SOME ACARINA FROM GEORGIA PECANS WITH NOTES ON THEIR BIOLOGY[1] [2]

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ABSTRACT

An intensive search in Georgia pecan orchards for Acarina associated with pecan trees during 1969 revealed 22 species in seven families. Included were five new species, one new life form, and 12 new state records. Notes on some biologies and behavior patterns are presented.

Key Words: Pecans, Acarina, mites, Eriophyidae, Tetranychidae, Tenuipalpidae, Tarsonemidae, Tydeidae, Phytoseiidae, Cheyletidae.

Pecans are a major agricultural crop in Georgia and contribute significantly to the State's agribusiness. The Acarina, particularly the Tetranychidae, spider mites, are major pests of pecans in Georgia. Although the Tetranychidae are recognized as major pests of pecans in Georgia, more species of eriophyid mites were found on pecan leaves. Because of their small size, the Eriophyidae have probably been overlooked by previous workers. Eriophyid mites of the Southeastern United States have been reported previously (Davis 1964a, 1964b, 1965, 1966). The present paper represents the fifth in a series on the eriophyid mites from this area. Biological data in this study on the eriophyids were obtained by the investigational methods described by Davis (1964b). The following descriptions, synonymy and biological data concern the 22 species collected from pecan trees during this investigation.

TETRANYCHIDAE

Eotetranychus hicoriae (McGregor)
Tetranychus hicoriae McGregor 1959, Amer. Midl. Nat. 44(2): 287.

Oligonychus (*O.*) *viridis* (Banks)
Tetranychus viridis Banks, 1894, Trans. Amer. Entomol. Soc. 21: 218.

Panonychus citri (McGregor)
Tetranychus citri McGregor, 1916, Ann. Entomol. Soc. Amer. 9: 28.
Paratetranychus citri McGregor, 1919, Proc. U.S.N.M. 56(2303): 672.
Metatetranychus citri Reck, 1941, Soobsh. Akad. Nauk Gruz. S.S.R. 2(9).
Panonychus citri Ehara, 1956, J. Fac. Sci. Ser. No. VI Zool. 12: 244.

Tetranychus schoenei McGregor

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Tetranychus schoenei McGregor, 1941, Proc. Entomol. Soc. Wash. 43: 223.

Tetranychus (*T.*) *urticae* Koch

Tetranychus telarius 1758- of various authors

TENUIPALPIDAE

Brevipalpus obovatus Donnadieu

Brevipalpus obovatus Donnadieu, 1875, Recherches pour servir à l'historie des Tétranyques, Theres, Faculté des Sciences de Lyon. 134 pp.

Brevipalpus sayedi Baker

Brevipalpus sayedi Baker, 1949, Amer. Midl. Nat. 44(2):367.

ERIOPHYIDAE

Aceria caryae (Keifer)

Eriophyes caryae Keifer, 1939, Eriophyid Studies VII. Bull. Calif. Dept. Agr. 28(7, 8, & 9):484.

Aceria caryae Hall, 1967, Univ. of Kans. Sci. Bull. 47(9):627.

Aceria vaga Keifer

Aceria vaga Keifer, 1962, Calif. Dept. Agr. Eriophyid Studies B-5:15.

Aculus caryfoliae Keifer

Aculus caryfoliae Keifer, 1961, Calif. Dept. Agr. Eriophyid Studies B-2:14.

Aculus bacsetae n. sp. (Fig. 1)

This species is close to *A. euphorbiculus* Keifer and *A. tamalpais* (Keifer) being distinct by its strong nail-like dorsal setae, 5-rayed featherclaw, and each tergite curving down to 2 sternites.

FEMALE: About 165-175 μ long; 60-65 μ wide. Rostrum 22 μ long, projecting diagonally down. Shield 46 μ long, 57 μ wide, with a pair of forward directed spines; anterior lobe overhanging rostrum. A shield design absent. Dorsal tubercles 32 μ apart, on rear margin of shield and reclining over rear margin of shield. Dorsal setae strong, nail-like, (same diameter throughout its length) 31 μ long, projecting backwards and slightly divergent. Forelegs about 44 μ long; claw ending in a large knob; featherclaw 5-rayed. Coxae with some lines; distance between first setiferous tubercles equal to that of second. Second tubercles slightly ahead of transverse line through 3rd tubercles. Body with 34 tergites; sternites microtuberculate, about twice as many as tergites. Lateral setae 21 μ long, on about 7th sternite behind shield; first ventral seta 30 μ long, on 15th sternite; second ventral seta 18 μ long, on 31st sternite; third ventral seta 20 μ long, on 5th sternite from rear. Genitalia 22 μ wide, 18 μ long. Cover-flap with 10 longitudinal ribs; setae 9 μ long.

Type locality: Clarke County, Georgia.

Collected: July 10, 1969.

Host: *Carya pecan* Marsh. Pecan. (Juglandaceae).

Type material: Type and one paratype in the collection of Robert Davis; one paratype in the collection of Carlos H. W. Flechtmann; and one paratype in the collection of H. H. Keifer.

Relation to host: These mites are vagrants on the upper hide of the leaves.

Apodiptacus cordiformis Keifer (Fig. 2)

Apodiptacus cordiformis Keifer, 1960, Calif. Dept. Agr. Eriophid Studies B-1:18.

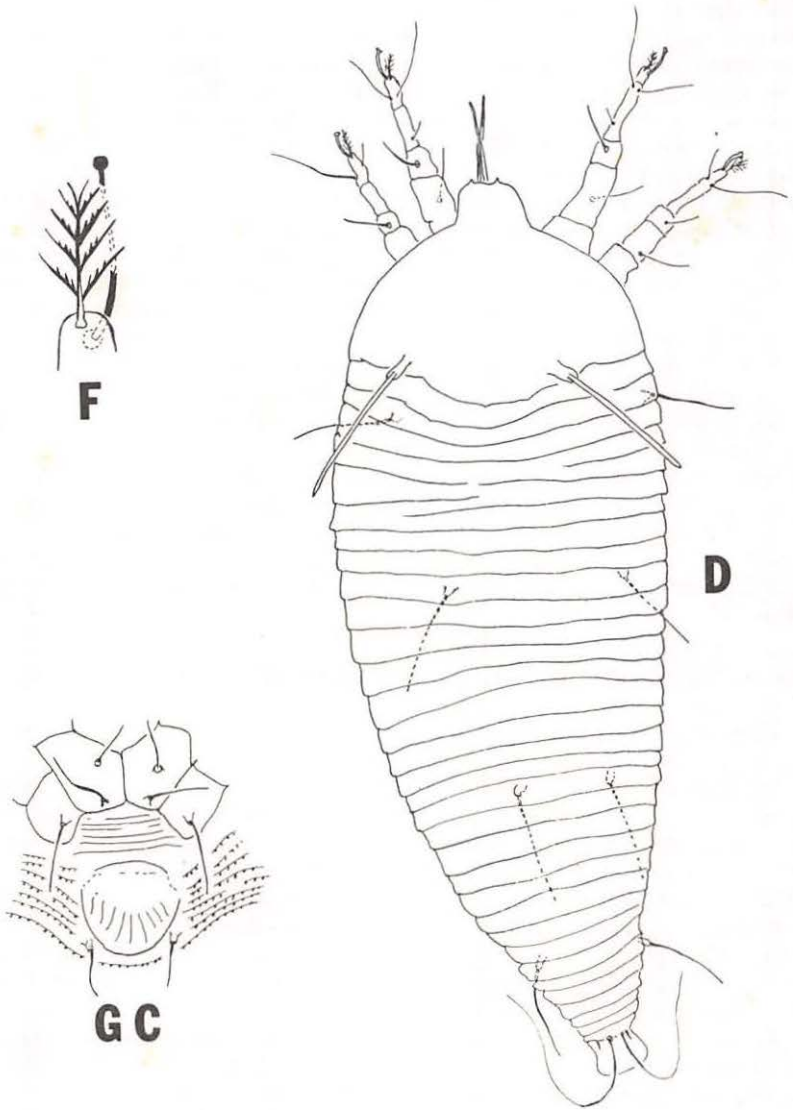

Fig. 1. *Aculus bacsetae* n. sp.; dorsal view; F, featherclaw; GC, genital flap and coxae.

The protogyne was listed by Davis (1964) as occurring on seven different host plants including pecan.

DEUTOGYNE - About 180 μ long, 60 μ wide, 55 μ thick, elongate-fusiform; in life deep port red uniformly covered with white wax. Rostrum 37 μ long and attenuated. Shield 39 μ long, 48 μ wide, subtriangular, the anterior lobe narrowed at base and with slight apical indentation. Median

shield line short, present on anterior half; admedians from each side of anterior indentation, sinuate, recurving behind median line but ahead of rear shield margin; a V-shaped line within rear shield margin; side of shield with some fine lines above coxae. Dorsal tubercles 22 μ apart, projecting forward and slightly centrad from rear margin; dorsal setae 9 μ long, projecting forward. Claw 6.5 μ long, somewhat curved, knobbed; featherclaw divided, 4-rayed on each side. Coxae smooth; first setiferous coxal tubercles set near front end of forecoxae. farther apart than second tubercles; second coxal tubercles set ahead of transverse line through third coxal tubercles. Tergites and sternites with no microtubercles. About 45-50 tergal half-rings, and 65-70 sternal half-rings. Lateral seta 20 μ long, on about sternite 11; first ventral seta 35 μ long, on about sternite 28; second ventral 16 μ long, on about sternite 39; third ventral 33 μ long, on sternite 7 from rear. Accessory seta absent. Female genitalia 24 μ wide, 11 μ long; coverflap smooth; genital seta 10 μ long.

Slides deposited in the collections of the authors and the University of Georgia.

Biology: Laboratory rearings in September at 24 C. provided adult protogynes in 10 days while rearings at 19-20 C. produced deutogynes in 14 days. The species becomes active on the leaves at 19 C., walks about at 22-29 C., and ceases activity at 33 C. Tests on the wind requirements showed that wind speeds of 10.8 km/hr. were necessary to initiate aerial dispersal.

Cecidophyes caryvagrans Keifer

Cecidophyes caryvagrans Keifer, 1964. Calif. Dept. Agr. Eriophid Studies B-11:15.

This report is a new host and state record.

Epitrimerus spinulosus n. sp. (Fig. 3))

We have tentatively assigned this species to the genus Epitrimerus. Spinulosus does not seem to be near any other species that has been referred to this genus. Species of Epitrimerus have the dorsal tubercles set ahead of the rear shield margin, and a more or less prominent subdorsal longitudinal groove. This species does have subdorsal grooves formed by the presence of a distinctive unique dorsal longitudinal ridge. However, all back ridges and grooves have been considered suspect when used to indicate true specie relationships. The species is perhaps most unique by its reduced or small dorsal shield.

FEMALE: 130-135 μ long, 40-45 μ wide, and 45-50 μ thick, elongate-susiform and tapering to the rear. Light yellowish when alive. Rostrum 29 μ long; curved down. Shield small, 25 μ long, 25 μ wide subquadrate with anterior lobe; two edmedian lines, as figured. Dorsal tubercles strong, pointing the setae convergently forward; tubercles 13 μ apart; dorsal setae 21 μ long. Foreleg 31 μ long, featherclaw 6-rayed, anterior coxae with some lines. Body with approximately 35 tergites, bearing spines laterally to the median dorsal ridge. About 68 sternites, all bearing small spines. Lateral setae 11 μ long, on sternite 7; first ventral seta 21 μ long, on sternite 21; second ventral seta 8 μ long, on sternite 33; third ventral seta 16 μ long, on sternite 7 from rear. Genitalia 15 μ wide, 8 μ long; coverflap with 16 longitudinal ribs; setae 7 μ long.

Type locality: Clarke County, Georgia.

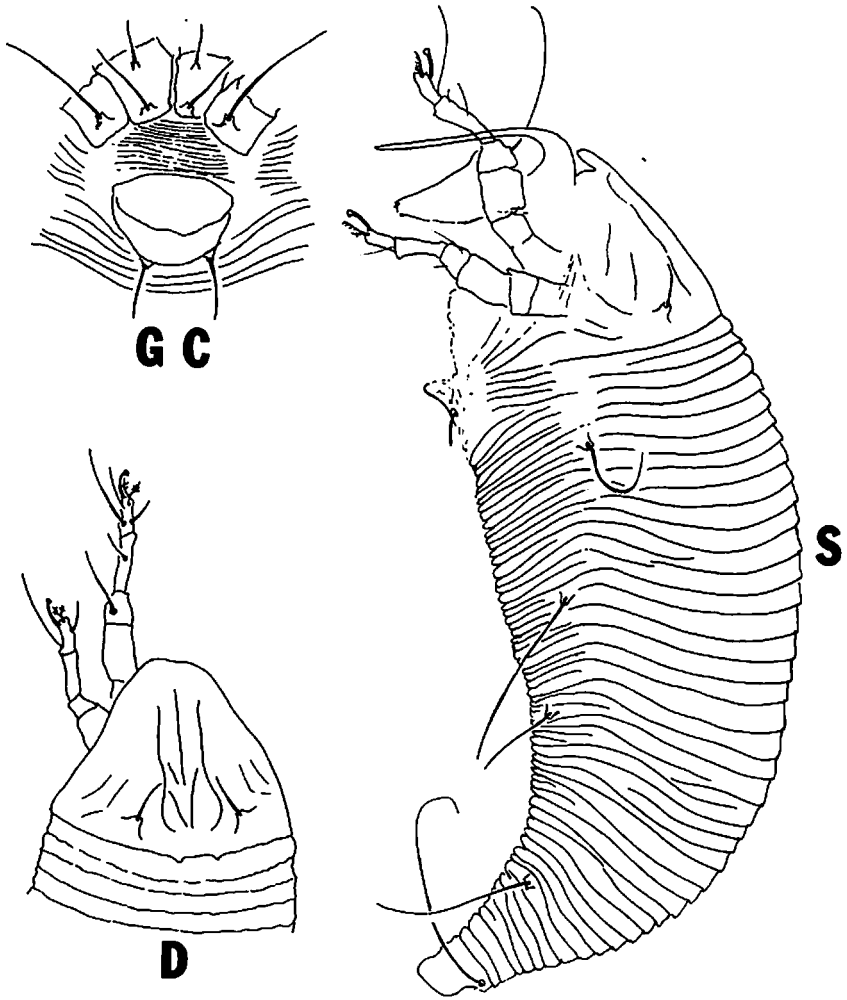

Fig. 2. *Apodiptacus cordiformis* Keifer, (deutogyne); D, dorsal view; S, side view; GC, genital flap and coxae.

Collected: July 1969.
Host: *Carya pecan* Marsh. (Juglandaceae).
Type material: Type and four paratypes in the collection of Robert Davis; three paratypes in the collection of Carlos H. W. Flechtmann; and three paratypes in the collection of H. H. Keifer.
Relation to host: These mites are vagrants on both sides of the leaflets and also on the young nuts.

Oxypleurites ecovagrans n. sp. (Fig. 4)

This species differs from the other members of this genus by having 9 tergites expanded laterally (in the similar species *keifer* Farkas, the lateral

expansions are much larger) and by the absence of a dorsal median ridge.

FEMALE: 140 μ long, 68 μ wide, 48 μ thick, elongate-fusiform; color yellow opaque. Rostrum 18 μ long, projecting down. Shield 49 μ long, 60 μ wide, rounded anteriorly, no pattern. Dorsal tubercles 22 μ apart, well ahead of rear margin; dorsal setae 6 μ long projecting up and anteriorly. Forelegs about 34 μ long, tibia 4 μ long, tibial seta 8 μ long; tarsus 5 μ long; claw 6 μ long, ending in a large knob; featherclaw 5-rayed. Body with 13 tergites, 9 with pronounced lateral expansions; the first medially fused to shield; sternites evenly microtuberculate, about 70. Lateral setae 22 μ long, on about 4th sternite behind shield; first ventral setae 58 μ long, on 17th sternite; second ventral setae 12 μ long, on about 35th sternite, and third ventral setae 10 μ long, on 5th sternite from rear. Coxae with some lines; distance between first setiferous tubercles equal to distance between second, first setiferous tubercles slightly anterior of coxae junction; second tubercles well ahead of transverse line through 3rd tubercles, and slightly anterior of coxal junction. Genitalia 25 μ wide, 12 μ long; cover-flap with 19 longitudinal ribs; setae 11 μ long.

Type locality: Clarke County, Georgia.

Collected: July 1969.

Host: *Carya pecan* Marsh. Pecan (Juglandaceae).

Type material: Type and four paratypes in the collection of Robert Davis; four paratypes in the collection of Carlos H. W. Flechtmann; and four paratypes in the collection of H. H. Keifer.

Relation to host: This mite is a leaf vagrant occurring on both sides of the leaves, and occasionally also found on the young nuts.

Biology: Tests showed that the species becomes active on the leaves at 22 C., and ceases activity at 33 C. Tests on the wind requirements show that wind speeds as low as 5.2 km/hr. would initiate dispersal.

TARSONEMIDAE

Tarsonemus confusus Ewing

Tarsonemus confusus Ewing, 1939, U. S. Dept. Agr. Tech. Bull. 653:26.

Tarsonemus summersi Smiley

Tarsonemus summersi Smiley, 1969, Proc. Entomol. Soc. Wash. 71(2): 218.

TYDEIDAE

Tydeus peh n. sp.

This species is similar to *T. tuttlei* Baker, being distinctive by having two setae on femur III, and being much smaller.

FEMALE: Gnathosoma visible from above; movable digit of chelicera needle-like, short half as long as palpal tarsus. Palpus with 5 : 2 : 2 setae pattern; palpal tarsus with a tiny seta at bases of the proximal setae, resembling a duplex setae; terminal segment long and slender, distal setae somewhat expanded at tip. Propodosomal striae longitudinal, with small, sharp lobes. Sensory setae of propodosoma about 30 μ long, whip-like, smooth. Dorsal body setae about 25 μ long, broadened and serrated; caudal setae, although broadened, tapering to the tip. Ventral body setae slender, nude. Ventral striae longitudinal, somewhat irregular, between first pair of setae and longitudinal between the slender second and third pair of ventral setae: Six pairs of genital setae, three pairs of para-genital setae,

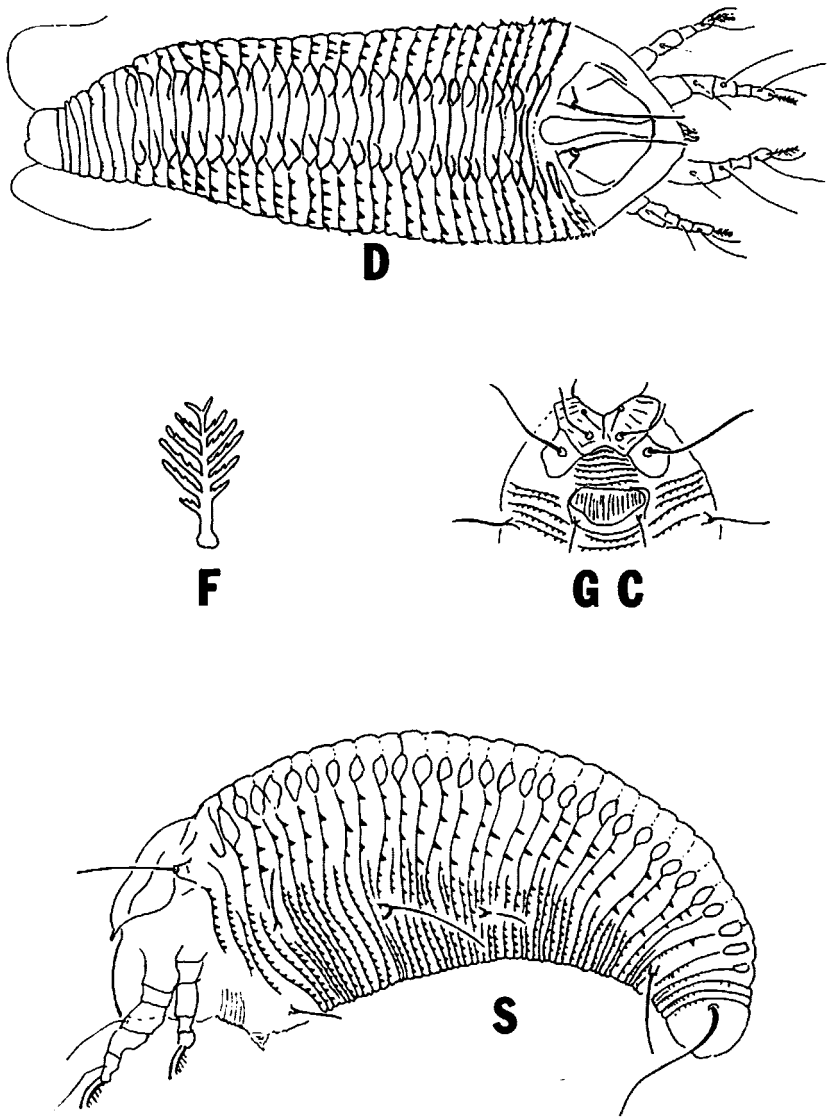

Fig. 3. *"Epitrimerus" spinulosus* n. sp.; D, dorsal view; S, side view; F, featherclaw; GC, genital flap and coxae.

one pair of anal setae. Leg setae pattern: I - 8 : 3 : 3 : 3 : 1 : 2, II - 6 : 2 : 2 : 2 : 3 : 0 : 1, III - 5 : 2 : 1 : 2 : 1 : 3, IV - 5 : 2 : 1 : 1 : 0 : 1. Tarsus I with stout solenidion; tibia I with 3 slender setae and a reduced forked seta. Other setae as figured, the ventral setae of the legs usually slender and the dorsal setae strong.
Empodia with small claw.

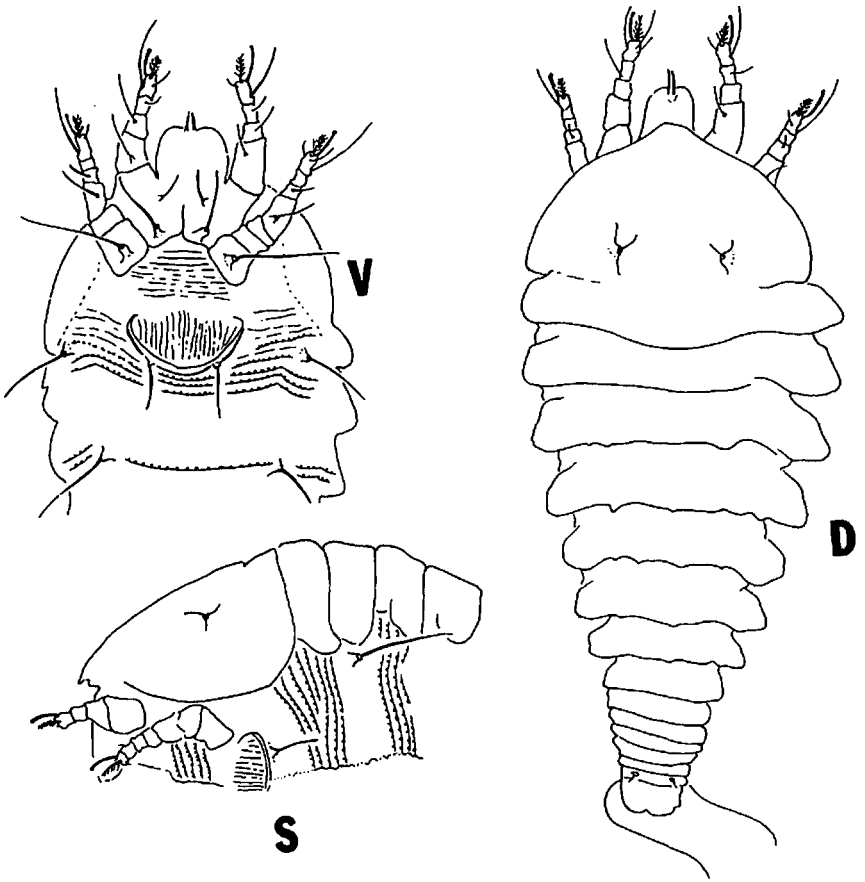

Fig. 4. *Oxypleurites ecovagrans* n. sp.; D, dorsal view; S, side view; V, ventral view with genital flap and coxae.

Body length: 220 μ; width 150 μ.

MALE: Similar to female, same leg setae pattern; 3 pairs of ventral setae, 6 pairs of genital setae, 3 pairs of paragenital setae.

Body length: 190 μ; width 130 μ.

Holotype: Female, ex-*Carya peacan* Marsh (Juglandaceae), Collected in Clarke County, Georgia, on October 4, 1969, by C. H. W. Flechtmann.

Paratypes: One male, and three females same data as holotype, except collected on July 27, 1969, two females as above except collected in August 1969, and two females, as above except collected in October 1961, by P. E. Hunter.

This species is named for Dr. P. E. Hunter, Department of Entomology, University of Georgia, Athens.

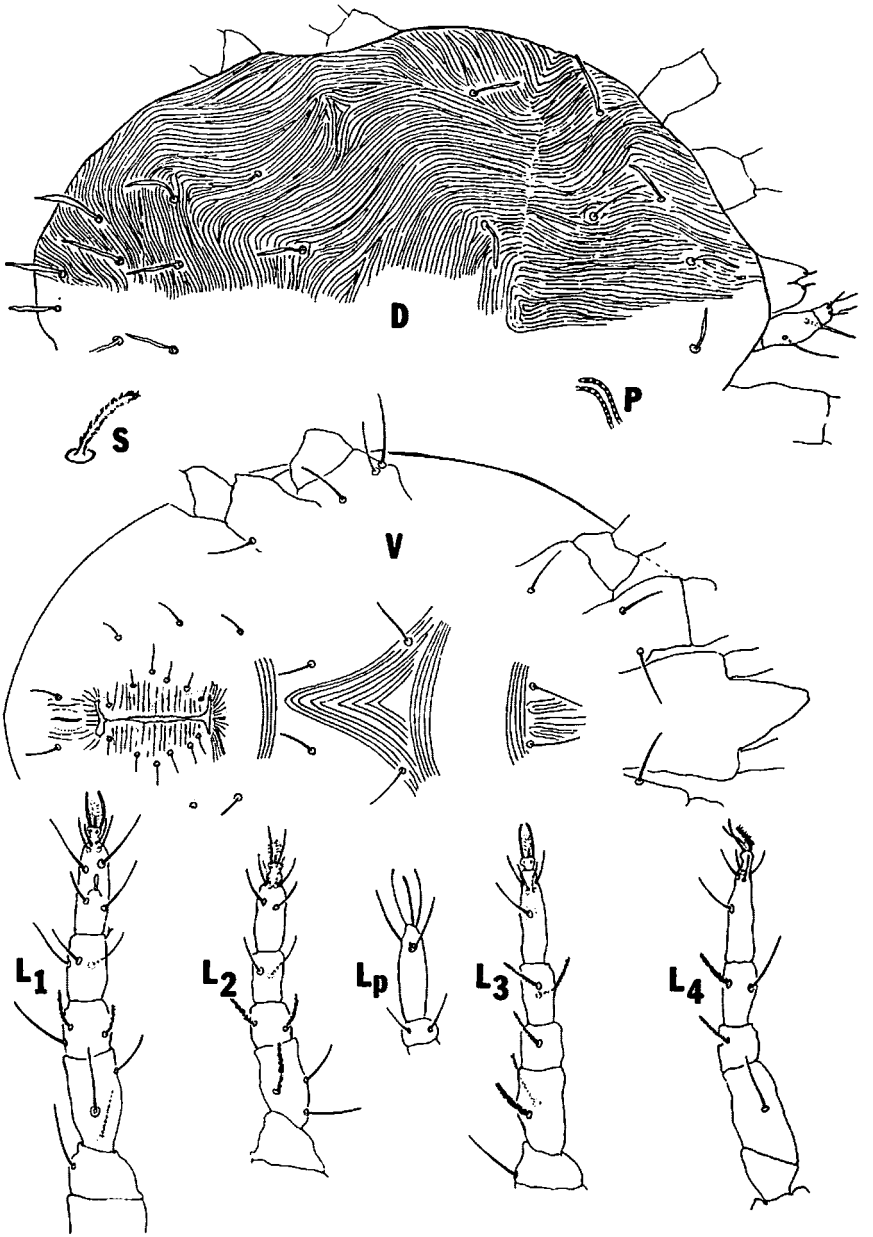

Fig. 5. *Tydeus peh* n. sp.; V, ventral view; D, dorsal view; P, peritreme; S, dorsal seta; L_1, first leg (dorsal); L_2, second leg (dorsal); L^3, third leg (dorsal); L_4, fourth leg (lateral); L_p, tibia and tarsus of palp.

PHYTOSEIIDAE

Galendromus annectens (DeLeon)
Typhlodromus annectens DeLeon, 1958, Florida Entomol. 41(2):75.
Galendromus annectens Muma, 1963, Florida Entomol. 46(Suppl 1):20.

Proprioseiopsis dorsatus (Muma)
Amblysciulus dorsatus Muma, 1961, Bull. Florida St. Mus. 5(7):278.
Proprioseiopsis dorsatus Denmark and Muma, 1968, Florida Entomol. 51(4):231.

Typhlodromina tropica (Chant)
Typhlodromina (T.) *tropicus* Chant, 1959, Canadian Entomol. 91(Suppl. 12):54.
Paraseiulella tropica Muma, 1961, Bull. Florida St. Mus. 5(7):294.
Typhlodromina tropica Muma and Denmark, 1968, Florida Entomol. 51(4):237.

CHEYLETIDAE

Paracheyletia pyriformis (Banks)
Cheyletus pyriformis Banks, 1904. Proc. U.S.N.M. 28: 17.
Cheyletia pyriformis Baker, 1949. Proc. U.S.N.M. 99: 298.
Paracheyletia pyriformis Volgin, 1969. Akad Nauk S.S.S.R. Zool. Inst. Leningrad. Opredel. po Faune S.S.S.R. No. 101: 177.

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