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Lectotype Designations and Redescription of *Vejovis wupatkiensis* Stahnke (Scorpiones: Vaejovidae)

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Abstract.—The syntypes of *Vejovis wupatkiensis* Stahnke were studied. A lectotype, allolectotype and 6 paralectotypes are designated, and the species is redescribed based on the lectotype. It is concluded that the nearest relatives to V. *wupatkiensis* Stahnke are *Serradigitus gertschi* (Williams) and *Serradigitus torridus* Williams and Berke. The current placement of V. *wupatkiensis* within the genus *Serradigitus* (i.e., *S. wupatkiensis* (Stahnke)) is confirmed.

INTRODUCTION

In 1940, **H.** L. Stahnke published an abstract of his 1939 doctoral dissertation on the scorpions of Arizona. In it, his characterization of the new species encountered were sufficient to validate and make available 9 new species-group names and one genus-group name. Stahnke named one of these new species *Vejovis wupatkiensis* after its type locality at Wupatki National Monument. This species was distinctive because of its elongate pedipalp fingers, elongate terminal pedipalp denticle, and swollen basal teeth of the female pectines. Subsequently, several related new species have been found and described. The phylogenetic relations among these taxa has remained obscure until recently because the types of V. *wupatkiensis* were not available for study. The purpose of this paper is to designate a lectotype, an allolectotype, and 6 paralectotypes for V. *wupatkiensis,* to redescribe the species based on the lectotype, and to confirm its current placement within the genus *Serradigitus* Stahnke. The measurements given are as described by Williams (1980:2-3).

Serradigitus wupatkiensis (Stahnke)

(Figure 1, Table 1)

Vejovis wupatkiensis Stahnke 1940:105. Gertsch and Allred 1965:8. Soleglad 1972:180-181.

Vaejovis wupatkiensis Stahnke. Johnson and Allred 1972:168-169. Williams 1976:2.

Serradigitus wupatkiensis (Stahnke). Stahnke 1974:130-132. Williams and Berke 1986:(in press).

Diagnosis.—Small, slender species of *Serradigitus,* adults to 35 mm long. Body uniform whitish yellow to amber-brown. Frontal margin of carapace straight to slightly emarginate; chela of pedipalps long and slender, movable finger longer than carapace, ratio of chela length to palm length 5.6 in males, 5.0 in females. Brachium

width approximates palm width; chela with supernumerary denticles 6/7 on fixed and movable fingers respectively; primary row denticles subdivided into 2-3 subrows of sharp serrate denticles by slightly enlarged denticles, chelicerae lacking denticles on ventral margin of fixed finger; stigma short, oval, 2-3 times longer than wide, ratio of carapace length to stigma length 14-15. Telson with small subaculear tubercule.

Similar to *Serradigitus gertschi* (Williams) and *Serradigitus torridus* Williams and Berke. Distinguished from *S. gertschi* by smooth to obsolete inferior median keels of metasomal segment I (not crenulate); differs from *S. torridus* by presence of 4 prolateral macrosetae on pedipalp humerus (not 5).

Redescription based on lectotype.—Female. Coloration: Carapace, mesosoma, metasoma, pedipalps, and walking legs uniform golden brown; pedipalp fingers similar to palm in color; pectines and genital operculum slightly more whitish, no other contrasting markings. Prosoma: Carapace frontal margin slightly concave, with 3 pairs macrosetae; lateral ocelli 3 per group, median ocelli small, similar to most cephalad lateral ocelli in size, interocular space wider than median ocellus diameter; dorsal surface finely granular; sternum broadly pentagonal, wider than long, 3 pairs sternal setae. Mesosoma: Terga 2-6 with subtle obsolescent median keel, tergum 7 with short, obsolescent median keel and 2 pairs well developed serrate

Table 1. Measurements (mm) of *Vejovis wupatkiensis*. Abbreviatins are as follows: 1 = length, w = width, d = depth, fmd = frontal margin distance, ditd = distal internal trichobothrium distance, p-row = primary denticle row of chela.

	lectotype #67 (female)	*lectoallotype (#75.3) (male)*
Total length	33	25
Carapace, (1/w at median eyes)	4.3/3.2	3.1/2.4
Diad (width/fmd)	0.6/1.4	0.5/1.2
Metasoma, length	15.2	11.4
Segment I (l/w/d)	2.1/2.5/2.0	1.5/1.8/1.4
Segment II (l/w/d)	2.4/2.3/2.0	1.8/1.8/1.4
Segment III (l/w/d)	2.6/2.3/2.0	2.0/1.7/1.5
Segment IV (Vw/d)	3.5/2.3/2.0	2.6/1.7/1.4
Segment V (Vw/d)	4.6/2.2/2.0	3.5/1.6/1.4
Telson, length	5.7	3.0
Vesicle (l/w/d)	4.1/1.6/1.2	1.8/1.2/0.8
Aculeus (1)	1.6	1.2
Pedipalp, Humerus (l/w)	4.3/1.2	2.9/0.8
Brachium (l/w)	4.5/1.4	3.1/0.9
Chela (1)	7.8	5.0
Palm (Vw/d)	3.2/1.4/1.4	2.1/1.0/1.1
Movable finger (1/base)	5.3/0.8	3.3/0.5
Fixed finger (l/ditd)	4.6/2.6	2.6/1.8
Fixed finger p-row denticles	47:12,35	43:12,31
Movable finger p-row denticles	43:8,7,28	43:9,7,27
Pectine teeth (left/right)	—/16	17/17
Stigma 3 (l/w)	0.3/0.1	0.2/0.1

lateral keels; genital operculum with 3 pairs setae; pectine with anterior lamella of 4 elongate sclerites, middle lamella of long quadrilateral basal piece plus 9 subcircular sclerites, fulcra triangular, 15 teeth per comb (including missing distal tooth), 2 proximal teeth more swollen, more elongate than others; stigmata small, oval, 3 times longer than wide; sternum 7 with 1 pair lightly developed, smooth to crenular, lateral keels. Metasoma: Dorsal and dorsolateral keels well developed, crenulate, terminating in elongate denticle on each posterior terminus; dorsal keels I–IV with 17-17-18-26 crenulations; ventrolateral keels with 12-17-18-26 crenulations on segments I–IV respectively; ventral keels obsolete on I, smooth to obsolete with a few obsolescent crenulations on II, lowly crenulate on III, crenulate on IV; metasomal segments short, stout, segment IV 1.5 times longer than wide. Telson: Aculeus one-third length of telson, distinct subaculear tubercule flanked with pair macrosetae, similar to aculeus in length, vesicle with about 6 pairs macrosetae approaching aculeus in length. Pedipalps: Chela long, slender, fixed finger longer than carapace, supernumerary denticles 6/7 on fixed and movable fingers respectively; primary row denticles in single, continuous, linear row, these sharp, serrate—numbering 47/43 denticles on fixed and movable fingers respectively, primary row denticles subtly subdivided into 2/3 subrows on fixed and movable fingers respectively by slightly enlarged denticles; fingers each with conspicuously elongate terminal denticle, these greater than 5 times length of first supernumerary;

fixed finger with trichobothrium *di* dorsal to supernumerary 5, trichobothrium *pi* dorsally between supernumeraries 5 and 6; palm with 1 dorsal, 2 dorsal prolateral keels, these lowly developed, crenulate; dorsal retrolateral keels smooth to obsolete. Chelicera: Movable finger ventral margin smooth, with setal comb; dorsal margin with broad basal bicuspid, 2 subterminal denticles and short terminal denticle. Fixed finger with basal bicuspid, 1 subterminal and 1 terminal denticle, no ventral margin denticles.

Variation.—Allolectotype and 6 paralectotypes examined. These similar in structure and coloration to lectotype but varied as follows: six females varied in total length from 29-32 mm, single male 25 mm; pectine teeth 15-16 (mode = 16) in females, 17 in male; females with proximal two pectine teeth swollen (one apparent subadult with proximal first tooth swollen); male pectine teeth all similar in size; fixed finger tends to be slightly shorter than carapace length (lectotype with fixed finger slightly longer than carapace length).

Types.—Lectotype (designated here), female, Arizona: Coconino Co., Wupatki National Monument, November 10, 1938, D. J. Jones ("#67, Wupatki Nat. Mnt., 11-10-38, D. J. Jones, Stahnke Collection, Type") [missing left movable pedipalp finger, right chela detached, right tarsi missing on leg 4, many setae missing]. Depository: California Academy of Sciences, Entomology Type Number 15173.

Lectoallotype, male, "#75.3 Wupatki Natl. Mnt., Before 8-38, D. J. Jones, *Vejovis wupatkiensis* Stahnke, Type." Depository: California Academy of Sciences, Entomology Type Number 15173.

Paralectotypes as follows: "#72 Wupatkia, Flagstaff, Arizona, 11-7-38, syntype-cotype" [female]; "#73.4 Wupatkia, Flagstaff, Ariz, Oct 1938, cotype" [female]; "#73.3, Wupatkia, Flagstaff, Arizona, Oct 1938, syntype-cotype" [small subadult female]; "#75.11, Wupatki, Flagstaff, Arizona, 8-10-38, syntype female [female]; "#326, Wupatki, Flagstaff, Arizona, 6-11-39" [female, not labeled as type, but apparently part of syntype series]; "#325, Wupatki, Flagstaff, Arizona, 6-9-39" [female, probably subadult]. Paralectotype Depository: California Academy of Sciences.

Remarks.—According to his doctoral dissertation (1939), Stahnke based the description of this species on 9 specimens. Of these, only eight were received by the California Academy of Sciences [from H. L. Stahnke] in 1983. The missing specimen was numbered 75.2 in the dissertation, and its location is unknown.

This species is known from northern Arizona, southern Utah, southern Nevada, and adjacent eastern California. Little geographic variation is apparent. However, I recognize a distinctive race from the Panamint Mountains of eastern California. It is characterized by having pedipalp fingers more darkly pigmented than palm, pedipalp keels outlined with contrastingly dark pigmentation, and slightly more slender pedipalp palms.

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Scientific Note

A Namatode Parasite of *Erebia occulta* Roos & Kimmich (Nematoda; Lepidoptera: Satyridae)

According to the list published by Poinar (1975, Entomogenous Nematodes, Brill, Leiden), nematode parasites have been recorded for 232 lepidopteran species, of which only 20 are butterflies. Parasitism records for North American species include: ***Pieris*** *rapae* (L.) Pieridae; *Polygonia comma* (Harris), *P. interrogationis* (Fabricius), and *Vanessa atalanta* (L.), all Nymphalidae (Puttler and Thewke, 1971, Ann. Entomol. Soc. Am., 64:1177-1178). As of November 1986, Poinar *(in litt.)* had no nematode parasite records for the Satyridae. The nematode group responsible for parasitism in butterflies is the Mermithidae, which are obligate parasites. They have no free-living or nourishment-receiving stages outside of their hosts. Most of the moth nematode parasites are also Mermithidae, but there are 6 records of Steinernematidae, which behave as both facultative and obligate parasites, and one record for Rhabditidae, which are facultative parasites.

In Alaska on the morning of 3 July, 1986 I collected a male specimen of *Erebia occulta* Roos & Kimmich (Satyridae) as it was flying over a low scree slope at mile 41.5 Nome-Council Road (64°39'N, 164°20'W, 30-120 m). The specimen was papered and subsequently relaxed for spreading. When removed from the relaxing chamber, about 5 mm of a mermithid was found protruding from the 7th abdominal segment of the specimen, through which it had apparently bored a hole before dying. Using forceps, the worm was carefully extracted. When measured, it extended 10.1 cm. The butterfly's abdomen measured 9 mm. The nematode was placed in 70% isopropanol and sent for identification to Dr. George 0. Poinar, Jr. at the University of California, Berkeley, who determined that it was a "postparasitic juvenile and could not be identified past family level (Mermithidae)."

Figure 1. Specimen of *Erebia occulta* from which 10.1 cm juvenile mermithid was extracted. Scale = cm.