seta 16 μ long.

TYPE LOCALITY: Campus of the University of Maryland, College Park, Maryland. COLLECTED: July 22, 1939. HOST: *Acer saccharinum* L. (Aceraceae), silver maple. RELATION TO HOST: the mites are vagrants on the undersides of the leaves. TYPE MATERIAL: a type slide and five paratypes bear the above data.

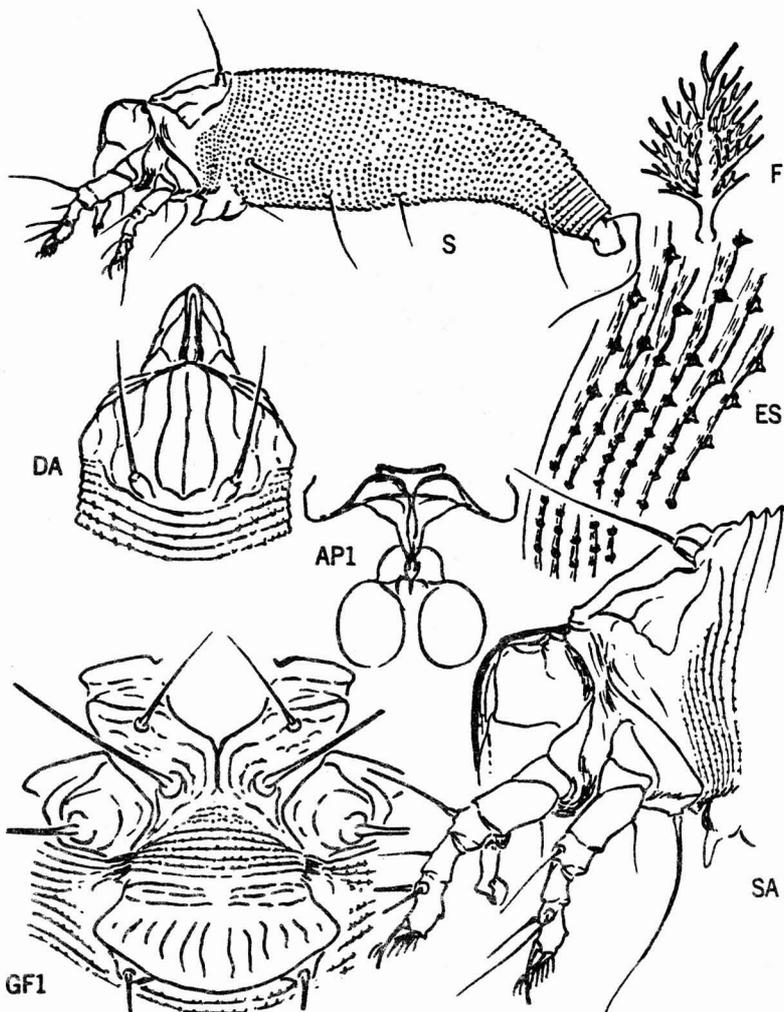
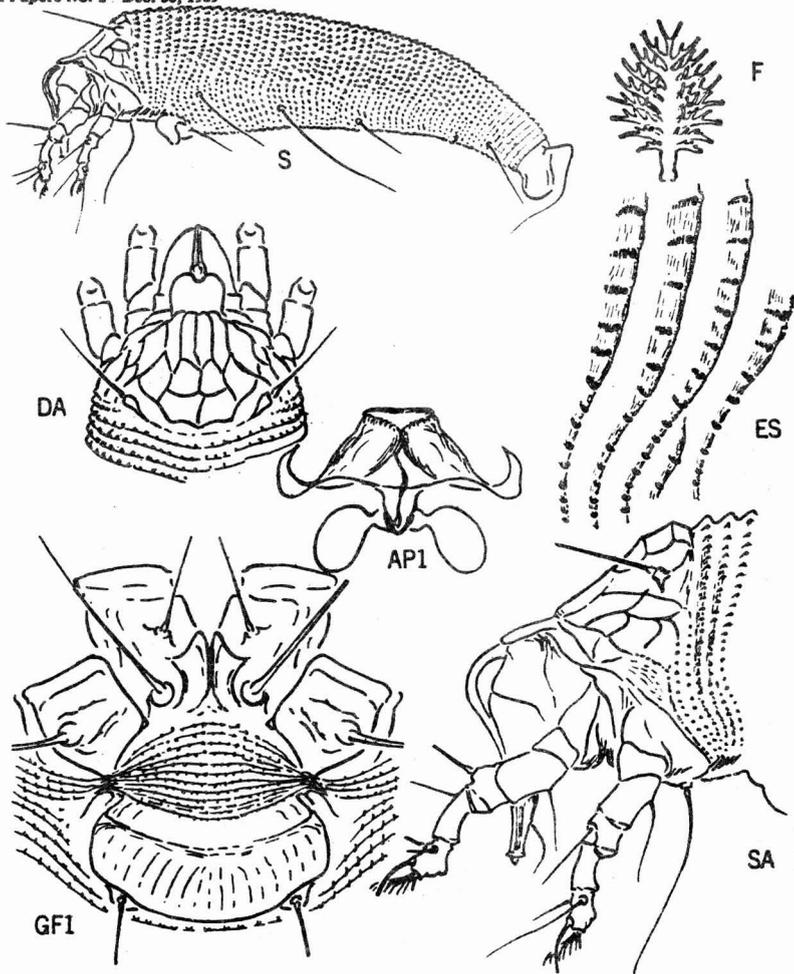
Plate 12 - *Rhyncophytophus seccharini*, new species**RHYNCOPHYTOPTUS ALBUS**, new species

Plate 13

The terminal sensillum on the rostrum of this species is set up above the tip 6.5 microns and provides the most distinctive character of this species. The 9-rayed featherclaw and the microtubercles that hardly touch the rear ring margins on the sides of the tergites are additional features. Another 9-rayed featherclaw species, *scillius* K., has much broader tergites and pointed lateral microtubercles.

Female 200 μ -220 μ long, about 55 μ thick; elongate spindleform; color yellowish-white. Rostrum 40 μ long, attenuate and somewhat recurved forward; rear terminal sensillum long, arising 6.5 μ above apex, projecting down and recurved forward. Shield 40 μ long, 45 μ wide, anterior lobe over rostrum flat, emarginate centrally. Shield design a network of lines: median line complete behind anterior lobe, irregular; admedian lines complete, diverging to rear, joined to median by three cross lines, the first in shield center, the last a line across at rear margin; submedian lines diverging outward in front of dorsal tubercles, joined to admedians in shield center and in front of dorsal tubercles by diagonal cross lines; sides of shield with a network of strong cells. Dorsal tubercles 30 μ apart, on rear shield margin, diverging; dorsal setae 15 μ long, diverging anteriorly. Forelegs 35 μ long; tibia 10 μ long, with seta 8.5 μ long, arising near base; tarsus 6.5 μ long; claw 8 μ long, curved down, slender;

Plate 13 - *Rhyncophytoptus albus*, new species

featherclaw 9-rayed. Hindlegs 33μ long, tibia 8μ long, tarsus 6.5μ long, claw 8.5μ long. Coxae somewhat lined; anterior coxae with a short ridge at junction; first setiferous coxal tubercles ahead of second tubercles; second tubercles well ahead of transverse line through third tubercles. Abdomen with 55-60 tergites and 80-85 sternites; completely microtuberculate, the dorsal microtubercles somewhat elongate and not reaching ring margin, at least laterally; ventral microtubercles on ring margin, rounded. Lateral seta 24μ long, on about sternite 15; first ventral abdominal seta 35μ long, on about sternite 31; second ventral 29μ long, on about sternite 48; third ventral 20μ long, on sternite 6 from rear. Accessory seta 4μ long. Feamle genitalia 26μ wide, 21μ long; coverflap with faint longitudinal furrows; genital seta 30μ long.

TYPE LOCALITY: Campus of the University of Maryland, College Park, Maryland. COLLECTED: July 21, 1959, by the writer. HOST: *Quercus alba* L. (Fagaceae), white oak. RELATION TO HOST: the mites are undersurface leaf vagrants. TYPE MATERIAL: a type slide and five paratype slides bear the above data. In addition there is an envelope of leaves with this data, bearing dry mummies of the mites.

RHYNCOPHYTOPTUS ATLANTICUS, new species

Plate 14

A comparison of this species with *ulmivagrans* K. produces the following data: the tergites are less broad being more like the sternites; the rostrum is thicker and more blunt apically; the featherclaw is 8-rayed as compared to a 5-rayed structure; there is a median line present in the shield design; the microtubercles are more rounded.

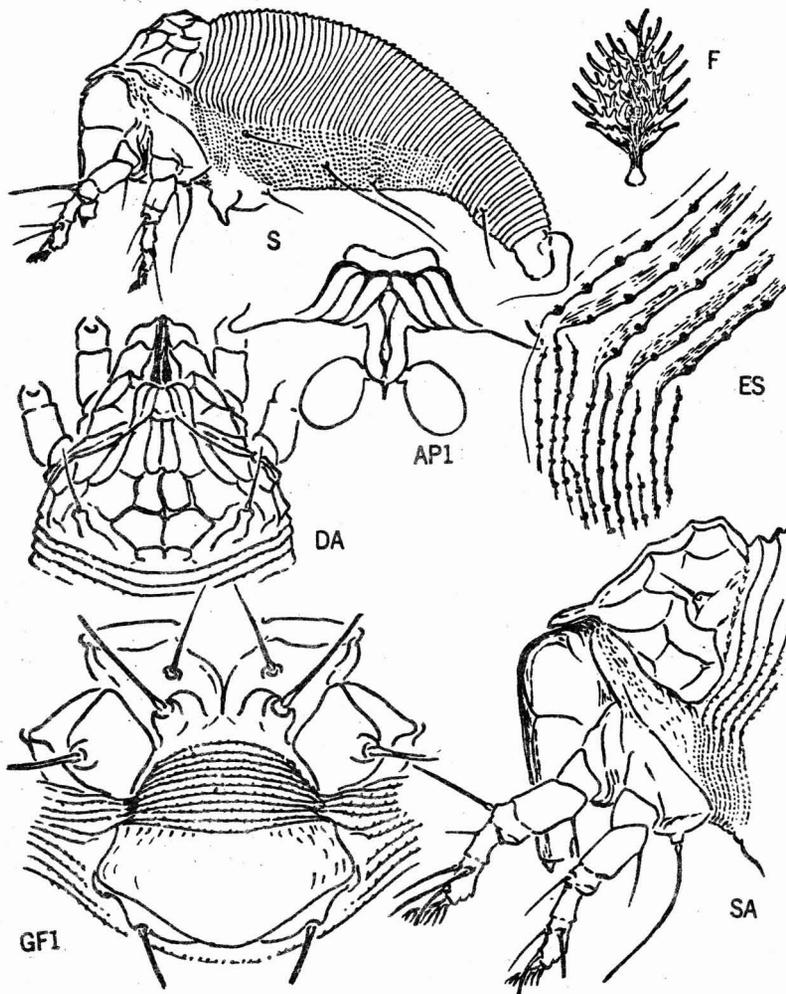
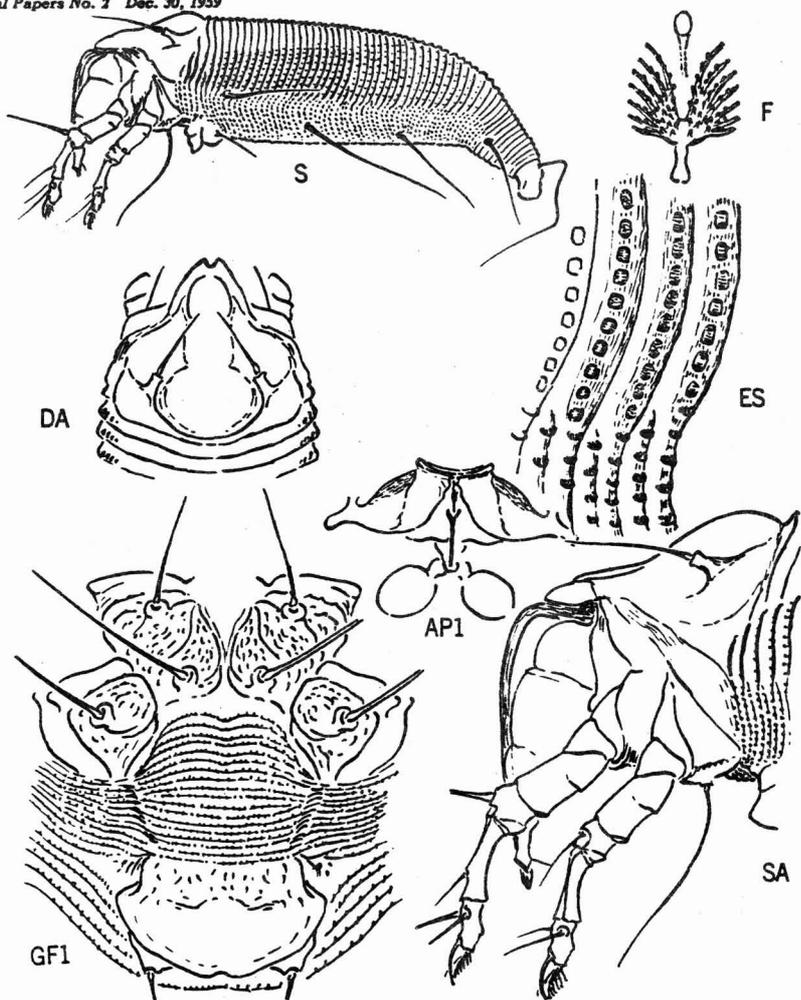


Plate 14 - *Rhyncophytopus artemisicus*, new species

Female 170 μ -200 μ long, 60 μ -70 μ thick; body robust-spindleform; color brownish. Rostrum 56 μ long, thick, apex relatively broad; terminal sensillum arising at tip. Shield 43 μ long, 60 μ wide; anterior lobe short, apically emarginate. Shield design a network; median line complete after anterior lobe; admedian lines complete, an angular outward diversion toward rear, joined to median line by four cross lines; submedian lines broadly diverging past dorsal tubercles, joined to admedians by two lines; some cells in design on lateral shield lobes. Dorsal tubercles 40 μ apart, short, arising just inside rear margin and diverging; dorsal setae 9 μ long, projecting forward and diverging. Forelegs 4 μ long; tibia 8 μ long, seta 8 μ long, arising about center; tarsus 8.5 μ long; claw 7 μ long, slender tapering; featherclaw 8-rayed. Hindlegs 39 μ long, tibia 7 μ long, tarsus 8.5 μ long, claw 9.5 μ long. Anterior coxae contiguous for short distance centrally; first setiferous coxal tubercles ahead of second tubercles; second tubercles ahead of transverse line through third tubercles. Abdomen with 45-50 narrow tergites and 75-80 sternites; ventral microtubercles round and on rear ring margins; microtubercles fading dorsally, a little elongate. Lateral seta 17 μ long, on about sternite 17. First ventral seta 70 μ long, on about sternite 35; second ventral 30 μ long, on about sternite 49; third ventral 36 μ long, on sternite 6 from rear. Accessory seta 3.5 μ long. Female genitalia 25 μ wide, 15 μ long; coverflap smooth; seta 25 μ long.

TYPE LOCALITY: Washington, D. C. COLLECTED: July 27, 1959 by the writer. HOST: *Ulmus americana* L. (Ulmaceae), American elm. RELATION TO HOST: the mites are undersurface leaf vagrants. TYPE MATERIAL: a type slide and three paratype slides bear the above data, as well as an envelope of dry leaves bearing mite mummies from which the type slides were made.

Plate 15 - *Diptacus flocculentus*, new species

DIPTACUS FLOCCULENTUS, new species

Plate 15

In life this species produces a mass of flocculent white wax over itself and can almost be seen as a white speck on the underside of the leaf with the naked eye. This production of wax is matched by two congeneric species: *sacramentae* K. and *calicorylli* K. The new species differs from them mainly by the shape of the featherclaw which has a narrower central cleft. The lateral microtubercles, which are subquadrate and set well within the margin of the tergites, and which are apparently specialized for wax production, are also distinctive.

Female 225 μ -240 μ long, 55 μ -60 μ thick; elongate-spindleform; body color yellowish-white; in life covered with a mass of white flocculent wax. Rostrum 53 μ long, attenuate; terminal sensillum terminal. Shield 50 μ long, 47 μ wide; anterior lobe emarginate apically and with subelliptical area centrally. General design obsolete; admedian lines faintly indicated, outlining central area of shield and expanding into subcircular figure between dorsal tubercles. Dorsal tubercles 32 μ apart, arising well ahead of rear margin and connected to curved transverse line which centrally runs along rear shield margin; dorsal setae 17 μ long, projecting ahead and converging. Forelegs 54 μ long; tibia 17 μ long, seta 8 μ long, arising at apical fourth; tarsus 7 μ long; claw 10 μ long, strongly curved, tapering; featherclaw 7-rayed, divided, the central rays forming an acute V-shaped division. Hindlegs 50 μ long, tibia 16 μ

long, tarsus 7μ long, claw 8μ long. Anterior coxae contiguous for short distance centrally with no appreciable ridge present; coxae strongly lined. First setiferous coxal tubercles well ahead of second tubercles and somewhat further apart; second coxal tubercles ahead of transverse line through third setiferous coxal tubercles. Abdomen with about 30 tergites and 90 sternites; ventral microtubercles rounded and on ring margin; tergites laterally with subquadrate microtubercles set well within margins, dorsally these microtubercles fade. lateral seta 50μ long, on about sternite 11; first ventral seta 50μ long, arising from about sternite 29; second ventral 40μ long, on about sternite 36; third ventral seta 40μ long, on sternite 11 from rear. Accessory seta absent. Female genitalia 23μ wide, 20μ long; coverflap smooth; genital seta 12μ long.

TYPE LOCALITY: College Park, Maryland. COLLECTED: July 17, 1959, by J. P. Keifer and the writer. HOST: *Cornus florida* L. (Cornaceae), flowering dogwood. RELATION TO HOST: the mites are undersurface leaf vagrants. TYPE MATERIAL: a type slide and six paratype slides bear the above data. There is in addition an envelope with dry leaves and mite mummies bearing this data.

Symbols on Plates

- API - Interior genital structures
- D - Dorsal view of mite
- DA - Dorsal view of shield
- ES - Side epidermal structures
- F - Featherclaw
- FD - Featherclaw of deutogyne
- GF1 - Female genitalia and coxae
- S - Side view of mite
- SA - Side view of anterior section of mite