Pholcus muralicola Maughan & Fitch, 1976

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A NEW PHOLCID SPIDER FROM NORTHEASTERN KANSAS (Arachnida: Araneida)

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ABSTRACT

A new spider of the family Pholcidae is described and discussed.

The spider fauna of the University of Kansas Natural History Reservation in the northeastern corner of Douglas County, Kansas was investigated over a period of years; collections were made from 1950 to 1962, and representative specimens were submitted to leading authorities for identification. Finally, a paper was published (Fitch, 1963) describing the 192 kinds identified with brief accounts of their local habits and habitats. Most of the species found were already known from other parts of the United States, and some also from other parts of the world. One exception was a small pholcid not identifiable with any known species. The relationships, habits and annual cycle of this species were the subject of intensive investigation by the first author in 1967.

The pholcids are primitive spiders (order Araneida, suborder Labidognatha) having legs long and threadlike, giving them a superficial resemblance to harvestmen (Phalangida). The family is represented by few species in North America, and some of these are commensals that have been transported to various parts of the world by man. The possibility that the present species might be an exotic of recent introduction was thought to merit consideration, and delayed our publishing a description of the species as new.

The species here described was first found by the second author in 1950, beneath massive slabs of limestone at the base of an old rock wall. The land that is now the Natural History Reservation was settled in the early 1870's and at that time rock walls of the native Oread Limestone were built on the section comprising the Reservation, running its length for a mile along the east boundary, and bisecting it from north to south, and from west to east across the middle. These walls also extended into the adjoining section on the north that is now the University's Rockefeller Experimental Tract. Flat rocks of variable size, some weighing several hundred pounds, were used in construction of the walls, with the largest ones at the

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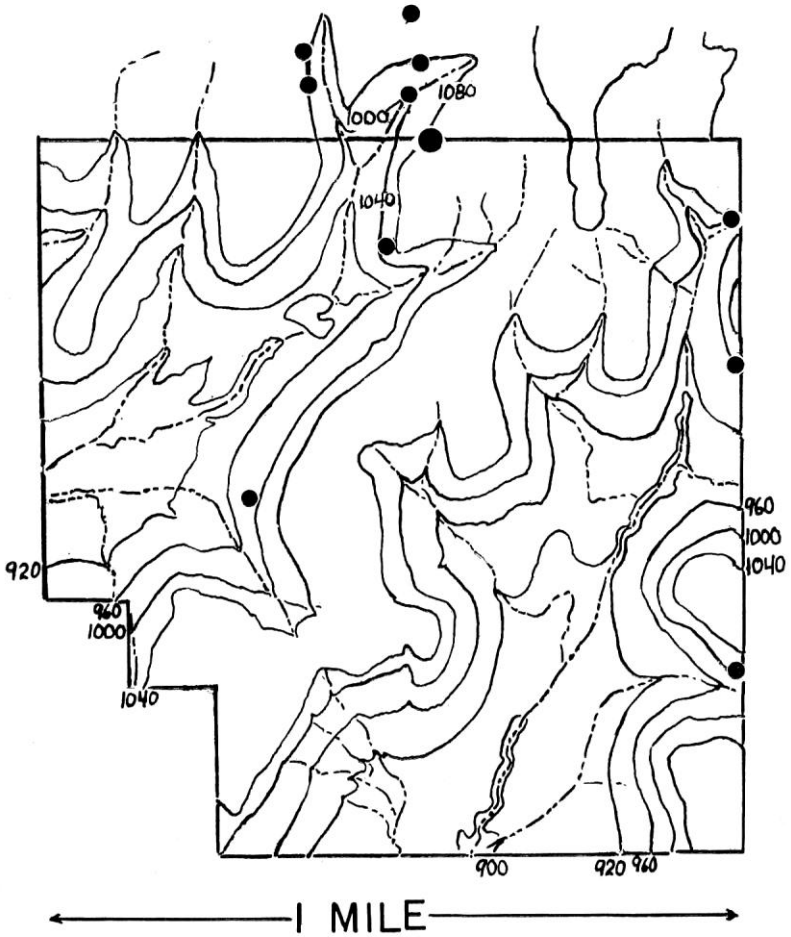


FIG. 1. Contour map of University of Kansas Natural History Reservation Section 4, Township 12S, Range 20E, in the northeastern corner of Douglas County, Kansas, and adjacent edge of Jefferson County, showing sites where *Pholcus muralicola* was collected in 1967 (dots). Large dot shows collection site of holotype.

base. The walls were originally 3½ to 4 feet high and 2 to 3 feet wide. In the early 1900's much of the rock was hauled away for construction in Lawrence, but remnants of the walls remain, mostly on steep hillsides. The spiders were found exclusively in the interstices between or beneath rocks in the wall that had lain in place for nearly 100 years. Eventually they were found at 11 sites well-scattered over an area ¾ mile wide from east to west and just under a

TABLE 1. Data for the body proportions of males of *Pholcus muralicola* in mm.

Character	Number of Specimens	Range	Mean	Holotype
Body length	19	3.0– 4.1	3.7	3.9
Cephalothorax length	15	1.0– 1.4	1.2	1.1
Abdomen length	15	1.8– 2.5	2.0	2.1
Cephalothorax width	12	0.9– 1.5	1.1	1.0
Abdomen width	12	0.8– 1.4	1.1	1.2
First Femur	12	7.2– 8.3	7.7	7.9
First Patella plus Tibia	12	7.5– 8.6	8.0	8.3
First Metatarsus	12	9.8–14.0	12.2	12.9
First Tarsus	12	0.9– 2.2	1.8	1.7
First leg Total Length	12	27.0–31.6	29.6	30.8
Second Femur	15	4.9– 6.3	5.7	5.6
Second Patella plus Tibia	15	5.0– 6.0	5.4	5.2
Second Metatarsus	15	6.0– 8.4	7.4	6.0
Second Tarsus	15	1.0– 1.3	1.2	1.1
Second leg Total Length	15	18.6–21.9	19.7	17.9
Third Femur	15	3.9– 4.7	4.2	4.6
Third Patella plus Tibia	15	3.2– 4.5	3.6	3.5
Third Metatarsus	15	4.7– 5.4	4.9	5.1
Third Tarsus	15	0.8– 1.0	0.9	0.9
Third leg Total Length	15	13.1–15.2	13.8	14.1
Fourth Femur	17	4.2– 5.9	5.5	5.2
Fourth Patella plus Tibia	17	3.9– 5.2	4.6	4.7
Fourth Metatarsus	17	5.7– 7.6	6.3	6.3
Fourth Tarsus	17	0.9– 1.2	1.0	1.0
Fourth leg Total Length	17	15.0–18.8	17.0	17.2

mile from north to south (Fig. 1). Originally, the spiders must have come from some natural habitat to occupy the man-made wall. Most likely, original habitat seemed to be the cracks and fissures of the Oread Limestone along the hilltop outcrops at two main levels extending in an irregular course for a combined distance of 4.5 miles on the Reservation. The spiders have never been seen along the outcrops, but because of their secretive habits and the sheltered situations that they frequent, their hiding places in natural fissures would be virtually impregnable. No doubt the spiders occur on nearby land beyond the limits of the Reservation and Rockefeller Experimental Tract, but the necessity of tearing down rock walls to search for them has prevented intensive sampling. The specialized habitat requirements, limitation to a microhabitat in native deciduous forest, and dissociation from humans or true edificarian structures strongly suggests that the spider is a native species in its natural range and habitat.

At the writers' requests, Dr. Willis J. Gertsch and the late Dr. H. (Exline) Frizzell compared our specimens with Old World species of *Pholcus*, including *P. phalangioides* and *P. opilonoides* and determined that it was not identifiable with known kinds.

TABLE 2. Body proportions of females of *Pholcus muralicola* in mm.

Character	Number of Specimens	Range	Mean	Allotype
Body length	24	3.0– 4.2	3.9	4.1
Cephalothorax length	21	1.0– 1.4	1.2	1.3
Abdomen length	21	1.9– 2.7	2.3	2.7
Cephalothorax width	13	0.8– 1.3	1.1	1.3
Abdomen width	13	1.0– 1.9	1.4	1.8
First Femur	16	6.0– 7.2	6.8	7.0
First Patella plus Tibia	16	6.3– 7.4	6.8	7.0
First Metatarsus	16	9.4–10.8	10.1	10.3
First Tarsus	16	1.8– 2.0	1.8	1.7
First Leg Total Length	16	23.0–27.2	25.1	26.0
Second Leg Femur	24	4.3– 5.5	5.0	4.9
Second Patella plus Tibia	24	3.9– 5.0	4.6	4.8
Second Metatarsus	24	5.7– 7.2	6.3	6.6
Second Tarsus	24	1.0– 1.3	1.2	1.1
Second Leg Total Length	24	15.9–19.1	17.2	17.5
Third Leg Femur	24	3.2– 4.2	3.7	3.7
Third Patella plus Tibia	24	2.9– 3.8	3.4	3.7
Third Metatarsus	24	3.9– 4.8	4.3	4.5
Third Tarsus	24	0.8– 1.0	0.9	0.9
Third Leg Total Length	24	11.3–13.3	12.1	12.0
Fourth Leg Femur	24	4.4– 5.4	5.0	5.3
Fourth Patella plus Tibia	24	3.8– 4.6	4.3	4.5
Fourth Metatarsus	24	4.6– 6.4	5.6	5.8
Fourth Tarsus	24	0.9– 1.1	1.0	1.0
Fourth Leg Total Length	24	14.0–17.0	15.8	16.6

MATERIALS AND METHODS

Collections of the spiders were made at monthly intervals in 1967. They were examined under 20 power magnification and were measured as follows: length overall, length and width of cephalothorax and of abdomen, lengths of femur, patella plus tibia, metatarsus, tarsus, and total for extended leg. Measurements were recorded to the nearest 0.1 millimeter. Legs measured were those on the right side of the body.

The condensed descriptions of the family and genus included here are based upon those of Simon (1836), Petrunkevitch (1928), Kaston (1948) and Chickering (1950). Descriptions of similar species, *Pholcus phalangioides* and *P. opilionoides* by Becker (1892), Pocock (1893), Emerton (1902), Kaston (1948), Chickering (1950), and Wiehle (1953) were used for comparison.

Description of the Family Pholcidae

Eyes 8 (or 6), 2 small anterior median eyes (AME) dark, located near together approximating midline on anterior part of eye hillock; other 3 pairs of eyes grouped in a pair of triangles each pair on its

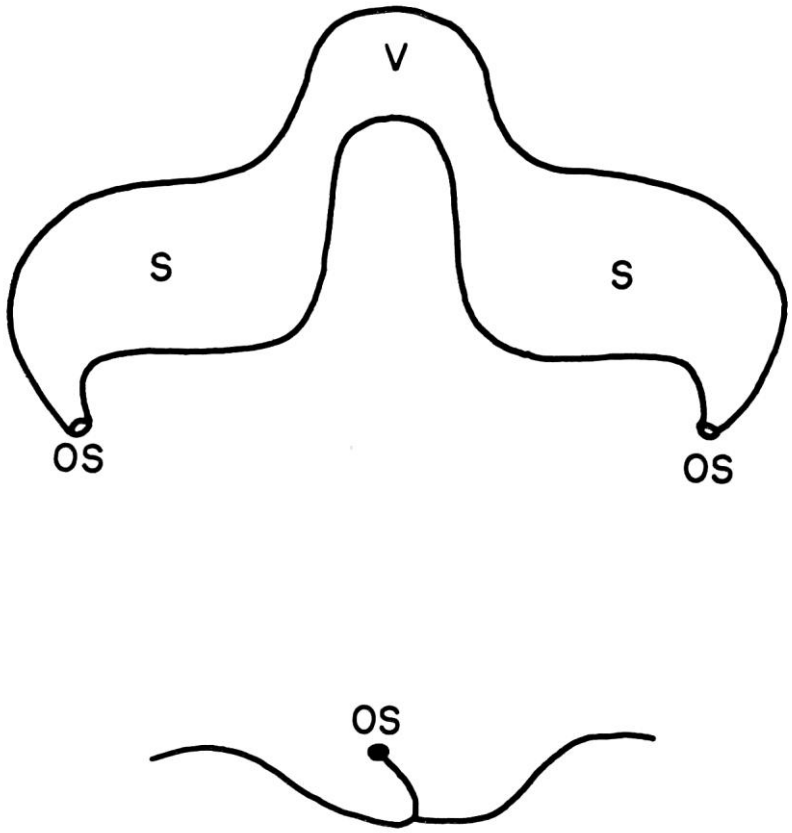
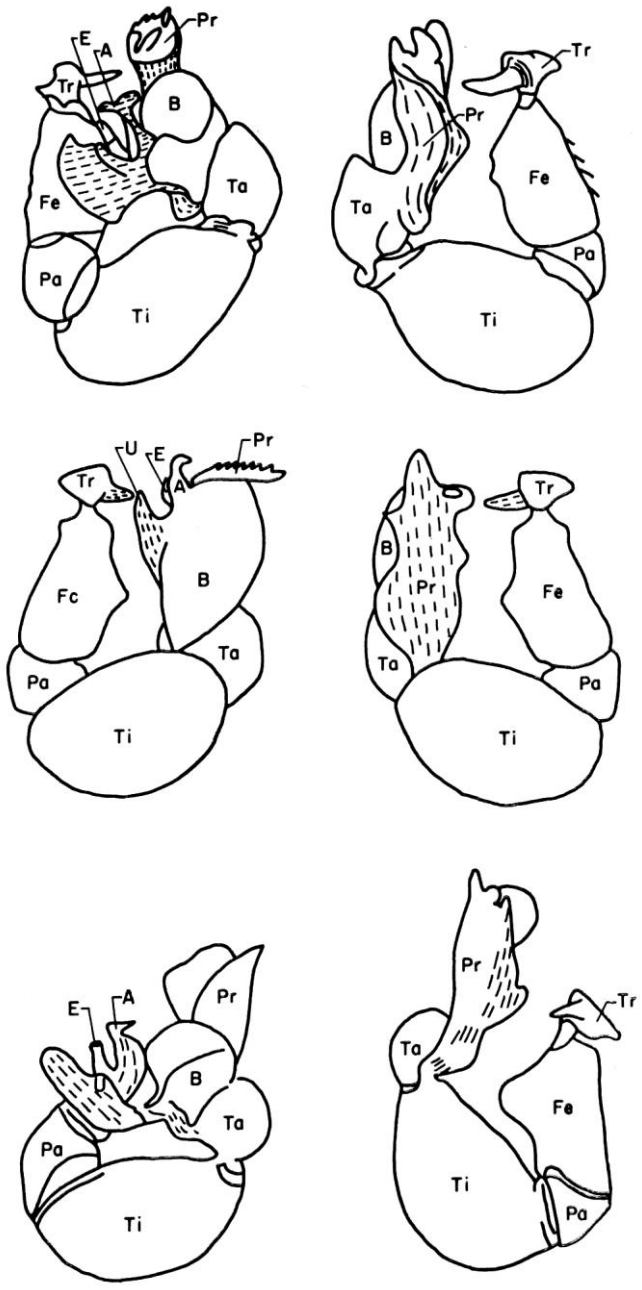


FIG. 2. Internal structure of the epigynum of *Pholcus muralicola* (a) Os—Opening of the Spermatheca, S—Spermatheca, and V—Vulva. Epigynal hillock in *Pholcus muralicola*, (b) Os—Opening of the Spermatheca.

hillock; tarsi long, flexible with transverse creases (pseudosegments); 3rd claw sometimes absent or rudimentary; claw tufts lacking; chelicerae joined along midline, lacking boss, each armed with 3 teeth; colulus rudimentary; 2–6 spinnerets; body globose, elongate, cylindrical; cephalothorax wide; web of irregular sheet, irregular mesh, or interlacing threads.

Description of the Genus *Pholcus*

Eyes 8; median ocular area much broader than long; anterior median eyes closer together than anterior lateral eyes; abdomen cylindrical, about 3 times as long as wide; carapace width greater than length.



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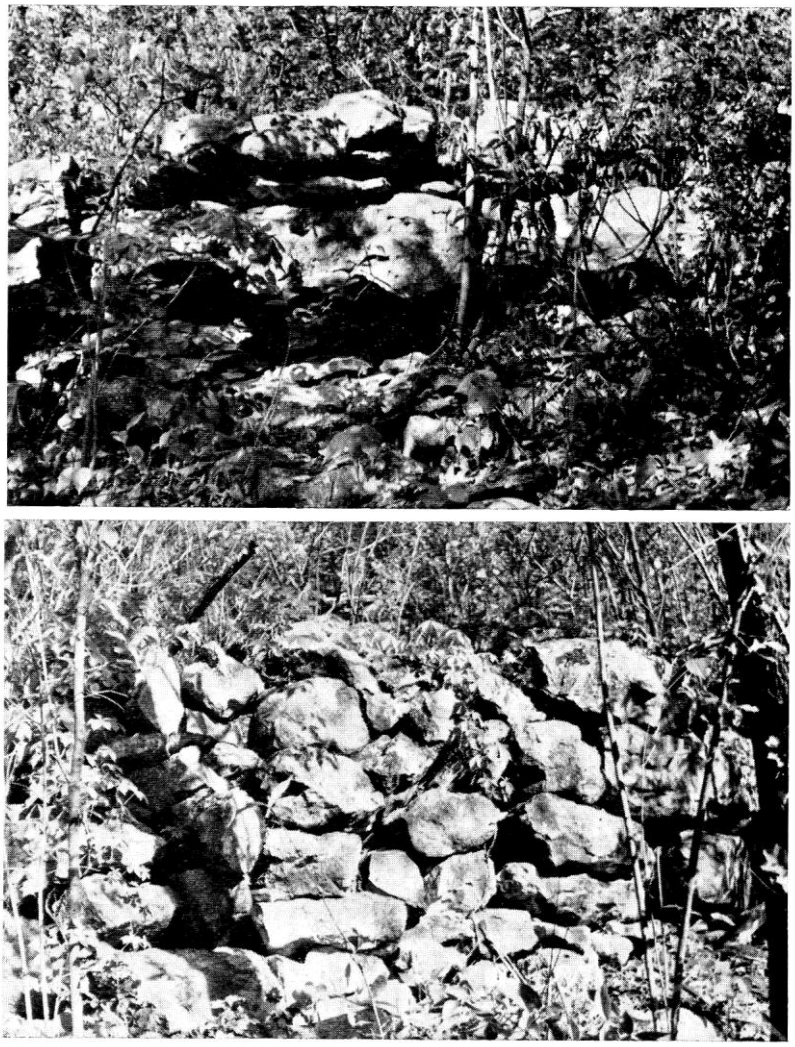

FIG. 4. Old rock walls in woodland of the University of Kansas Natural History Reservation, habitat of *Pholcus muralicola*.

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FIG. 3. The palp of *Pholcus opilionoides* (a) from Wiehle 1953; *Pholcus muralicola* (b); and *Pholcus phalangioides* (c) from Wiehle 1953. A—Appendix, B—Bulbus, E—Embolus, Fe—Femur, Pa—Patella, Pr—Prokursus, Ta—Tarsus, Ti—Tibia, Tr—Trochanter, and U—Uncus. Left—interior lateral view. Right—exterior lateral view.

Pholcus **muralicola**, new species

Holotype, male, University of Kansas Snow Entomological Museum no. 6724 collected on the University of Kansas Natural History Reservation, 1030 feet elevation, in Douglas County, .5 mi W and 2.65 yards S of point which is NE corner both of Reservation and of Douglas County, 4 March 1967, by O. E. Maughan.

Paratypes, collected on Reservation and Rockefeller Experimental Tract within .8 mi of the spot designated above as the type locality.

Diagnosis, small (adult body length less than 4.3 mm); male prokursus with serrated, straplike projection; female epigynum with hornlike internal protuberance.

DESCRIPTION

Body of male slightly smaller than female's, but with longer legs; leg formula normally 1-2-4-3; varying to 1-4-2-3 or 1-2-4-3 (Tables 1 & 2); AME on horizontal line between, and smaller than ALE, the latter apparently fused in very young specimens; carapace light yellow to dark brown; foliate area middorsally on carapace; thin black lines extending anteriorly from dark foliate area to eye hillock and occasionally extending posteriorly to pedicel; abdomen light brown, pubescent; legs colored like abdomen or slightly darker; cuticle of joints unpigmented; no reverse countershading; epigynum in midventral hillock with dark chitinized cap and with rounded lateral openings; male palpus (Fig. 3) with bulbus having several projections and strongly chitinized process with terminal projections; chelicerae and tarsi of usual pholcid types; webs in irregular mesh on several levels.

ACKNOWLEDGMENTS

Dr. Gerald R. Smith provided help and guidance. Drs. Willis J. Gertsch and Harriet Exline Frizzell identified *P. muralicola* as an undescribed species. Dr. Frizzell gave much advice and encouragement to the first author while he was a graduate student at the University of Kansas.

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Nearctic species:

♂♀ **muralicola** Maughan & Fitch, 1976 USA
P. m. Maughan & Fitch, 1976: 311, f. 2–3 (D♂♀; probably misplaced).

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1768-1770. *Ph. muralicola*, male, dorsal and lateral views; female abdomen, ventral view.

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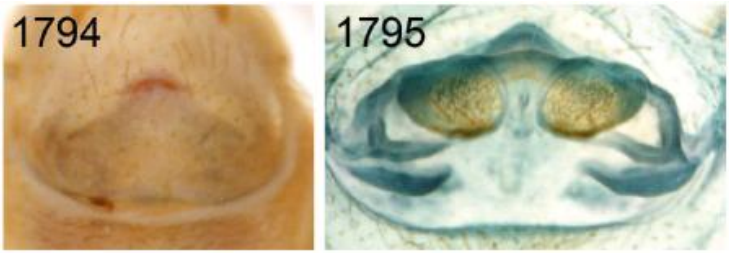

1794, 1795. *Ph. muralicola*.

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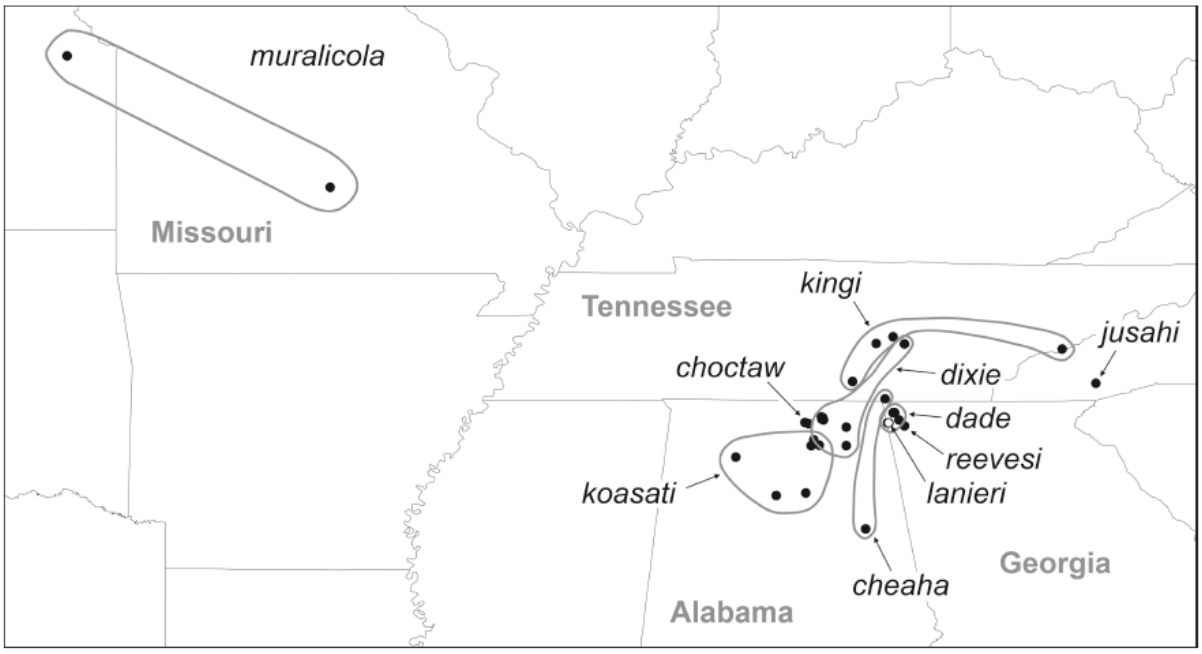

FIG. 1875. Known distribution of the *Pholcus kingi* species group. FIG. 1875. Known distribution of the *Pholcus kingi* species group.

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Pholcus muralicola Maughan & Fitch, 1976

Figs. 1768-1770, 1794, 1795, 1911-1915

Pholcus muralicola Maughan & Fitch 1976: 304-311, figs. 1, 2, 3b, 4. Brignoli 1983: 168 ("probably misplaced").

Types. Male holotype from USA, Kansas, Douglas Co., University of Kansas Natural History Reservation [39°02.5'N, 95°11.8'W], 1030 ft a.s.l., 4. iii.1967 (O.E. Maugham), in SEMK, examined. Unspecified number of paratypes (~18♂24♀, see tables 1 and 2 in Maughan & Fitch 1976) from within 0.8 miles from type locality, dates and collectors not specified, partly apparently lost (partly possibly in AMNH, see below), 2♂3♀ 2 juvs. examined (all poorly preserved), in SEMK.

Diagnosis. Easily distinguished from congeners by male palpal morphology (Figs. 1911, 1912; distinctive serrated process on procursus, appendix with slender curved process).

Male (type locality). Total body length 4.2, carapace width 1.1. Leg 1: 7.6 + 0.5 + 7.9, metatarsus and tarsus missing, tibia 2: 5.2, tibia 3: 3.6, tibia 4: 4.5; tibia 1 L/d: 78. Habitus as in Figs. 1768 and 1769. Carapace ochre-yellow with large brown mark partly divided medially, ocular area with median line, clyp-

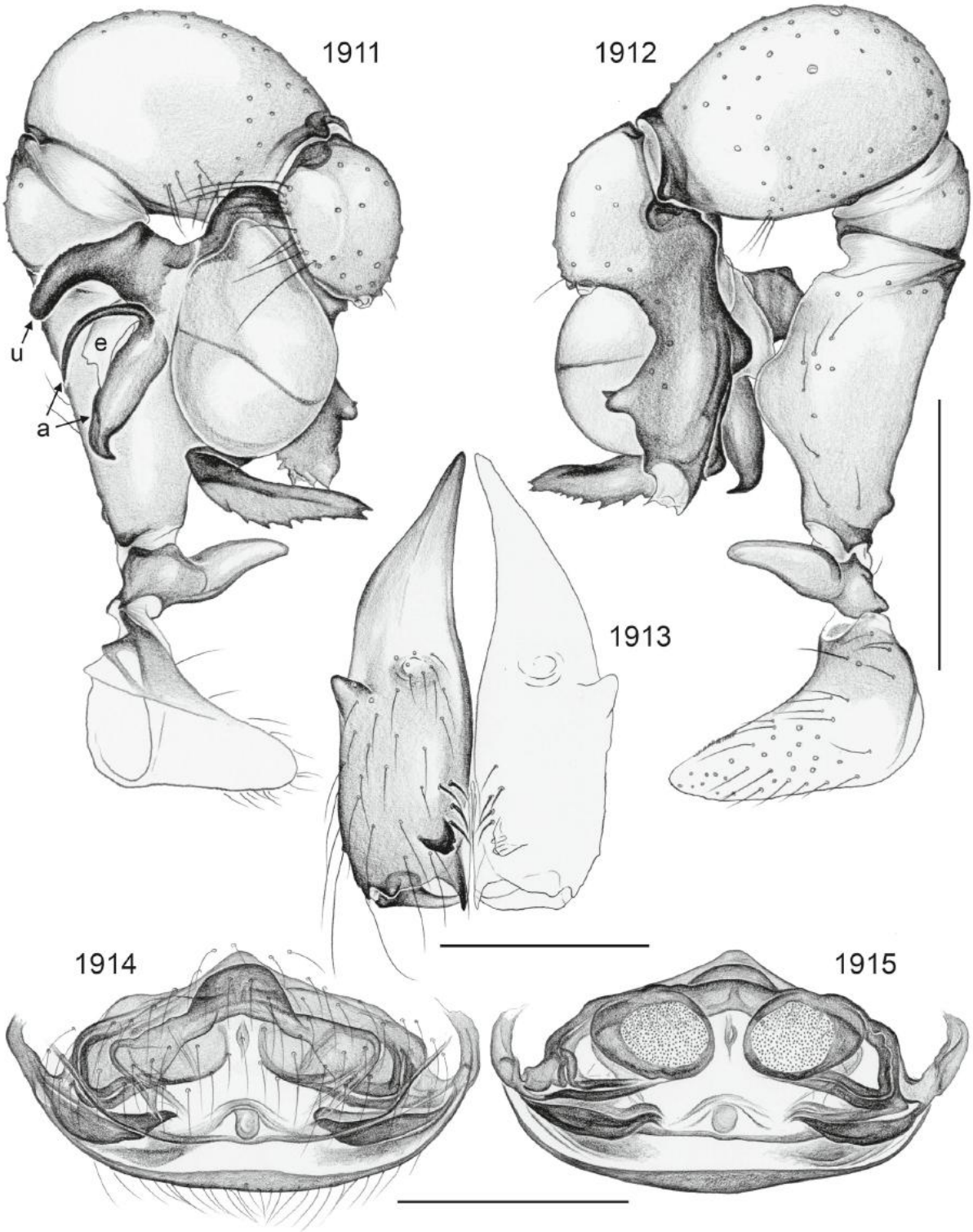

FIG. 1911-1915. *Pholcus muralicola*. 1911, 1912. Left male palp, prolateral and retrolateral views. 1913. Male chelicerae, frontal view. 1914, 1915. Cleared female genitalia, ventral and dorsal views. Scale lines: 0.5 (1911, 1912, 1914, 1915), 0.3 (1913).

eus not darkened, sternum light brown with lighter specks, legs light brown, tips of femora and tibiae lighter, abdomen monochromous, only genital area with light brown pattern. Distance PME-PME 185 µm, diameter PME 95 µm, distance PME-ALE 35 µm, distance AME-AME 35 µm, diameter AME 70 µm. Ocular area moderately elevated, few slightly stronger hairs posteriorly. No thoracic furrow; clypeus unmodified. Chelicerae as in Fig. 1913, distal frontal apophyses with two modified hairs each, with proximal frontal and lateral apophyses, stronger hairs close to distal apophyses. Sternum wider than long (0.75/0.65), unmodified. Palps as in Figs. 1911 and 1912, coxa unmodified, trochanter with retrolateroventral apophysis, femur with ventral bulge and low dorsal apophysis proximally, procursus with spine on dorsal projection, with very distinctive prolaterodistal serrated process curved towards dorsal, bulb with slender uncus, weakly sclerotized embolus, appendix consisting of two processes. Legs without spines and curved hairs, few vertical hairs; retrolateral trichobothrium on tibia 1 at 7%; prolateral trichobothrium absent on tibia 1, present on other tibiae.

Variation. Tibia 1 in two other males: 7.5, 8.1.

Female. In general similar to male, eye triads as in male (distance PME-PME 185 µm); tibia 1 in four females: 6.3, 6.6, 6.7, 7.1. Epigynum weakly sclerotized, barely elevated, with distinctive internal arc visible through cuticle anteriorly, small 'knob' (Figs. 1794, 1914); internal genitalia as in Figs. 1795 and 1915.

Distribution. Known from two localities in Kansas and Missouri respectively (Fig. 1875). Possibly extinct at type locality (B. Cutler & H. Guarisco, pers. comm., May 2010).

Material examined. USA: *Kansas*: Douglas Co., University of Kansas Natural History Reservation: ♂ holotype and 2♂3♀ paratypes above; same locality, 25.vii.1960 (2♀) and viii.1964 (2♂2♀) (possibly also paratypes), in AMNH. *Missouri*: Texas Co., 12 mi "SNW" Licking [37°30'N, 92°06'W], "FS Cave 135", 1.v.1980 (J.E. Gardner), 1♂1♀ in AMNH.