

A NEW SPECIES OF *PAVLOVSKICHEYLA* (ACARINA : CHEYLETIDAE)
FROM THE ELYTRA OF *PLATYDEMA RUFICORNE*
(COLEOPTERA : TENEBRIONIDAE) FROM MISSOURI¹

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ABSTRACT

A new species of cheyletid mite of the genus *Pavlovskicheyla* from Missouri living under the elytra of *Platydema ruficorne* (Sturm) is named. All stages except larvae are illustrated.

ZUSAMMENFASSUNG

Eine neue Art der Gattung *Pavlovskicheyla* von Missouri, die unter den Elytren von *Platydema ruficorne* (Sturm) lebt, und alle Stadien ausser Larve wird beschrieben und illustriert.

***Pavlovskicheyla platydemae* n. sp.**

(Figs. 1-2).

Pavlovskicheyla Volgin, 1965. Akad. Nauk S.S.S.R., Trudy Zool. Inst. **35** : 290-291.

FEMALE (Fig. 1). — Palptarsi each with two combs and two sickles : inner comb with 31 teeth ; outer comb with 12-15 teeth. Sensory solenidion present lateroventrally. Palpal tibial claws edentate. Palpal tibiae each with three setae : dorsal tibial seta implanted on a tubercle, sinuous, barbed, 24 microns ; internal laterals apparently smooth, 15 microns ; external ventro-laterals stout, spinose, ribbed ; 28 microns long. Palpal genua each with two setae : dorsals clavate, ribbed, spinose, 9-11 microns and ventro-laterals similar, more slender, 23 microns long. Palpal femora each with three setae : dorsals broadly clavate, 23-25 microns ; internal ventro-laterals nearly adjacent to ventro-centrals, slender, spinose, ribbed, 24 microns long ; ventro-centrals clavate, spinose, 27 microns long. Prolegmen deeply excavate anteriorly, strongly pebbled.

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2. Research Specialist and Professor, respectively.

Tegmen similarly ornamented, pebbling slightly sparser. Each arm of peritremes composed of five segments. Hypostomal setae 35-38 microns long. Idiosoma with 16 pairs of dorsal setae including humerals.



FIGS. 1-2 : *Pavlovskicheyla platydema* :
1) Dorsal view of female ; 2) Genital field of female.

Propodosoma : four pairs of laterals and two pairs of centrals, these all clavate, ribbed, spinose, 32-38 microns long. Eyes present between second and third laterals at edge of plate. Propodosomal plate pebbled.

Hysterosoma : five pairs of laterals and three pairs of medians, these similar to propodosomals, 30-37 microns long ; hysterosomal plate pebbled. Propodosoma separated from hysterosoma by a transverse band of dotted striae. One pair of setae similar to hysterosomals posterior to hysterosomal shield, 28 microns long. Both shields surrounded by numerous rows of dotted striae, these also present on ventral surface.

Idiosomal venter : one pair of lightly spinose, lanceolate setae between coxae I, 34-36 microns ; a similar pair between coxae III and IV and between coxae IV, 39-42 microns and one pair posterior to these in a transversely striated area, 38 microns long. All medioventrals each on a trivial platelet. The medioventral area from just anterior to coxae I and just posterior to coxae IV striate longitudinally, but apparently not with dotted striae.

Genitalia (Fig. 2) : anterior pair of paragenitals lanceolate, lightly armed, 31 microns ; posterior pair similar, 24-26 microns long ; two pairs of genitals about equal in length, 23-25 microns long. Remainder of genital field as shown.

Legs I : coxae each with two spinose about setae equal in length, 30-32 microns long. Trochanters each with one antero-lateral, clavate, spinose seta, 45 microns long. Femora each with two setae : dorsal seta of segment clavate, armed, 45 microns ; ventral seta oblanceolate, spinose, 45-57 microns long. Genua each with two setae and a sensory solenidion : dorsal seta of segment clavate, spinose, 36-38 microns ; internal lateral member narrow, armed 37 microns long ; sensory solenidion on anterior dorsolateral aspect of segment, 4-6 microns long. Tibiae each with five setae and a sensory solenidion ; ventro-central seta of segment lanceolate, spinose, 78 microns ; anternal and external laterals lanceolate, spinose, about equal in length, 55-60 microns ; internal dorsolateral seta similar to preceding, 45 microns and dorsocentral seta broadly clavate, spinose, 51 microns long ; sensory solenidion anterior to dorsocentral seta, lying beneath it, 17 microns long. Tarsi each with nine setae and one sensory solenidion (Omega I), this on a nipple-like base, 51 microns long ; guard seta spinose, 46 microns long. Inner addorsal seta of segment minutely spinose, 84 microns ; outer addorsal seta similar shorter 78 microns long. All segments of legs I minutely pebbled and some segments with rows of transverse striae.

Legs II : coxae each with one spinose, lanceolate seta, 48 microns long. Trochanters each with one clavate, spinose seta, 45 microns long. Femora each with two setae : ventral member of pair clavate, spinose, 42 microns ; dorsal member similar, 36-38 microns long. Genua each with two setae, both similar, clavate fans, 33-36 microns long. Tibiae each with four setae : two broadly lanceolate, spinose, setae of segment similar in length, 50-53 microns and two narrow lanceolate spinose setae, similar in length, 63-69 microns long. Tarsi each with seven setae and an internal an ventro-lateral sensory solenidion, 20 microns long.

TABLE I. — Chaetotaxy of leg segments I-IV for all stages except larva
of *Pavlovskicheyla platydemae* n. sp.

	Coxae	Trochanters	Femora	Genua	Tibiae	Tarsi
Female	2-I-2-2	I-I-2-I	2-2-2-I	2(I)-2-2-2	5(I)-4-4-4	9(I)-7(I)-7-7
Male	2-I-2-2	I-I-2-I	2-2-2-I	2(I)-2-2-I	5(I)-4(I)-4(I)-4(I)	9(I)-7(I)-7(I)-7(I)
Nymph II	2-I-2-2	I-I-2-I	2-2-2-I	2(I)-2-2-2	5(I)-4-4-4	9(I)-7(I)-7-7
Nymph I	2-I-2-0	0-0-I-0	2-2-I-I	2(I)-2-2-0	4(I)-4-4-4	9(I)-7(I)-7-5

Legs III : coxae each with two setae : one member of pair lanceolate, spinose, 55 microns ; the other narrowly clavate, coarsely spinose, 57 microns long. Trochanters each with two setae : antero-lateral member spinose, narrowly clavate, 38 microns ; ventral member similar, 52 microns long. Femora each with two setae : dorsal member spinose, clavate, 48-52 microns ; ventral member of pair similar, 36 microns long. Genua each with two similar, broadly clavate, spinose setae, 36-39 microns long. Tibiae each with four setae : dorsal pair of segment clavate, spinose, nearly equal in length, 53 microns ; ventro-central member lanceolate, densely spinose, 54 microns and ventro-internal lateral seta narrowly lanceolate, spinose, 83 microns long. Tarsi each with seven setae.

Legs IV : coxae each with two setae : inner member of pair lanceolate, sparsely spinose, 48 microns ; outer seta similar, 33 microns long. Trochanters each with one ventral, narrowly clavate, spinose seta, 60 microns long. Femora each with one clavate, spinose seta, 54-57 microns long. Genua each with two setae : dorsal member or pair broadly clavate, spinose, 42 microns ; ventral seta similar, 48 microns long. Tibia each with four setae : dorsals narrowly clavate or apparently so, spinose, similar in length, 60-63 microns ; ventro-central member lanceolate, densely spinose, 60 microns ; internal ventro-lateral seta narrowly lanceolate, not heavily or densely spinose, 100 microns long. Tarsi each with seven setae. Tarsi of all legs hooked and with two rows of spines on lateral aspect of claws as shown on the SEM micrograph (Fig. 6). Length of female including rostrum 441 microns ; greatest width 272 microns.

MALE (Fig. 3). — Palpal tarsi each with two combs and two sickles : inner comb with at least 21 teeth ; outer comb with 15 teeth. Sensory solenidion present latero-ventrally, narrowly bulbous distally, 9 microns long. Palpal tibial claws edentate, minutely striate longitudinally. Palpal tibiae each with three setae : dorsal tibial seta on a raised base, somewhat sinuous, barbed, 53 microns long ; internal ventral seta smooth, acicular, 44 microns ; external ventral seta stout, saber-like, spinose, 57 microns long. Dorsum and venter of segments with pores. Palpal genua each with two setae : dorsal member of pair clavate, spinose, 42 microns ; lateral member narrow, spinose, 39 microns long. Dorsum and venter of segment with pores and microtubercles. Palpal femora each with three setae : dorsal seta of segment clavate, spinose, 53 microns ; external ventro-lateral seta narrow, densely spinose, 42 microns and internal ventral seta slender, setose, spinose, 38 microns long. Protegmen crater-like anteriorly, transversely sinuous. Protegmen microtuberculate dorsally with the majority of the lines of tubercles oriented on the longitudinal axis of the mite. Tegmen with microtubercular pattern lines oriented transversely. Peritremes composed of five sausage-like segments per side. Hypostomals narrow, spinose, 69 microns long. Idiosoma with fourteen pairs of dorsals including humerals.

Propodosoma : four pairs of clavate, spinose laterals and two pairs of similar centrals. Plate microtuberculate. Humerals clavate, 31 microns long.

Hysterosoma : four pairs of laterals and two pairs of centrals similar to propodosomals. One pair of narrowly clavate setae by genital pore. Two pairs of paragenitals dorsally and three pairs of genitals.

Idiosomal venter : four pairs of lanceolate, spinose setae all about 30 microns long distributed as follows : one pair between coxae I, one pair between coxae III, one pair between coxae IV and one pair halfway between coxae IV and caudum of idiosoma ; one lanceolate, spinose, pair nearly adjacent to caudal end of idiosoma, shorter than preceding four pairs, 19 microns long.

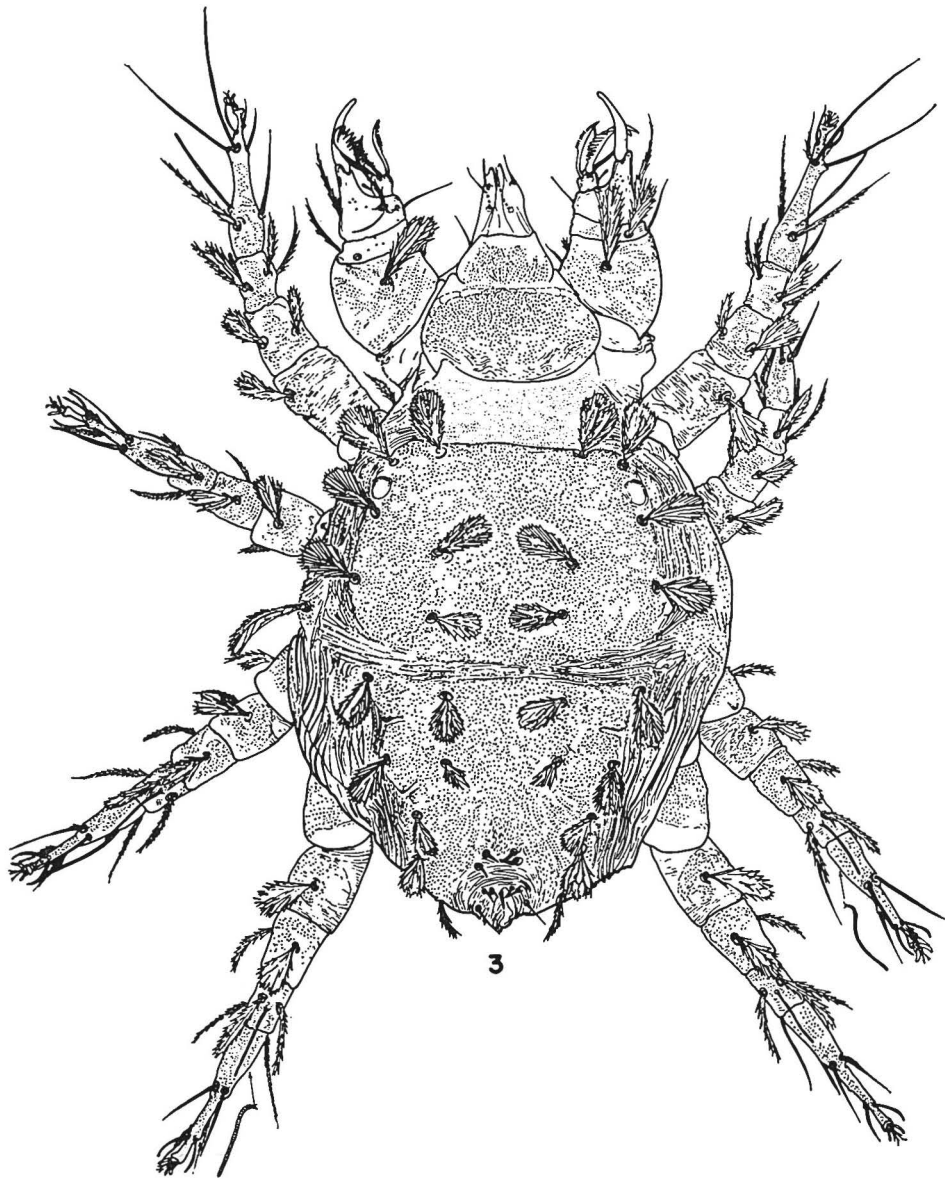


FIG. 3 : *Pavlovskicheyla platydemae* : Dorsal view of male.

Each of these four pairs of setae on trivial platelets, these maculate to some degree. Striations of venter longitudinal beginning just anterior to coxae I and terminating just posterior to coxae IV.

Legs I : coxae each with two setae : anterior seta of segment spinose, narrow, 39 microns long ; posterior member similar, longer, 54 microns. Trochanters each with one clavate, spinose seta, 37 microns long. Femora each with two setae, both 35 microns long ; dorsal seta clavate, spinose ; ventral seta lanceolate spinose. Genua each with two dorsal setae : inner member of pair narrowly clavate, spinose, 29 microns ; anterior seta broadly clavate, spinose, 33 microns long. Tibiae each with five setae and a sensory solenidion : dorso-central seta clavate, spinose, 38 microns ; external dorso-lateral seta narrow, spinose, 47 microns ; internal laterals narrow, spinose, 39 microns and external lateral similar ; ventral seta quite narrow, spinose, 48 microns long ; sensory solenidion dorsal, near anterior edge of segment, 15 microns long. Tarsi each with nine setae and a sensory solenidion (Omega I), 59 microns long. Omega I nearly adjacent to lanceolate, spinose guard seta, this 68 microns long. All leg segments striate and/or microtuberculate.

Legs II : coxae each with one lanceolate, spinose seta, 26 microns long. Trochanters each with one spinose, narrowly clavate seta 47 microns long. Femora each with two setae : dorsal seta broadly clavate, spinose, 32 microns ; ventral seta spinose, obovate, 30 microns long. Genua each with two setae : dorsals as on preceding segment, 30 microns ; lateral seta narrow, spinose, 27 microns long. Tibiae each with four setae and a sensory solenidion dorsally : dorso-central seta of segment clavate, spinose, 39 microns ; dorso-lateral seta narrow, spinose, 38 microns ; ventral pair narrow, lanceolate, spinose, about equal in length, 70 microns long ; sensory solenidion arising on a nipple near the dorso-central seta, it projecting anteriorly, 38 microns long. Tarsi each with seven setae and a ventral sensory solenidion, 56 microns long.

Legs III : coxae each with two narrow, spinose, setae, about equal in length, 60 microns. Trochanters each with two setae, both narrowly clavate, spinose, about equal in length, 33-35 microns. Femora each with two setae : external lateral seta spinose, 29 microns ; dorsal seta spinose, broadly clavate, 38 microns long. Genua each with two setae : external lateral member of pair spinose, clavate, 35 microns ; dorsal seta similar, 30 microns long. Tibiae each with four setae and a long dorsal sensory solenidion : three setae of segment rod-like, densely spinose, about equal in length, 39-42 microns ; internal ventral member lanceolate, spinose, 75 microns long ; sensory solenidion 45 microns long. Tarsi each with seven setae and a sensory solenidion, this 54 microns long.

Legs IV : coxae each with two spinose setae, about equal in length, 30 microns long. Trochanters each with one narrowly spinose seta, 36 microns long. Femora each with one broadly clavate, spinose dorsal seta, 36 microns long. Genua each with two setae : external lateral member narrow, spinose, 41 microns ; dorsal seta spinose, broadly clavate, 33 microns long. Tibiae each with four setae and a dorsal sensory solenidion ; dorsal pair of segment similar, rod-like, spinose, 51 microns ; external ventral seta similar to dorsals, shorter, 46 microns ; internal ventral seta lanceolate, spinose, 81 microns long ; sensory solenidion 45 microns long. Tarsi each with seven setae and a sensory solenidion, this 54 microns long. All tarsal claws hooked ; empodia with ventrally directed tenent hairs. Average length of three males 263 microns ; including rostrum 288. Average width of these 144 microns.

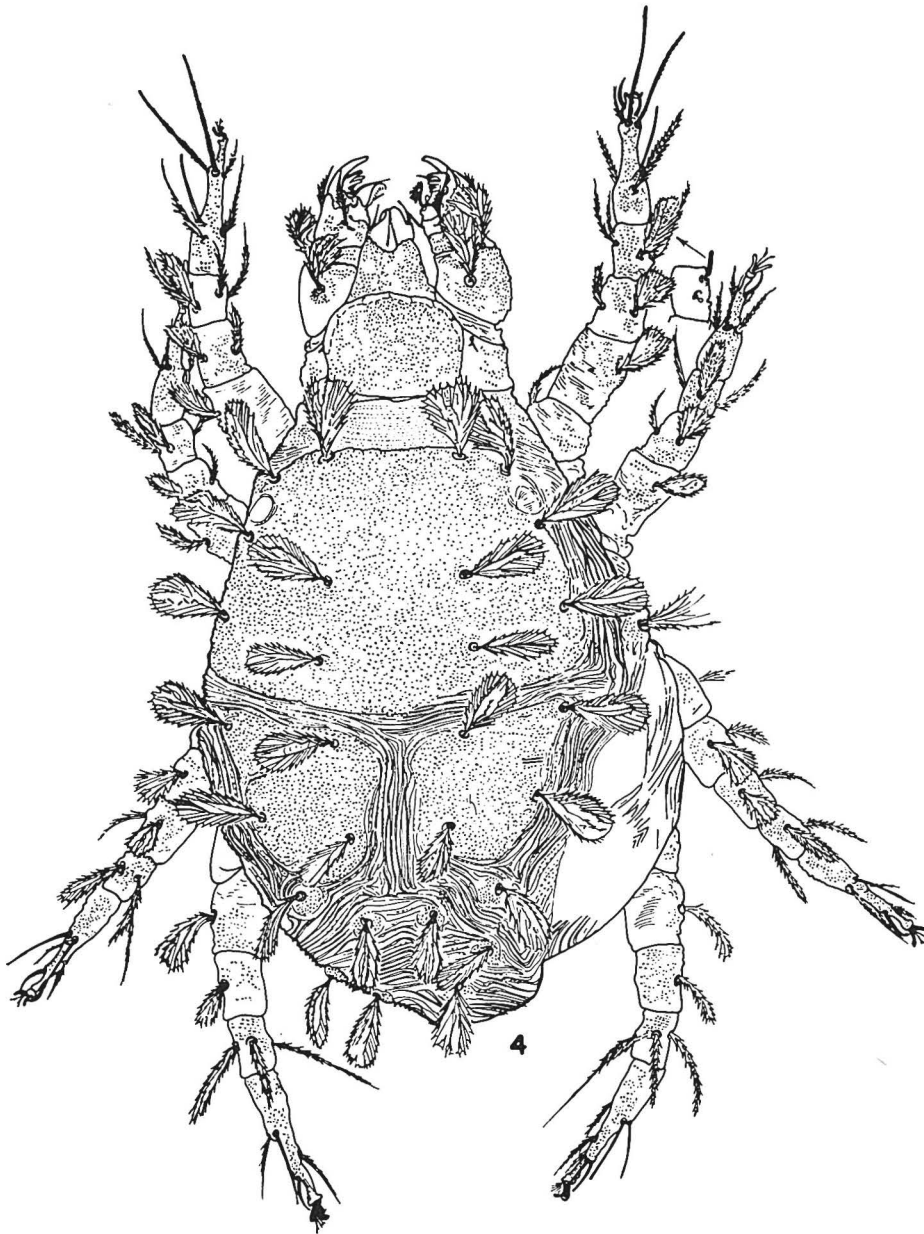


FIG. 4 : *Pavlovskicheyla platydemae* : Dorsal view of nymph II.

NYMPH II (Fig. 4). — Palpal tarsi each with two combs and two sickles. Sensory solenidion present ventrally. Palpal tibial claws edentate. Palpal tibiae each with three setae : dorsal seta of segment lanceolate, pinnate, 29 microns ; internal lateral seta smooth, 18 microns, and ventral seta of segment stout, spinose, 46 microns long. Palpal genua each with two setae : dorsolateral seta clavate, spinose, 26 microns ; ventral seta narrowly clavate, spinose, 21 microns long. Palpal femora each with three setae : dorsal seta broadly clavate, spinose, 39 microns ; external ventral seta clavate, spinose, 30 microns ; inner seta of segment lanceolate, narrow,

similar to preceding, 26 microns long. Palpal coxae each with a sensory solenidion dorsally, 4 microns long. All segments of pedipalps microtuberculate. Rostrum short, about as long as protegmen. Protegmen concave anteriorly, covered with microtubercles. Tegmen similar, the tuberculations sparser. Peritremes composed of 3-4 sausage-like segments per side. Hypostoma with one pair of spinose setae, 46 microns long. Idiosoma with 15 pairs of dorsal setae including humerals.

Propodosoma : four pairs of clavate, spinose dorsolaterals and two pairs of similar dorso-centrals. Eyes present between second and third pairs of laterals. Shield with microtubercles.

Hysterosome : two large platelets present separated from one another and from propodosomal plate by rows of dotted striae : first and second pairs of laterals and first and second pairs of centrals on a large platelet ; third, fourth and fifth laterals each on trivial platelets as well as the third pair of centrals ; platelets with microtubercles.

Idiosomal venter : one pair of lanceolate, spinose setae between coxae I and II ; one pair between coxae III ; one pair between coxae IV and one pair of similar setae midway between coxae IV and the genitalia. All setae about equal in length, 25 microns long, each on a trivial platelet. Ventro-central area from just anterior to coxae I to just between coxae IV striate longitudinally, the striae dotted. Genitalia : one pair of setose, spinose paragenitals 16 microns ; two pairs of similar genitals, 10-15 microns and two pairs of anals, as shown.

Legs I : coxae each with two acicular, spinose setae, 36 microns long. Trochanters each with one spinose seta, 29 microns long. Femora each with two setae : dorsal member broadly clavate, spinose, 30 microns ; ventral seta narrowly clavate, 31 microns long. Genua each with two setae and a sensory solenidion : dorsal member broadly clavate, spinose, 26 microns ; internal lateral member slender, spinose, 23 microns long ; sensory solenidion on dorsum of segment, 5 microns long. Tibiae each with five setae and a sensory solenidion ; sensory solenidion on dorsum of segment, extending for half its length over the distal segment (tarsus), 17 microns long. Tarsi each with nine setae and a sensory solenidion (Omega I), this 34 microns long. Omega I inserted on a nipple-like base. Guard seta separated from Omega I by the diameter of its base ; guard seta lanceolate, pinnate, 34-46 microns long. Addorsal setae of segment ringed by spines along their lengths.

Legs II : coxae each with one acicular, spinose seta, 36 microns long. Trochanters each with one spinose seta, 31 microns long. Femora each with two setae : dorsal member clavate, spinose, 26 microns ; ventral member narrow, spinose, 30 microns long. Genua each with two setae : dorsal member clavate, spinose, 21 microns ; internal lateral seta slender, spinose, 22 microns long. Tibiae each with four setae. Tarsi each with seven setae and a sensory solenidion ; solenidion situated latero-ventrally, 12 microns long.

Legs III : coxae each with two setae : outermost member of pair stout, spinose, 39 microns ; central member slender, spinose, 38 microns long. Trochanters each with two similar, spinose setae : lateral member 23 microns ; ventral member 32 microns long. Femora each with two setae : dorsal member clavate, spinose, 26 microns ; lateral member slender, spinose, 23 microns long. Genua each with two setae : dorsal seta clavate, spinose, 21 microns ; lateral member slender, spinose, 31 microns long. Tibiae each with four setae. Tarsi each with seven setae.

Legs IV : coxae each with two similar spinose setae, 27-30 microns long. Trochanters each with one clavate, spinose seta, 31 microns long. Femora each with one clavate, spinose seta 39 microns long. Genua each with two clavate, spinose setae, 27 microns long. Tibiae each with four setae. Tarsi each with seven setae. All claws hooked and with ventrally directed tenent hairs. Length of nymph II 291 microns ; including rostrum 310 microns ; width 169 microns.

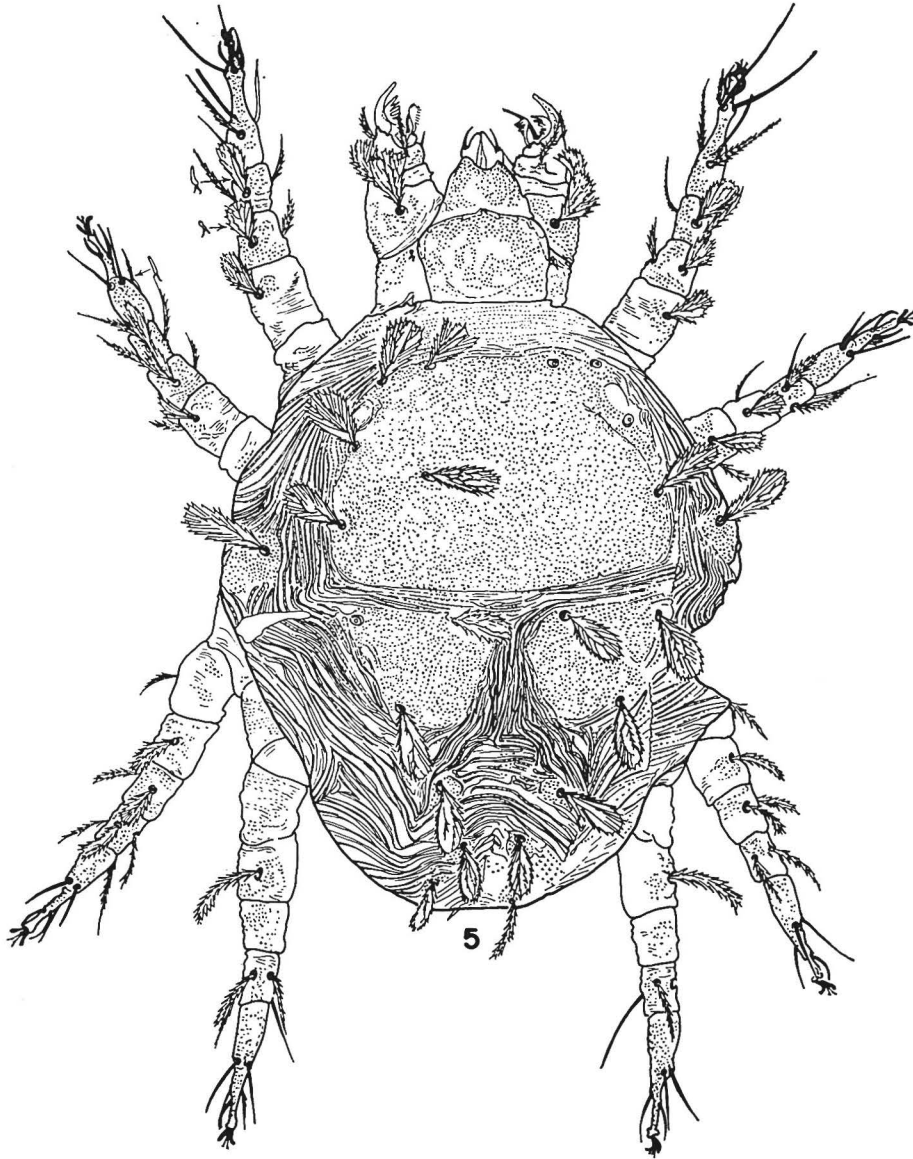


FIG. 5 : *Pavlovskicheyla platydemae* : Dorsal view of nymph I.

NYMPH I (Fig. 5). — Palpal tarsi each with two sickles and two combs, sensory solenidion present ventrally. Palpal tibial claws edentate. Palpal tibiae each with three setae : dorsal tibial seta broadly lanceolate, pinnate, 26 microns long ; ventro-external seta spinose, 26 microns

and internal lateral seta smooth, 17 microns long. Palpal genua each with one broadly clavate seta, 26 microns long. Palpal femora each with two setae : dorsal member broadly clavate, spinose, ribbed, 30 microns ; ventral member slender, spinose, 21 microns long. Palpal coxae each with one dorsal sensory solenidion 3-4 microns long. Rostrum short. Prolegmen excavate or concave anteriorly and covered with microtubercles. Peritremes composed of five sausage-like links per side. Tegmen with microtubercles. Hypostomals spinose, 40 microns long. Idiosoma with twelve pairs of dorsals including humerals.

Propodosoma : four pairs of clavate, spinose, ribbed laterals and one pair of similar centrals, all about equal in length, 35 microns long. Eyes present between second and third laterals. Humerals clavate, spinose, 42 microns long. Humeral setae each set on a platelet.

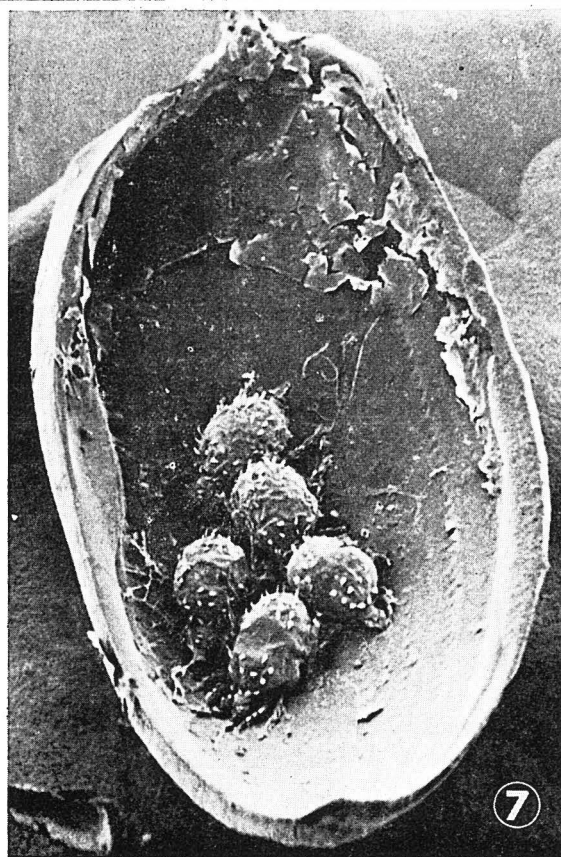
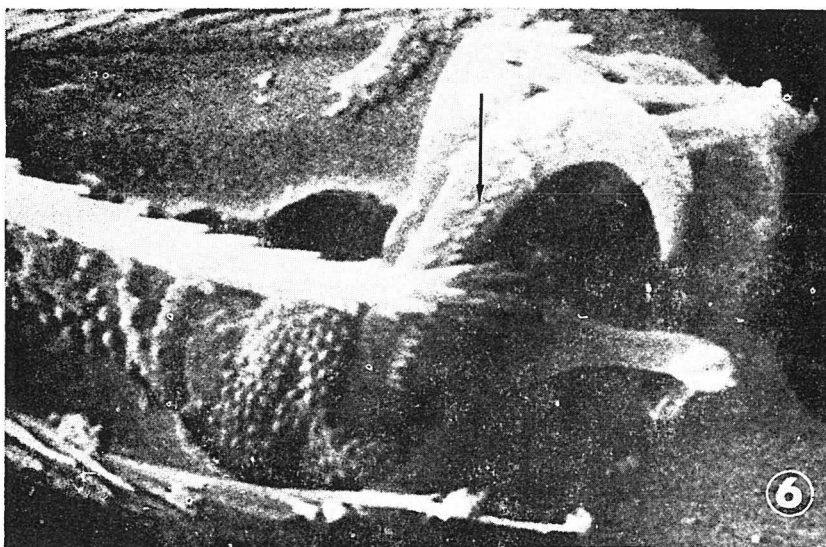
Hysterosoma : first and second laterals and first pair of centrals on a large platelet ; third and fourth pairs of setae mounted on trivial platelets. One pair of caudo-dorsals present similar to other hysterosomals. All hysterosomals about equal in length, 34-36 microns long. Dorsum of hysterosoma covered with rows of dotted striae, these all around the two large platelets and trivial platelets. Idiosomal venter with three pairs of ventro-centrals : first pair between coxae I and II slender, 23 microns ; second pair just anterior to coxae III, similar to preceding, 23 microns and third pair posterior to coxae IV, 20 microns long. All setae on trivial platelets. Genitalia terminal with three pairs of setae : two pairs of genitals and one pair of anals.

Legs I : coxae each with two spinose, slender setae, about equal in length, 30 microns long. Trochanters without setae. Femora each with two setae : dorsal member clavate, spinose, 26 microns ; ventral member lanceolate, spinose, 17 microns long. Genua each with two setae and a dorsal sensory solenidion : dorsal member broadly clavate, spinose, 23 microns ; internal lateral seta narrowly clavate, spinose, 21 microns long ; sensory solenidion 5 microns long. Tibiae each with four setae and a sensory solenidion ; solenidion extending over tarsal segment by half its length, 13 microns long. Tarsi each with nine setae and a sensory solenidion (Omega I), this 29 microns long. Guard seta spinose, stout, 39 microns long, separated from Omega I by the diameter of its base. Inner addorsal seta spinose, 56 microns ; outer similar, 44 microns long.

Legs II : coxae each with one spinose seta, 31 microns long. Trochanters without setae. Femora each with two setae : dorsal seta broadly clavate, spinose, 26 microns ; ventral seta slender, spinose, 25 microns long. Genua each with two setae : dorsal seta broadly clavate, spinose, 21 microns ; internal lateral seta slender, 17 microns long. Tibiae each with four setae. Tarsi each with seven setae and a ventro-internal lateral sensory solenidion, 9 microns long.

Legs III : coxae each with two setae : anterior seta narrowly clavate, spinose, 27 microns ; posterior member very narrow, spinose, 31 microns long. Trochanters each with one narrowly clavate, spinose seta, 26 microns long. Femora each with one broadly clavate, spinose seta, 26 microns long. Genua each with two setae about equal in length, 23 microns. Tibiae each with four setae. Tarsi each with seven setae.

Legs IV : coxae and trochanters each without setae. Femora each with one stout, spinose seta, 39 microns long. Genua each without setae. Tibiae each with four setae. Tarsi each with five setae. All claws hooked and with ventrally directed tenent hairs. Length of nymph I 263 microns ; including rostrum 282 microns. Greatest width 159 microns.



FIGS. 6-7 : *Pavlovskicheyla platydemae* : 6) Lateral spines on claws of female, 10,500 X ;
7) Habitat of mites under elytron of *Platydemus ruficornis* (Sturm), 60 X.

Disposition of types : Holotype female, allotype and paratype nymph II collected from hickory bark 12 miles N. Columbia, Boone Co., Missouri on U. S. Highway 63 on January 27, 1973 ; paratype nymph I collected from walnut tree bark, Ft. Leonard Wood, Pulaski Co., Missouri on September 18, 1972. Holo-, allo- and both nymphal paratypes to be deposited in the collection of the Entomology Research Museum, University of Missouri, Columbia. Paratype female collected from under the elytra of *Platydemus ruficornis* (Sturm) from the Ashland Wildlife Refuge, Ashland, Boone Co., Missouri on September 13, 1972 and paratype male collected seven miles south of West Plains, Howell Co., Missouri from red oak tree bark on October 4, 1972 also to be deposited in the collection of the Entomology Research Museum, Univ. Missouri, Columbia. Paratype female collected from under the elytra of *P. ruficornis* on the Ashland Wildlife Refuge, Ashland, Boone Co., Missouri on September 13, 1972 and a paratype male collected under walnut bark, Ft. Leonard Wood, Pulaski Co., Missouri on September 18, 1972 both to be deposited in the collection of the U. S. National Museum, Washington, D. C. Paratype female from elm tree bark, Roaring River State Park near Cassville, Barry Co., Missouri on April 26, 1972 and a paratype male from birch tree bark, Ft. Leonard Wood, Pulaski Co., Missouri on September 27, 1972 both to be deposited in the collection of the Snow Museum, University of Kansas, Lawrence. Paratype female and male from hickory tree bark, 12 miles N. Columbia on Hwy. 63, Boone Co., Missouri on January 27, 1973 to be deposited in the collection of the Department of Entomology, University of California, Davis. Paratype female collected from shagbark hickory bark in Columbia, Boone Co., Missouri on May 7, 1972, and paratype male collected from under birch tree bark, Ft. Leonard Wood, Pulaski Co., Missouri on September 27, 1972 both to be deposited in the Canadian National Collection, Ottawa. Paratype female and male from under the elytra of *P. ruficornis* collected one mile E. Jct. of CC and Rt. 149, Adair Co., Missouri on June 13, 1973 to be deposited in the collection of the British Museum (Natural History).

This species is an ectoparasite of a small tenebrionid beetle, *Platydemus ruficornis* (Sturm), living for most of its life under the wing covers or elytra of this beetle (Fig. 7). The mites attach to the delicate lining of the underside of each elytron in an inverted position and walk about on it when disturbed. The number of mites may vary from only one to as many as six to ten per elytron. Observations of live mites on the beetles reveal that the mites live on some food source obtained via the stylets from the lining of the elytra. The color of the live mites is lemon yellow ; the bodies of the mites become quite distended by the food matter.

The beetles are usually found in aggregations or clusters under the bark of dead trees such as elm (*Ulmus*) or hickory. TRIPLEHORN (1965) gives the distribution of this species in his revision of the Diaperini North of Mexico. Laboratory attempts to culture the beetles have not met with success.

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