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North American Cave Pseudoscorpions of the Genus *Kleptochthonius*, Subgenus *Chamberlinochthonius* (Chelonethida, Chthoniidae)

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Recently, the cavernicolous pseudoscorpions of the genus *Kleptochthonius* Chamberlin have been treated in two papers (Malcolm and Chamberlin, 1961; and Muchmore, 1963). Owing to the great activity of bio-speleologists in recent years, however, many new forms continue to come to light. The specimens described below were sent to me by Dr. Thomas C. Barr, Jr., Dr. Carl Krekeler, and Mr. Leslie Hubricht, to whom I am particularly indebted. Types of new species described here are deposited in the collection of the American Museum of Natural History. Catalogue numbers refer to the catalogue of the author.

All the species considered here belong to the subgenus *Chamberlinochthonius* Vachon (1952), as defined by Malcolm and Chamberlin (1961). It is necessary to emend the diagnosis of the subgenus, however, by pointing out that several species include individuals that possess four eyes. In these cases, the anterior pair of eyes are large, with well-developed corneas, while the posterior pair are much smaller but still with definite corneas. In the subgenus *Kleptochthonius* the anterior and posterior eyes are large and of nearly equal size and development. The most important diagnostic characters are the larger size, the greater attenuation of the

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appendages, and the smaller number of vestitural setae in species of *Chamberlinochthonius* as compared with those of *Kleptochthonius*.

KEY TO THE SPECIES OF *Kleptochthonius* (*Chamberlinochthonius*)

1. Process on proximal end of movable finger of chela long and bifurcated (*henroti* group).....2
 - Process on proximal end of movable finger of chela long and simple (*krekeleri* group).....3
 - Process on proximal end of movable finger of chela short.....5
- 2(1). Carapace with 18 setae, six at the anterior and two at the posterior margin; chela 7.1 or more times as long as broad.....*henroti* (Vachon)
 - Carapace with 16 setae, four at anterior and two at posterior margin; chela less than 7.0 times as long as broad.....*proserpinae*, new species
- 3(1). Completely eyeless; from Wyandotte Cave, Harrison County, Indiana...
 -*packardi* (Hagen)
 - With two eyes; from caves in West Virginia and eastern Kentucky.....4
- 4(3). Carapace with 18 setae, six at anterior and two at posterior margin; palpal femur 7.2 or more times as long as broad; larger species.....
 -*krekeleri*, new species
 - Carapace with 20 setae, six at anterior and four at posterior margin; palpal femur less than 6.9 times as long as broad; smaller species.....
 -*orpheus*, new species
- 5(1). Completely eyeless; carapace bordered posteriorly by six setae (m4m); palm of chelicera with nine setae...*gertschi* Malcolm and Chamberlin
 - With eyes; carapace bordered posteriorly by two to four setae; palm of chelicera with seven setae or fewer.....6
- 6(5). With only two eyes in anterior position; no evidence of posterior eyes or eyespots.....7
 - With two corneate eyes in anterior position and two non-corneate eyespots behind.....16
 - With four corneate eyes, albeit posterior pair are smaller than anterior...17
- 7(6). Small and robust species; chela of female only 5.5 times as long as broad.....
 -*lutzi* Malcolm and Chamberlin
 - Larger and more attenuated species; chela of female more than 6.0 times as long as broad.....8
- 8(7). Only four coxal spines on each coxa I.....*rex* Malcolm and Chamberlin
 - Five or more coxal spines on each coxa I.....9
- 9(8). Movable finger of chelicera with a large tooth midway between tip of finger and distal tooth of marginal row.....10
 - Movable finger of chelicera with a smooth margin between tip and marginal row of teeth.....11
- 10(9). Tergites 1 and 2 with two marginal setae; larger species; from southern Tennessee.....
 -*barri*, new species
 - Tergites 1 and 2 with four marginal setae; smaller species; from southern Kentucky.....
 -*erebicus*, new species
- 11(9). Chela of male 8.0 or more times as long as broad; fixed finger of chela with 40 or more macrodenticles...*attenuatus* Malcolm and Chamberlin
 - Chela of male less than 8.0 times as long as broad; fixed finger of chela with fewer than 40 macrodenticles.....12

- 12(11). Homodontate chela.....*cerberus* Malcolm and Chamberlin
 Heterodontate chela.....13
- 13(12). Microdenticles of moderate size and sharp pointed.....*charon*, new species
 Microdenticles small and rounded.....14
- 14(13). Five to six coxal spines per coxa I; no discal seta present on coxa I.....
*hubrichti*, new species
 Seven to nine coxal spines per coxa I; one discal seta present on each
 coxa I.....15
- 15(14). Chelicera as long as, or longer than, carapace; leg IV with whole femur
 3.8–3.9 times as long as broad; tergite 1 with four marginal setae
*infernalis* Malcolm and Chamberlin
 Chelicera shorter than carapace; leg IV with whole femur only 3.3–3.6
 times as long as broad; tergite 1 with two marginal setae.....
*hageni* Muchmore
- 16(6). Coxal spines numbering nine to 10 on each coxa I; microdenticles on
 chelal fingers distinct and numbering 15 to 18.....
*myopius* Malcolm and Chamberlin
 Coxal spines numbering four to five on each coxa I; microdenticles of
 chelal fingers obsolescent and few in number (five to nine).....
*microphthalmus* Malcolm and Chamberlin
- 17(6). Tergite 1 with two setae and tergite 2 with two or three setae; chelicera
 much shorter than carapace.....*stygius*, new species
 Tergites 1 and 2 with four setae; chelicera as long as carapace or longer
18
- 18(17). Fixed chelal finger with 33 or fewer macrodenticles, and with micro-
 denticles distinct and sharp pointed.....*daemonius*, new species
 Fixed finger of chela with 34 or more macrodenticles, and with micro-
 denticles very small and rounded.....*pluto*, new species

Henroti GROUP

The two species included here are characterized by the possession of a long, bifurcated process on the proximal end of the movable chelal finger. The shapes of the processes in *K. (C.) henroti* and *K. (C.) proserpinae* are very similar, which certainly indicates a close relationship between the species. So far as is known at present, the group is restricted to caves in Greenbriar County, West Virginia.

Kleptochthonius (*Chamberlinochthonius*) *henroti* (Vachon)

Chamberlinochthonius henroti VACHON, 1952, p. 107. HOFF, 1958, p. 7.

This species was described from a single adult male and a tritonymph from McClung Cave, Greenbriar County, West Virginia. Study of additional specimens from this and other caves in the same area reveals the necessity for revising the diagnosis in certain particulars.

MATERIAL: Topotype male (WM 315.01001) collected by T. C. Barr, Jr., in McClung Cave on August 10, 1958; female collected August 10,

1958, by Barr in Arbuckle Cave; male collected by Barr in General Davis Cave on August 11, 1958; female collected August 14, 1958, by Barr in McFerrin Cave; three males, three females, and one tritonymph collected August 17, 1958, by Barr in Higgenbotham Caves 1 and 4; one male and one female collected August 1, 1957, in Bransford's Cave by Carl H. Krekeler; male collected August 9, 1957, by Krekeler in General Davis Cave.

DIAGNOSIS: Male: (The first figures given are for the topotype, while in parentheses are given the ranges for the other six specimens). Moderately large species similar in general facies to other members of subgenus. Carapace nearly square in dorsal outline, lateral margins a little convex; no epistome; four eyes present in topotype and in one of specimens from Higgenbotham Caves, two eyes in others; anterior eye moderately well developed in all cases, posterior eye, when present, small and only weakly corneate, but distinct; surface generally smooth, but weakly sculptured on sides; carapacial setae 19 (17-18) with six (five) on anterior margin and two (two) near posterior margin (only one specimen, from General Davis Cave, differs in having four rather than two posterior setae).

Abdomen typical; tergal chaetotaxy, 4:4:4:4:6:6:7:9:8:6:T2T:0(4:4:-4:4:4-6:6-7:6-8:6-9:6-8:6-7:T2T:0); sternal chaetotaxy,

$$\frac{3}{14}:(4-4):(4)\frac{9-9}{6}(4):(4)8(4):10:10:12:12:T9T:T2T2T2T-0\text{-mm.}$$

(approximately the same). Genital area typical. Coxal area typical; chaetotaxy, 2-2-1:0-3-0(or 1)-CS:2-2:2-3:2-3(2-2-1:0-3(or 4)-0(or 1)-CS:2-2(or 3):2-3:2-3); six spines of usual type on each coxa I (six to eight on right; five to eight on left).

Chelicera of typical facies; palm with only five setae (one specimen from Higgenbotham Caves with six setae on right and seven on left, others with five to six on each side); fixed finger with 10 to 11 (eight to 11) teeth, larger and sharper at distal end of row; movable finger with seven (six to nine) similar teeth plus an isolated tooth about midway between distal end of row and tip of finger, essentially as figured by Vachon (1952, p. 110); galea represented by a small, distinct elevation; flagellum of eight unilaterally branched setae.

Palps typical; surfaces smooth; setae long and acuminate; palpal podomeres and chaetotaxy essentially as figured by Vachon (1952, p. 108). Fixed finger of chela with 38 (35-38) widely spaced macrodenticles, mostly tall and pointed, but proximal one to three of which may be low and rounded, and with 24 (20-26) small, rounded microdenticles alter-

nating between distal macrodenticles. Movable finger with 26 (23–29) pointed macrodenticles and 12 (nine to 12) low, rounded, proximal teeth and with 19 (13–17) intervening microdenticles; proximal end of movable finger with a long, bifurcated process. Trochanter 2.0 (2.0–2.1), femur 7.2 (7.0–8.0), tibia 2.4 (2.3–2.7), chela 7.7 (7.2–7.9), and hand 2.8 (2.7–3.0) times as long as broad; movable finger 1.67 (1.64–1.71) times as long as hand.

Legs of typical proportions, with tactile setae on fourth tibia at 0.40 (0.38–0.43), metatarsus 0.22 (0.22–0.25), and telotarsus 0.34 (0.33–0.41) the length of podomere from proximal end (one specimen, from General Davis Cave, has seta on telotarsus at 0.23).

Genital area generally as figured by Vachon (1952, p. 108).

Female: (The figures given are ranges for the six available specimens). Generally similar to male. Four eyes apparent in specimen from Ar-buckle Cave and one of those from Higgenbotham's Caves, only two eyes in others; eyes of same form as those of male. Carapacial setae 17–19, with six (five in one) on anterior margin and two near posterior margin. Chaetotaxy of abdominal tergites, 3–4:3–4:4–5:4–6;5–7;7–9:7–9:6–8:-T2T:0; sternal chaetotaxy,

$$\frac{2-3}{5-7}:(4)6-7(4):(3-4)7-8(3-4):8-11:7-10:10-12:10-12;T9-10T:T2T2T2T:0:\text{mm.}$$

Genital area typical. Chaetotaxy of coxae, 2–2–1:0–3–0–CS:2–2:2–3:2–3; five to seven spines on each coxa I.

Cheliceral palms of one specimen from Higgenbotham Caves with seven setae on right and six on left, others with five to six on each side; teeth of fingers, galeal elevation, and other features essentially like those of male.

Palps similar to those of males but slightly stouter. Fixed finger with 34–39 macrodenticles and 19–24 microdenticles; movable finger with 21–28 sharp macrodenticles, 10–12 rounded proximal teeth, and 13–16 microdenticles; process at proximal end of movable finger like that in male. Trochanter 1.9–2.0, femur 6.8–7.6, tibia 2.4–2.6, chela 7.2–7.6, and hand 2.7–2.8 times as long as broad; movable finger 1.60–1.70 times as long as hand.

Legs like those of male but slightly stouter.

MEASUREMENTS (IN MM.): Male: Body length, 2.72 (2.17–2.30); carapace length, 0.67 (0.60–0.68); greatest width, 0.67 (0.52–0.68). Chelicera 0.64 (0.57–0.62) long by 0.28 (0.25–0.26) broad, movable finger 0.31 (0.26–0.31). Palpal trochanter 0.37 (0.33–0.34) long by 0.18 (0.16–0.18) broad; femur, 1.20 (1.07–1.16) by 0.17 (0.15–0.16); tibia, 0.45 (0.39–

0.43) by 0.18 (0.16–0.18); chela, 1.74 (1.56–1.64) by 0.23 (0.20–0.22); hand, 0.66 (0.58–0.63) by 0.23 (0.20–0.22); movable finger, 1.09 (0.99–1.03) long; proximal process of movable finger about 0.070 (0.056–0.065) long. Leg I: basifemur 0.77 (0.68–0.75) long by 0.10 (0.10) broad; telofemur, 0.31 (0.29–0.31) by 0.09 (0.08–0.09); tibia, 0.39 (0.36–0.38) by 0.07 (0.06–0.07); tarsus, 0.89 (0.70–0.74) by 0.07 (0.05–0.07). Leg IV: entire femur 1.06 (0.93–1.02) long; basifemur 0.40 (0.34–0.38) long by 0.29 (0.26) broad; telofemur, 0.77 (0.68–0.74) by 0.25 (0.23–0.26); tibia, 0.71 (0.64–0.69) by 0.11 (0.11–0.12); metatarsus, 0.37 (0.30–0.36) by 0.10 (0.08–0.09); telotarsus, 0.91 (0.78–0.86) by 0.07 (0.06–0.07).

Female: Body length, 1.76–2.60; carapace length, 0.64–0.68; greatest width, 0.63–0.71; chelicera 0.57–0.65 long by 0.26–0.30 broad, movable finger, 0.29–0.33. Palpal trochanter 0.31–0.37 long by 0.16–0.18 broad; femur, 1.08–1.18 by 0.15–0.17; tibia, 0.39–0.44 by 0.16–0.18; chela, 1.57–1.71 by 0.22–0.23; hand, 0.60–0.65 by 0.22–0.24; movable finger, 0.99–1.09 long; proximal process of movable finger about 0.055–0.068 long. Leg I: basifemur, 0.69–0.77 by 0.09–0.10; telofemur, 0.27–0.31 by 0.09; tibia, 0.32–0.39 by 0.07; tarsus, 0.72–0.77 by 0.07. Leg IV: entire femur 0.93–1.04 long; basifemur, 0.35–0.39 by 0.23–0.28; telofemur, 0.66–0.75 by 0.22–0.26; tibia, 0.64–0.70 by 0.11–0.12; metatarsus, 0.33–0.37 by 0.09–0.10; telotarsus, 0.77–0.88 by 0.06–0.07.

Kleptochthonius (Chamberlinochthonius) proserpinae, new species

MATERIAL: Holotype female (WM 260.01001) collected August 10, 1957, in Pollock Cave, Greenbriar County, West Virginia, by Carl H. Krekeler.

DIAGNOSIS: Female: Moderately large species, similar in facies to other members of subgenus. Carapace a little longer than broad, lateral margins a little convex; no epistome; two eyes present in anterior position, with well-developed corneas; no trace of posterior eyes or eyespots; surface generally smooth, but finely sculptured on the sides; carapacial setae 16 (4-2).

Abdomen typical; tergal chaetotaxy, 4:4:4:4:5:5:6:6:6:5:4:0; sternal chaetotaxy, 8:(4)5(4):(4)7(4):9:8:8:10:9:8:0:mm. Genital area typical. Coxal area typical, chaetotaxy, 2–2–1:0–3–0–CS:2–2(3):2–3:2–3; six spines of the usual type on each coxa I.

Chelicera of usual facies; palm with seven setae; fixed finger with about 10 teeth, becoming smaller at proximal end of row; movable finger with a row of about eight teeth and an isolated tooth somewhat distal to end of row; galea represented by a small elevation; flagellum of eight unilaterally branched setae.

Palps long and slender; surfaces smooth; setae long and acuminate; proportions of podomeres and tactile setae of chela as in other species of subgenus. Fixed finger of chela with 31 widely spaced, acutely pointed macrodenticles and 21 smaller, bluntly pointed microdenticles alternating (cf. fig. 3). Movable finger with 20 well-spaced macrodenticles, with 14 intervening, rounded microdenticles and 10 low, rounded, contiguous teeth at proximal end of row; proximal end of movable finger with a long, bifurcated process, similar to that seen in *K. (C.) henroti*. Trochanter 2.0, femur 7.2, tibia 2.4, chela 6.9, and hand 2.6 times as long as broad; movable finger 1.66 times as long as hand.

Legs of typical facies. Fourth leg with tactile setae on tibia 0.41, on metatarsus 0.24, and on telotarsus 0.30 the length of segment from proximal end.

MEASUREMENTS (IN MM.): Body length, 1.81; carapace 0.68 long; greatest width, 0.64; abdomen 0.69 broad; chelicera 0.62 long (breadth not determinable). Palpal trochanter 0.33 long by 0.17 broad; femur, 1.10 by 0.15; tibia, 0.41 by 0.17; chela, 1.60 by 0.23; hand, 0.61 by 0.23; movable finger 1.01 long; proximal process of movable finger about 0.065 long. Leg I: basifemur 0.67 long by 0.12; telofemur undeterminable; tibia 0.36 by 0.07; tarsus 0.69 by 0.06. Leg IV: entire femur 0.94 long; basifemur, 0.34 by 0.28; telofemur, 0.67 by 0.25; tibia, 0.65 by 0.11; metatarsus 0.34 by 0.09; telotarsus, 0.76 by 0.06.

REMARKS: Though all the other Greenbriar County specimens have been assigned to *K. henroti*, this specimen appears sufficiently different to be described as a distinct species. It differs from *K. henroti* in the following respects: it has only 16 (4-2) carapacial setae rather than 18 (6-2); seven setae on the cheliceral palm rather than five or six; the chela has a length/breadth ratio of 6.85 rather than 7.15 or greater.

Krekeleri GROUP

The species of this group are characterized by the possession of a long, straight, and simple process on the proximal end of the movable chelal finger. In *K. (C.) krekeri* and *K. (C.) orpheus* the processes are very similar and certainly indicate a close relationship of these two species from eastern Kentucky and southern West Virginia. The process in *K. (C.) packardii*, though relatively longer and slimmer, is of the same general shape and probably indicates a relationship to the other two species. The species of the group are seen to occupy the northern tier of caves from Indiana to West Virginia, exclusive of those caves in Greenbriar County, West Virginia.

Kleptochthonius (Chamberlinochthonius) krekeleri, new species

MATERIAL: Holotype male (WM 263.01003), paratype male, and allotype female collected June 22, 1957, in Yarberry's Cave 1, 1½ miles north-northeast of Columbia, Adair County, Kentucky, by Carl Krekeler. One male taken July 1, 1957, in Betsy Cave, 4 miles south-southeast of Bowen, Powell County, Kentucky, by Krekeler. Two females from Great Saltpeter Cave, 8 miles north of Livingston, Rockcastle County, Kentucky, one by Krekeler on June 25, 1957, and one by T. C. Barr, Jr., on January 14, 1962.

DIAGNOSIS: Male: (The first figures given are those for the holotype, followed in parentheses by those for the two paratypes). A moderately large species, similar in general facies to other members of subgenus. Carapace about as long as broad, lateral margins convex; no epistome; two eyes present in anterior position; no posterior eyes or eyespots discernible; surface generally smooth but with fine reticulations on sides. Carapacial setae 18 (6-2). Coxal area typical; chaetotaxy, 2-2-1:0-3-0(1)-CS:2-2:2-3:2-3. Six spines of the usual type on each coxa I.

Abdomen typical. Tergal chaetotaxy of holotype not determinable; of paratypes, 4:4:4:4-4-6:6:6:6:6:4:4:0. Sternal chaetotaxy,

$$\frac{3}{13}:(4-4):\frac{10-10}{(4)6(4)}:(3)7(3):8:?$$

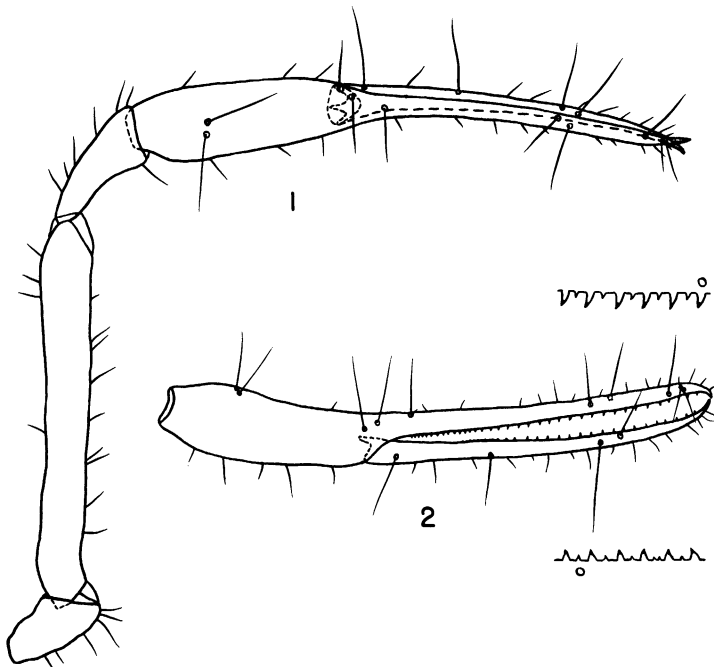
(Posterior sternites of paratypes with six to eight setae.) Genital area typical.

Chelicera of usual facies; palm with seven setae; fixed finger with 10-11 irregular teeth; movable finger with a row of six similar teeth and with a small isolated tooth between end of row and tip of finger; galea represented by a small ridge; flagellum of eight unilaterally branched setae.

Palps generally typical; proportions of podomeres as shown in figure 1; tactile setae of chela as shown in figure 2. Fixed finger of chela with a marginal row of 34 (31) widely spaced, sharp-pointed macrodenticles and 24 (24-26) smaller, sharp-pointed microdenticles intervening (cf. fig. 2). In two of the intervals between macrodenticles in the holotype there are two microdenticles rather than one; the same situation occurs once in one of the paratypes and three times in the other. Movable finger with 20 (21-23) macrodenticles, 17 (15-19) alternating microdenticles, and 11 (10-11) low, rounded, contiguous teeth at proximal end of row; proximal end of movable finger with a moderately long process extending from its dorsal edge. Trochanter 2.0 (2.0), femur 7.6 (7.4-

8.0), tibia 2.6 (2.5–2.6), chela 7.7 (7.1–7.7), hand 2.9 (2.7) times as long as broad; movable finger 1.64 (1.64) times as long as hand.

Legs of typical facies. Fourth leg with tactile setae on tibia 0.39 (0.36–0.44), on metatarsus 0.18 (0.16–0.23), and on telotarsus 0.10 (0.18–0.20) length of segment from proximal end.



FIGS. 1, 2. *Kleptochthonius* (*Chamberlinochthonius*) *kekeleri*, new species, holotype male. 1. Dorsal aspect of left palp. 2. Lateral aspect of right chela.

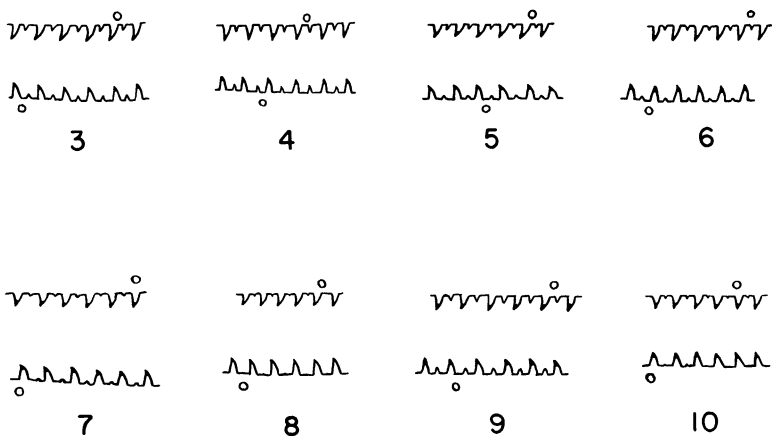
FEMALE: (The first figures given are those for the allotype, while in some cases in parentheses are given ranges for the two paratypes.) Generally similar to male, but slightly larger. Two eyes present in each specimen. Carapacial setae, 18 (6–2). Coxal chaetotaxy, 2–2–1;0–3–0(1)–CS;2–2;2–3(2);2–3. Five (six to seven) spines on each coxa I. Chaetotaxy of abdominal tergites, 4:4:4:4:4–5:4–6:6:6:6:4:4:0; sternal chaetotaxy,

$$\frac{3}{6};(3)7(3):(3-4)7(3-4):8:7-8:8-9:8-9:8-10:7:0:\text{mm.}$$

Genital area typical.

Chelicera similar to that of male but with galeal prominence more distinct.

Palps like those of male. Fixed finger of allotype with 30 macrodenticles and 31 microdenticles of which 16 occur as pairs. In paratypes there are 28–30 macrodenticles and 23 microdenticles, of which four occur as pairs in one specimen. Movable finger with 21 (17–18) macrodenticles, 19 (15–16) microdenticles (including two pairs in allotype) and nine



FIGS. 3–10. Denticles of chelal fingers of *Kleptochthonius* (*Chamberlinochthonius*) spp. In each set the upper figure represents the fixed finger, the areole being that of tactile seta *et*, while the lower figure represents the movable finger, the areole being that of tactile seta *t*. The tips of the fingers in each figure are oriented toward the right. 3. *K. (C.) proserpinae*, new species, holotype female. 4. *K. (C.) orpheus*, new species, holotype male. 5. *K. (C.) erebicus*, new species, holotype male. 6. *K. (C.) charon*, new species, holotype male. 7. *K. (C.) hubrichti*, new species, holotype female. 8. *K. (C.) stygius*, new species, holotype male. 9. *K. (C.) daemonius*, new species, holotype male, 10 *K. (C.) pluto*, new species, holotype male.

(14–13) rounded, contiguous, basal teeth. Trochanter 2.1 (2.2), femur 7.5 (7.5–7.9), tibia 2.4 (2.4–2.5), chela 7.7 (7.4–7.5), hand 2.9 (2.8–2.9) times as long as broad; movable finger 1.66 (1.65) times as long as hand.

Fourth leg with tactile setae on tibia 0.39 (0.40), on metatarsus 0.17 (0.22–0.23), and on telotarsus 0.08 (0.17–0.18) length of segment from proximal end.

MEASUREMENTS (IN MM.): Male: Body length undeterminable in holotype (1.75–2.12); carapace 0.64 (0.58–0.66) long, greatest width 0.66 (0.59–0.67); abdomen, 0.65 wide. Chelicera 0.61 (0.55–0.58) long by 0.28 (0.25–0.27), movable finger 0.29 (0.29–0.31) long. Palpal trochanter,

0.35 (0.35) by 0.18 (0.18); femur, 1.22 (1.08–1.22) by 0.16 (0.15); tibia, 0.47 (0.39–0.46) by 0.18 (0.15–0.18); chela, 1.79 (1.51–1.79) by 0.23 (0.21–0.23); hand, 0.69 (0.60–0.64) by 0.24 (0.22–0.23); movable finger, 1.14 (0.93–1.14) long and with proximal process 0.038 (0.037–0.042) long. Leg I: basifemur, 0.70 (0.61–0.72) by 0.10 (0.10); telofemur, 0.31 (0.27–0.29) by 0.10 (0.08–0.09); tibia, 0.36 (0.32–0.37) by 0.07 (0.07); tarsus, 0.80 (0.67–0.77) by 0.07 (0.06–0.07). Leg IV: entire femur 1.01 (0.88–1.04) long; basifemur, 0.37 (0.33–0.37) by 0.28 (0.24–0.29); telofemur, 0.76 (0.64–0.76) by 0.25 (0.23–0.26); tibia, 0.71 (0.59–0.69) by 0.12 (0.11–0.12); metatarsus, 0.37 (0.32–0.36) by 0.10 (0.09–0.10); telotarsus, 0.88 (0.75–0.86) by 0.07 (0.06–0.07).

FEMALE: Body length, 2.35 (2.20–2.60); carapace, 0.71 (0.70–0.73) long, greatest width 0.69 (0.66). Abdomen, 0.69 (0.77–0.91) wide. Chelicera, 0.61 (0.66–0.70) long by 0.29 (0.29–0.31), movable finger, 0.32 (0.31–0.35) long. Palpal trochanter, 0.37 (0.39) by 0.18 (0.18); femur, 1.26 (1.26–1.33) by 0.17 (0.17); tibia, 0.47 (0.46–0.48); chela, 1.85 (1.87–1.94) by 0.24 (0.25–0.26); hand, 0.69 (0.71–0.73) by 0.24 (0.25–0.26); movable finger, 1.15 (1.17–1.21) and with proximal process 0.043 (0.037–0.043) long. Leg I: basifemur, 0.74 (0.72–0.75) by 0.10 (0.11); telofemur, 0.32 (0.34) by 0.10 (0.09–0.10); tibia, 0.39 (0.37–0.38) by 0.07 (0.07–0.08); tarsus, 0.78 (0.81–0.83) by 0.07 (0.07). Leg IV: entire femur, 1.01 (1.04–1.09) long; basifemur, 0.30 (0.37–0.41) by 0.28 (0.29–0.30); telofemur, 0.76 (0.77–0.80) by 0.25 (0.26–0.27); tibia, 0.71 (0.73–0.75) by 0.12 (0.12); metatarsus, 0.38 (0.37–0.42) by 0.10 (0.09–0.10); telotarsus, 0.92 (0.88–0.93) by 0.07 (0.07).

REMARKS: This species is named for Carl H. Krekeler, who collected the first known specimens.

Kleptochthonius (Chamberlinochthonius) orpheus, new species

MATERIAL: Holotype male (WM 317.01001) collected August 8, 1958, by T. C. Barr, Jr., in Patton's Cave, Monroe County, West Virginia.

DIAGNOSIS: Relatively small species, but similar in general facies to other members of subgenus. Carapace a little longer than broad, lateral margins slightly convex; no epistome; two eyes present in anterior position, with well-developed corneas; no posterior eyes or eyespots; surface generally smooth, but finely reticulated on lower sides; carapacial setae 20 (6–4).

Abdomen typical; tergal chaetotaxy, 4:4:4:4:6:6:6:6:7:7:5:0: sternal chaetotaxy,

$$\frac{3}{8}:(4-5):(4)\frac{12-14}{7}(3):(3)7(3):8:8:8:9:9:7:0:\text{mm.}$$

Genital area typical. Coxal area typical, chaetotaxy, 2-2-1:0-3-0-CS: 2-2:2-2:2-4(2); three spines of usual type on right coxa I and four on left.

Chelicera of typical facies; palm with seven setae; fixed finger with eight to nine teeth, movable finger with a row of nine to 10 teeth and an isolated tooth somewhat distal to end of row; galea represented by a very low ridge; flagellum of eight unilaterally branched setae.

Palps generally typical; surfaces smooth; setae long and acuminate; proportions of podomeres and tactile setae of chela generally as in other species of subgenus. Fixed finger of chela with a row of 29 widely spaced, tall, sharp macrodenticles and two smaller, rounded teeth at proximal end of row, and with 14 relatively long, sharply pointed microdenticles alternating with distal macrodenticles (cf. fig. 4). Movable finger with 15 spaced macrodenticles alternating with 15 pointed microdenticles, and 10 low, rounded, contiguous teeth at proximal end of row; proximal end of movable finger with a cylindrical process extending from its dorsal edge, similar to that seen in *K. (C.) krekeleeri* but not so long. Trochanter 1.6, femur 6.7, tibia 2.3, chela 7.3, and hand 2.8 times as long as broad; movable finger 1.64 times as long as hand.

Legs of typical facies. Fourth leg with tactile setae on tibia 0.41, on metatarsus 0.24, and on telotarsus 0.27 length of segment from proximal end.

MEASUREMENTS (IN MM.): Body length, 2.12; carapace, 0.55 long, greatest width, 0.52; abdomen, 0.73 broad. Chelicera, 0.53 long by 0.24 broad and with movable finger 0.28 long. Palpal trochanter, 0.28 long by 0.18 broad; femur, 0.94 by 0.14; tibia, 0.34 by 0.15; chela, 1.39 by 0.19; hand, 0.53 by 0.19; movable finger, 0.86 long and with proximal process about 0.030 long. Leg I: basifemur, 0.52 long by 0.08 broad; telofemur, 0.21 by 0.07; tibia, 0.29 by 0.06; tarsus, 0.55 by 0.055. Leg IV: entire femur 0.75 long; basifemur, 0.29 by 0.22; telofemur, 0.56 by 0.21; tibia, 0.51 by 0.10; metatarsus, 0.28 by 0.07; telotarsus, 0.59 by 0.05.

REMARKS: This species is distinct from all others of the subgenus, but bears some resemblance to *K. (C.) krekeleeri* in the possession of a moderate-sized, cylindrical process at the base of the movable chelal finger. This process is quite different in shape and size from that of the Greenbriar County forms, from which this species is separated geographically by only a short distance.

The other known species of *Kleptochthonius* all have processes on the movable chelal fingers which are relatively short and more or less bifurcated. It does not yet appear feasible to group these species on the basis of this or other characters. Larger series of specimens will probably be

necessary before an analysis of the relationships among the species of central Kentucky, western Virginia, and eastern Tennessee can be made.

Kleptochthonius (Chamberlinochthonius) barri, new species

MATERIAL: Holotype male (WM 328.01001) collected June 14, 1958, in Tom Campbell Cave, 5 miles southeast of Viola, Grundy County, Tennessee; paratype male taken June 15, 1958, in Hobbs Cave, 11 miles south of McMinnville, Warren County, Tennessee; the allotype (WM 322.01001) and a paratype female taken on June 8, 1958, in Boyd Hollow Cave, about 2 miles east of Tom Campbell Cave, Grundy County, Tennessee.

DIAGNOSIS: Male: (The first figures given are for the holotype, those in parentheses for the paratype). A relatively large species with two eyes, similar in general facies to other species of subgenus. Carapace a little longer than broad; no epistome; two well-developed eyes in the anterior position; no posterior eyes or eyespots; surface generally smooth except for fine reticulations on sides. Carapacial setae 20 (6-4). Coxal area typical; chaetotaxy, 2-2-1:0-3-1-CS:2-3:2-3:2-3;7-9(6-8); spines of usual type on each coxa I.

Abdomen typical. Tergal chaetotaxy 2:2:4:3:6:6:7:9:9:8:4:0 (2:2:4:-4:4:5:6:7:8:7:4:0). Sternal chaetotaxy,

$$\frac{2}{8}:(4-4):\frac{10-11}{(3)8(3)}:10:11:11:13:11:10:0:\text{mm.}$$

Genital area typical.

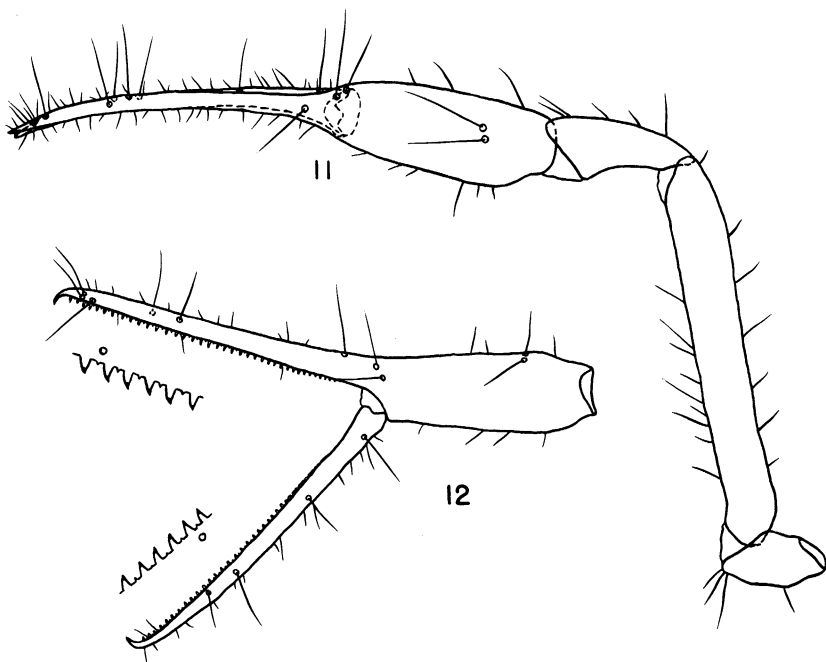
Chelicera of usual facies; palm with seven setae; movable finger with a row of nine to 11 irregular teeth and a conspicuous isolated tooth midway between end of row and tip of finger; fixed finger with 13-15 similar teeth; galea reduced to a long, low ridge; flagellum of eight unilaterally branched setae.

Palps typical; surfaces smooth; setae long and acuminate; proportions of podomeres shown in figure 11; tactile setae of chela as shown in figure 12. Fixed finger of chela with a row of 41 large, sharp, spaced macrodenticles and about 17 small, rounded microdenticles alternating at distal end (cf. fig. 12). Movable finger with 27 similar macrodenticles alternating distally with about 13 microdenticles and with 10 low, rounded, contiguous teeth at proximal end of row; proximal end of movable finger with a very broad elevation on dorsal edge. Trochanter 1.9 (1.9), femur 6.8 (6.6), tibia 2.3 (2.3), chela 6.6 (6.6), and hand 2.5 (2.4) times as long as broad; movable finger 1.65 (1.64) times as long as hand.

Legs typical. Fourth leg with tactile setae on tibia 0.36 (0.37), on meta-

tarsus 0.21 (0.21), and on telotarsus 0.29 (0.22) length of segment from proximal end.

Female: Similar to male but larger and stouter. Eyes like those in male. Carapacial setae 20 (6-4). Coxal chaetotaxy, 2-2-1:0-3-1-CS:2-2:2-3:2-3. Coxal spines seven to eight.



FIGS. 11, 12. *Kleptochthonius* (*Chamberlinochthonius*) *barri*, new species, holotype male. 11. Dorsal aspect of right palp. 12. Lateral aspect of left chela.

Chaetotaxy of abdominal tergites, 2:2:4:4:6:6:9:8:7:5:4:0. Sternal chaetotaxy,

$$\frac{3}{5}:(3)7(3):(4)12(4):13:13:11:13:12:12:0:\text{mm.}$$

Genital area typical.

Chelicera like that of male except that galeal ridge is a little more prominent.

Palps like those of male. Fixed finger with 42-43 macrodenticles and 19-20 microdenticles. Movable finger with 27-28 macrodenticles, eight to 15 microdenticles, and 10-12 rounded, basal teeth. Trochanter 1.9-

2.0, femur 6.4–6.8, tibia 2.2–2.4, chela 6.2–6.4, and hand 2.3–2.4 times as long as broad; movable finger 1.58–1.59 times as long as hand.

Fourth leg with tactile setae on tibia 0.40–0.42, on metatarsus 0.21–0.22, and on telotarsus 0.26–0.27 length of segment from proximal end.

MEASUREMENTS (IN MM.): Male: Body length, 2.50 (2.37); carapace 0.67 (0.62) long, greatest width, 0.64 (0.56); abdomen 1.0 (0.91) wide. Chelicera 0.65 (0.59) long by 0.29 (0.27) wide, movable finger 0.34 (0.31) long. Palpal trochanter 0.35 (0.34) long by 0.18 (0.18) wide; femur, 1.24 (1.16) by 0.18 (0.18); tibia, 0.47 (0.44) by 0.20 (0.19); chela, 1.77 (1.69) by 0.27 (0.26); hand, 0.67 (0.64) by 0.27 (0.27); movable finger 1.11 (1.04) long and with proximal process 0.022 (0.019) long. Leg I: basifemur, 0.74 (0.69) by 0.10 (0.10); telofemur, 0.31 (0.28) by 0.09 (0.09); tibia, 0.38 (0.36) by 0.07 (0.07); tarsus, 0.73 (0.72) by 0.07 (0.07). Leg IV: entire femur 1.04 (0.99) long; basifemur, 0.37 (0.37) by 0.24 (0.23); telofemur, 0.75 (0.71) by 0.20 (0.21); tibia, 0.66 (0.64) by 0.11 (0.11); metatarsus, 0.35 (0.34) by 0.09 (0.09); telotarsus, 0.84 (0.82) by 0.07 (0.06).

Female: Body length, 2.33–2.58; carapace 0.75–0.76 long, greatest width, 0.69–0.72; abdomen 0.95–1.06 wide. Chelicera 0.69–0.72 long by 0.33 broad, movable finger 0.34–0.37 long. Palpal trochanter 0.39–0.40 by 0.20 wide; femur, 1.31–1.38 by 0.20; tibia, 0.50–0.53 by 0.22–0.23; chela, 1.89–1.96 by 0.31; hand, 0.73–0.75 by 0.31–0.32; movable finger, 1.16–1.19 long. Leg I: basifemur, 0.78–0.84 by 0.10–0.11; telofemur, 0.31–0.32 by 0.10; tibia, 0.40–0.42 by 0.08; tarsus, 0.78–0.82 by 0.07. Leg IV: entire femur 1.07–1.15 long; basifemur, 0.41–0.43 by 0.26–0.29; telofemur, 0.75–0.80 by 0.23–0.26; tibia, 0.72–0.75 by 0.12; metatarsus, 0.38–0.42 by 0.10; telotarsus, 0.87–0.88 by 0.07.

REMARKS: This handsome species is named for Thomas C. Barr, Jr., who has, by his extensive collection and study of cavernicolous animals, been foremost in the extension of our knowledge of subterranean life.

Kleptochthonius (Chamberlinochthonius) erebicus, new species

MATERIAL: Holotype male (WM 334.01001) collected October 3, 1959, by T. C. Barr, Jr., in Hog Cave, about 2 miles northeast of Mill Springs, Wayne County, Kentucky.

DIAGNOSIS: A moderately large species, similar in general facies to other members of subgenus. Carapace definitely longer than broad, lateral margins a little convex; no epistome; two eyes present in anterior position, with well-developed corneas; no posterior eyes or eyespots; surface generally smooth; carapacial setae 19 (6-4). Coxal area typical; chaetotaxy, 2-2-1:0-3(2)-0(1)-CS:2-3:2-3:2-3; seven spines of usual type

on each coxa I.

Abdomen typical; tergal chaetotaxy, 4:4:4:4:6:6:7:8:8:7:5:0; sternal chaetotaxy,

$$\frac{3}{9}(4-4):\frac{10-11}{(3)8(3)}:(3)7(4):12:11:12:11:12:9:0:\text{mm.}$$

Genital area typical

Chelicera of typical facies but small in relation to size of carapace; palm with seven setae; fixed finger with a row of eight to 10 irregular teeth; movable finger with a row of six to seven similar teeth, plus an isolated tooth midway between end of row and tip of finger; galea represented by a long, low ridge; flagellum of eight unilaterally branched setae.

Palps generally typical in size and proportions; proportions of podomeres and tactile setae of chela generally as in other species of subgenus. Fixed finger of chela with a row of 33 widely spaced, long, sharp macrodenticles and 17 small, but sharp-pointed microdenticles alternating (cf. fig. 5). Movable finger with 18 macrodenticles and 15 alternating microdenticles and 12 low, rounded, contiguous teeth at proximal end of row; proximal end of movable finger with a small, bilobed process extending from its dorsal edge. Trochanter 1.8, femur 6.4, tibia 2.4, chela 6.7, and hand 2.5 times as long as broad; movable finger 1.59 times as long as hand.

Legs of typical facies. Fourth leg with tactile setae on tibia 0.36, on metatarsus 0.21, and on telotarsus 0.24 length of segment from proximal end.

MEASUREMENTS (IN MM.): Body length, 2.33; carapace 0.61 long, greatest width, 0.50; abdomen 0.84 broad. Chelicera, 0.48 long by 0.23 broad and with movable finger 0.25 long. Palpal trochanter 0.29 long by 0.16 broad; femur, 1.03 by 0.16; tibia, 0.40 by 0.17; chela, 1.46 by 0.22; hand, 0.57 by 0.23; movable finger 0.91 long and with proximal process about 0.022 long. Leg I: basifemur 0.62 long by 0.09 broad; telofemur, 0.25 by 0.09; tibia, 0.31 by 0.07; tarsus, 0.64 by 0.06. Leg IV: entire femur 0.90 long; basifemur, 0.36 by 0.26; telofemur, 0.64 by 0.23; tibia, 0.61 by 0.11; metatarsus, 0.31 by 0.09; telotarsus, 0.75 by 0.06.

REMARKS: Although only a single male specimen is available, it is sufficiently distinct to be regarded as representative of a new species.

Kleptochthonius (Chamberlinochthonius) charon, new species

MATERIAL: Holotype male (WM 372.01002), allotype (WM 372.-01001), and one paratype female and a deutonymph collected April 2, 1960, in Lowe Gap Cave, 2 miles east of Litton, Bledsoe County, Tennessee, by T. C. Barr, Jr. One paratype female taken by Barr on the

same date in Aaron Tollett Cave, 1.2 miles north of Litton.

DIAGNOSIS: Male: A moderately large species with two eyes, similar in general facies to other members of subgenus. Carapace about as long as broad, sides a little convex; no epistome; two eyes, with well-developed corneas present in anterior position; no posterior eyes or eyespots; surface generally smooth except for fine reticulations on sides. Carapacial setae 18 (6-2). Coxal area typical; chaetotaxy, 2-2-1:0-3-1-CS:-2-3(2):2-3:2-3. Six to eight coxal spines on each coxa I.

Abdomen typical. Tergal chaetotaxy, 4:4:4:4:5:5:7:7:7:5:0. Sternal chaetotaxy,

$$\frac{2}{12}:(4-4):\frac{10-11}{(4)6(4)}:(4)8(4):9:9:10:12:12:11:0:\text{mm.}$$

Genital area typical.

Chelicera generally typical; palm with seven setae; fixed finger with 10-11 irregular teeth; movable finger with a row of six such teeth and no accessory tooth but a roughened area midway between distal end of row and tip of finger. Galea represented by a low but distinct elevation. Flagellum of eight unilaterally branched setae; serrula exterior of 19-20 blades.

Palps generally typical; proportions of podomeres and tactile setae of chela generally as in other species of subgenus. Fixed finger of chela with 38 large, sharp, spaced macrodenticles and 18 small, pointed microdenticles alternating at distal end (cf. fig. 6). Movable finger with 25 macrodenticles, alternating distally with 16 microdenticles and with 11 low, rounded, contiguous teeth proximally. Proximal end of movable finger with a bifurcated process of medium length on its dorsal edge. Trochanter 2.1, femur 6.9, tibia 2.3, chela 6.7, and hand 2.7 times as long as broad; movable finger 1.57 times as long as hand.

Leg typical. Fourth leg with tactile setae on tibia 0.37, on metatarsus 0.27, and on telotarsus 0.38 length of segment from proximal end.

Female: Similar to male but a little larger. (Figures are first given for the allotype, in some cases with those for the paratypes following in parentheses.) Eyes like those of male. Carapacial setae variable, being 21 (6-4) on allotype and 18 (5-3) and 20 (4-5) in paratypes. Coxal chaetotaxy, 2-2-1:0-3-0-CS:2-3(2):2-3:2-3. Coxal spines six to seven (seven to nine).

Chaetotaxy of abdominal tergites, 4:4:4:4:6:5:7:7:8:7:4:0(2-4:2-4:4:-4:4-5:5-7:8:9:9-10:7:4:0). Sternal chaetotaxy,

$$\frac{2}{5}:(3)6(3):(4)7(4):8:10:12:13:12:11:0:\text{mm.}$$

(Of paratypes similar.) Genital area typical.

Chelicera similar to that of male in all respects.

Palps like those of male, but with chela a little stouter. Fixed finger with 39 (32–37) macrodenticles and 15 (17–18) microdenticles. Movable finger with 22 (21–23) macrodenticles, 15 (15–16) microdenticles alternating distally and 14 (11) rounded, contiguous, basal teeth. Trochanter 2.0 (1.9–2.0), femur 7.0 (7.2), tibia 2.4 (2.4), chela 6.4 (6.2–6.3), and hand 2.5 (2.5–2.6) times as long as broad; movable finger 1.53 (1.50–1.55) times as long as hand.

Legs like those of male. Fourth leg with tactile setae on tibia 0.40 (0.39), on metatarsus 0.26 (0.25–0.28), and on telotarsus 0.39 (0.32–0.40) length of segment from proximal end.

Deutonymph: Similar to adults but much smaller and less attenuated. Two eyes as in adult; carapacial setae 18 (6–2); coxal chaetotaxy 2–2–1:0–2–0–CS:2–1:1–2:1–2; two coxal spines on each coxa I.

Chaetotaxy of abdominal tergites 4:4:4:4:4:4:6:6:6:4:4:0. Sternites with about four setae.

Cheliceral palm with five setae; teeth of fingers like those of adult but fewer; galea represented by a small, distinct bump; flagellum of six setae; serrula exterior of 14 blades.

Palps more robust than those of adult: trochanter 1.6, femur 5.6, tibia 1.7, chela 5.4, and hand 2.2 times as long as broad; movable finger 1.46 times as long as hand. Fixed finger with 23 macrodenticles and six very small microdenticles alternating at distal end; movable finger with 13 macrodenticles, eight low, rounded, proximal teeth and about three tiny microdenticles. Six tactile setae on fixed finger (*isb* and *eb* apparently missing) and two on movable finger (probably *st* and *sb*).

Legs less attenuated than those of adult. Fourth leg with tactile setae on tibia 0.39, on metatarsus 0.30, and on telotarsus 0.26 length of segment from proximal end.

MEASUREMENTS (IN MM.): Male holotype: Body length, 2.28; carapace 0.64 long; greatest width, 0.64; abdomen, 0.84 wide. Chelicera 0.56 long by 0.26 broad, movable finger 0.26 long. Palpal trochanter, 0.33 by 0.16; femur, 1.10 by 0.16; tibia, 0.41 by 0.18; chela, 1.61 by 0.25; hand, 0.64 by 0.25; movable finger 1.01 long; proximal process of movable finger 0.036 long. Leg I: basifemur, 0.65 by 0.09; telofemur, 0.29 by 0.09; tibia, 0.33 by 0.07; tarsus, 0.69 by 0.07. Leg IV: entire femur, 0.95; basifemur, 0.37 by 0.24; telofemur, 0.67 by 0.22; tibia, 0.63 by 0.11; metatarsus, 0.33 by 0.08; telotarsus, 0.80 by 0.06.

Female: (Figures for allotype given first, followed in parentheses by those for paratypes). Body length, 2.67 (1.98–2.79); carapace 0.69 (0.64–

0.71) long; abdominal width, 0.80 (0.80–0.88). Chelicera 0.64 (0.59–0.63) long by 0.29 (0.28–0.30) broad; movable finger, 0.30 (0.29–0.32). Palpal trochanter 0.37 (0.34–0.37) long by 0.18 (0.18) broad; femur, 1.23 (1.16–1.31) by 0.18 (0.16–0.18); tibia, 0.46 (0.42–0.48) by 0.19 (0.18–0.20); chela, 1.80 (1.59–1.74) by 0.28 (0.26–0.28); hand, 0.69 (0.65–0.71) by 0.28 (0.26–0.28); movable finger, 1.06 (0.97–1.09); proximal process of movable finger, 0.037 (0.038 by 0.042).

Deutonymph: Body length, 1.28; carapace 0.40 long. Chelicera 0.35 long by 0.17 broad; movable finger, 0.18 long. Palpal trochanter, 0.19 by 0.12; femur, 0.61 by 0.11; tibia, 0.21 by 0.12; chela, 0.91 by 0.17; hand, 0.37 by 0.17; movable finger 0.53 long.

Kleptochthonius (Chamberlinochthonius) hubrichti, new species

MATERIAL: Holotype female (WM 302.01001) collected in Duval Salt peter Cave, 0.7 mile northwest of Becton, Barren County, Kentucky, on February 10, 1957, by Leslie Hubricht. Paratype female taken in Tar Barrel Cave (= Becton Cave), 8 miles west-southwest of Glasgow, Barren County, Kentucky, on June 19, 1957, by Carl Krekeler.

DESCRIPTION: Female: (The first figures given are for the holotype, followed in some cases in parentheses by those for the paratype). A moderately large, two-eyed species similar in general facies to other members of subgenus. Carapace slightly longer than broad, lateral margins a little convex and distinctly narrowed posteriorly; no epistome; two corneate eyes in anterior position; no eyes or eyespots behind; surface smooth except for fine reticulations on sides. Carapacial setae 21 (20), with seven (six) at anterior margin and four (four) near posterior border. Coxal area typical; chaetotaxy, 2–2–1:1–2–0–CS:2–2:2–3:2–3; five or six spines of usual kind on each coxa I.

Abdomen typical. Tergal chaetotaxy, 4:4:4:4:6:6:6:6:7:7:4:0(4:4:4:4:-6:6:6:7:7:7:4:0). Sternal chaetotaxy,

$$\frac{2}{6}:(4)6(4):(4)6(4):12:11:10:12:10:9:0:\text{mm.}$$

Genital area typical.

Chelicera of usual facies. Palm with seven setae; fixed finger with eight to 10 regular teeth; movable finger with six to seven teeth; galeal elevation small but distinct; flagellum composed of eight unilaterally branched setae; serrula exterior of 18 blades.

Palps typical; surfaces smooth; setae long and acuminate. Proportions of podomeres and positions of tactile setae of chela generally as in other species of subgenus. Fixed finger of chela with 34 (34) widely spaced,

large, pointed macrodenticles and with about 20 small, rounded microdenticles alternating at distal end of row (cf. fig. 7). Movable finger with 21 (20) macrodenticles, about 10–15 tiny, alternating microdenticles and a row of 11 (16) low, rounded, contiguous teeth proximally; proximal end of movable finger with a small, bifurcated process extending from dorsal edge. Trochanter 2.0, femur 6.5 (7.0), tibia 2.1 (2.4), chela 6.8 (6.6), hand 2.5 (2.5) times as long as broad; movable finger 1.69 (1.67) times as long as hand.

Legs typical. Fourth leg with tactile setae on tibia 0.41 (0.42), on metatarsus 0.23 (0.25), and on telotarsus 0.34 (0.26) length of segment from proximal end.

Male: Unknown.

MEASUREMENTS (IN MM.): Female: Body length, about 2.8 (1.9); carapace, 0.64 (0.66) long. Chelicera, 0.58 (0.57) long by 0.31 (0.29) broad; movable finger, 0.31 (0.34) long. Palpal trochanter, 0.36 long by 0.18 broad; femur, 1.14 (1.12) by 0.18 (0.16); tibia, 0.45 (0.46) by 0.21 (0.19); chela, 1.74 (1.69) by 0.26 (0.26); hand, 0.65 (0.64) by 0.26 (0.26); movable finger, 1.09 (1.06) long, and with proximal process about 0.025 long. Leg I: basifemur, 0.66 (0.69) long by 0.10 (0.09); telofemur, 0.29 (0.28) by 0.09 (0.09); tibia, 0.34 (0.37) by 0.07 (0.07); tarsus, 0.72 (0.69) by 0.07 (0.07). Leg IV: entire femur, 0.91 (0.96) long; basifemur, 0.35 (0.36) by 0.30 (0.27); telofemur, 0.70 (0.71) by 0.27 (0.27); tibia, 0.65 (0.65) by 0.11 (0.11); metatarsus, 0.35 (0.36) by 0.09 (0.09); telotarsus, 0.75 (0.75) by 0.07 (0.06).

REMARKS: This species is named for Leslie Hubricht, an avid student of invertebrate animals, who collected the holotype.

Kleptochthonius (Chamberlinochthonius) stygius, new species

MATERIAL: Holotype male (WM 324.01002), two paratype males, and allotype female (WM 324.01001) collected November 29, 1958, by T. C. Barr, Jr., in Sadler Cave, 0.85 mile east-northeast of Sadler, Putnam County, Tennessee.

DIAGNOSIS: Male: (The first figures given are those for the holotype, in some cases followed in parentheses by those for the paratypes). A moderate-sized, four-eyed species, similar in general facies to other members of subgenus. Carapace a little longer than broad, lateral margins slightly convex; no epistome; two well-developed eyes in anterior position about twice their diameter from anterior margin, and two small and weakly corneate eyes in posterior position; surface smooth except for sides, which are finely sculptured. Carapacial setae 18 (18–19) with six (six or seven) on anterior margin and two near posterior edge. Coxal area typical; chaetotaxy,

2-2-1:0-3-1-CS:2-3:2-3:2-3. Seven (six or seven) spines of usual type on each coxa I.

Abdomen typical, but rather short in these specimens. Tergal chaetotaxy, 2:3:3:3:4:4:7:7:8:6:4:0 (2:2-3:2-3:2-3:4-5:5-6:7:7-8:8-9:6-8:-4:0). Sternal chaetotaxy,

$$\frac{3}{11}:(4-4):\frac{12-11}{(4)5(4)}:(4)8(4):11:11:11:11:12:10:0:\text{mm.}$$

(that of paratypes similar). Genital area typical.

Chelicera of usual facies. Palm with seven setae in holotype and one paratype, but in other paratype the left palm has only six setae; fixed finger with nine to 10 irregular teeth; movable finger with five to six (six to seven) similar teeth; galea represented by a very low ridge; flagellum of eight unilaterally branched setae.

Palps typical; surfaces smooth; setae long and acuminate. Proportions of podomeres and tactile setae of chela generally as in other species of the subgenus. Fixed finger of chela with a row of 43 (39-41) spaced, tall, sharp macrodenticles and with about 12 (16) tiny, rounded microdenticles alternating at distal end of row (cf. fig. 8). Movable finger with 20 (25) spaced macrocentricles alternating distally with about 10 (seven to 13) microdenticles and with 12 (13) low, rounded, contiguous teeth at proximal end of row; proximal end of movable finger with a medium to short bifurcated process on its dorsal edge. Trochanter 2.1 (2.0), femur 6.8 (5.7), tibia 2.4 (2.5), chela 6.9, and hand 2.5 times as long as broad; movable finger 1.73 times as long as hand.

Legs typical. Fourth leg with a tactile seta on tibia 0.40 (0.39-0.41), on metatarsus 0.30 (0.27-0.29), and on telotarsus 0.24 (0.25-0.29) length of podomere from proximal end.

Female: Generally similar to male but larger. Eyes like those of male. Carapacial setae 18 (6-2). Coxal chaetotaxy, 2-2-1:0-3-1-CS:2-3:-2-3:2-3. Eight spines on right and six on left coxa I.

Chaetotaxy of abdominal tergites, 2:3:4:4:6:6:7:8:9:7:4:0. Sternal chaetotaxy,

$$\frac{3}{6}:(4)8(4):(4)7(4):12:11:11:15:11:9:0:\text{mm.}$$

Genital area typical.

Chelicerae with seven setae on left palm, but only six on right; galeal ridge more prominent than that of male.

Palps similar to those of male. Fixed finger with 44 macrodenticles and 17 microdenticles; movable finger with 27 macrodenticles, 14 micro-

denticles, and 13 proximal, contiguous teeth. Trochanter 2.1, femur 6.7, tibia 2.4, chela 6.4, and hand 2.3 times as long as broad; movable finger 1.69 times as long as hand.

Fourth leg with tactile setae on tibia 0.42, on metatarsus 0.27, and on telotarsus 0.26, length of podomere from proximal end.

MEASUREMENTS (IN MM.): Male: Body length, 1.84 (1.88–1.86); carapace, 0.61 (0.61–0.62) long; greatest width, 0.58 (0.58); abdomen, 0.69 (0.80) wide. Chelicera, 0.50 (0.49–0.50) long by 0.23 (0.24) wide; movable finger, 0.26 (0.26–0.28) long. Palpal trochanter, 0.30 (0.29–0.31) long by 0.15 (0.15) broad; femur, 0.99 (0.99–1.0) by 0.15 (0.18); tibia, 0.39 (0.38) by 0.16 (0.15); chela, 1.45 by 0.21; hand, 0.54 by 0.22; movable finger, 0.93 (0.93) long and with proximal process, 0.036 (0.023–0.028) long. Leg I: basifemur, 0.58 (0.60) by 0.10 (0.07–0.09); telofemur, 0.23 (0.26) by 0.10 (0.08); tibia, 0.30 (0.31) by 0.07 (0.06–0.07); tarsus, 0.61 (0.61–0.62) by 0.06 (0.06). Leg IV: entire femur, 0.81 (0.83–0.85) long; basifemur, 0.31 (0.31–0.33) by 0.25 (0.21–0.23); telofemur, 0.58 (0.58–0.64) by 0.23 (0.20–0.22); tibia, 0.56 (0.57–0.58) by 0.11 (0.11); metatarsus, 0.29 (0.29–0.21) by 0.09 (0.08–0.09); telotarsus, 0.73 (0.72–0.74) by 0.06 (0.06).

Female: Body length, 2.32; carapace, 0.68 long, with greatest width 0.69; abdomen, 0.80 wide. Chelicera, 0.58 by 0.26 broad and with movable finger 0.29. Palpal trochanter, 0.35 long by 0.17 broad; femur, 1.18 by 0.18; tibia, 0.45 by 0.18; chela, 1.75 by 0.27; hand, 0.64 by 0.29; movable finger, 1.09 long and with proximal process 0.039 long. Leg I: basifemur, 0.68 by 0.09; telofemur, 0.26 by 0.10; tibia, 0.34 by 0.07; tarsus, 0.66 by 0.07. Leg IV: entire femur, 0.96 long; basifemur, 0.38 by 0.29; telofemur, 0.72 by 0.27; tibia, 0.64 by 0.12; metatarsus, 0.35 by 0.09; telotarsus, 0.80 by 0.07.

***Kleptochthonius* (*Chamberlinochthonius*) *daemonius*, new species**

MATERIAL: Holotype (WM 371.01007) and eight paratype males, allotype (WM 371.01012) and five paratype females taken in McElroy Cave, 2 miles south of Quebeck, Van Buren County, Tennessee, by T. C. Barr, Jr., on January 2, 1960, and December 20, 1960.

DIAGNOSIS: Male: (The first figures given are those for the holotype, in many cases followed in parentheses by the range for the eight male paratypes). A moderately large, four-eyed species, similar in general facies to other members of subgenus. Carapace slightly longer than broad, lateral margins a little convex, and distinctly narrowed posteriorly; no epistome; two good-sized corneate eyes in anterior position about 1.5 times their diameter from anterior margin, and two weakly corneate eyes in posterior position, their diameter about half of that of anterior eyes; surface

smooth except for fine reticulations on sides. Carapacial setae 18 (18–19), with six at anterior margin and two near posterior edge. Coxal area typical; chaetotaxy, 2–2–1:0–3–0–CS:2–2:2–3:2–3; coxal spines of usual type on coxae I, seven on right and nine on left (seven to 10 in paratypes).

Abdomen typical. Tergal chaetotaxy, 4:4:4:4:6:6:7:8:8:6:4:0 (3–4:4:–4:4–6:6:6–7:6–8:7–8:8–9:6:4:0). Sternal chaetotaxy,

$$\frac{4}{10}:(4-4):\frac{13-12}{(4)6(4)}:11:12:10:13:10:9:0:\text{mm.}$$

(that of paratypes similar). Genital area typical.

Chelicera of typical facies. Palm with seven setae in all specimens; fixed finger with 11–13 (11–13) irregular teeth; movable finger with six (five to nine) similar teeth and with a small roughened area on edge midway between proximal end of tooth row and tip of finger; no galeal elevation present, but spinning ducts clearly evident opening at usual position; flagellum of eight unilaterally branched setae; serrula exterior of 18 (17–19) blades.

Palps typical; surfaces smooth; setae long and acuminate. Proportions of podomeres and tactile setae of chela generally as in other species of subgenus. Fixed finger of chela with 31 (29–33) widely spaced, large, sharp macrodenticles and with 16 (16–20) moderate-sized microdenticles alternating at distal end of row (cf. fig. 9). Movable finger with 21 (18–22) spaced macrodenticles alternating with 14 (13–17) microdenticles and with a row of nine (eight to 14) low, rounded, contiguous teeth proximally; proximal end of movable finger with a medium-sized, bifurcated process on its dorsal edge. Trochanter 1.9 (1.8–2.0), femur 6.6 (6.6–7.2), tibia 2.3 (2.2–2.4), chela 6.8 (6.8–7.0), hand 2.7 (2.5–2.7) times as long as broad; movable finger 1.56 (1.56–1.64) times as long as hand.

Legs typical. Fourth leg with tactile setae on tibia 0.35 (0.37–0.39), on metatarsus 0.20 (0.20–0.25), and on telotarsus 0.24 (0.23–0.31) length of segment from proximal end.

Female: (First figures given are for the allotype, in many cases followed in parentheses by the range for the five paratype females). Generally similar to male but slightly larger. Eyes like those of male. Carapacial setae in all specimens 18 (6–2). Coxal chaetotaxy like that of male; coxal spines seven to eight (seven to nine).

Chaetotaxy of abdominal tergites, 4:4:4:4:6:6:8:9:8:6:4:0. Sternal chaetotaxy,

$$\frac{2}{5}:(4)8(4):(3)8(4):11:11:12:11:12:10:0:\text{mm.}$$

(that of paratypes similar).

Chelicera similar in most respects to that of male, but with a definite, though very small, galeal elevation.

Palps like those of male. Fixed finger with 31 (30–32) macrodenticles and 17 (17–19) microdenticles; movable finger with 21 (20–22) macrodenticles, 14 (13–16) microdenticles, and 11 (nine to 15) contiguous basal teeth. Trochanter 1.9 (1.9–2.1), femur 6.9 (6.2–6.9), tibia 2.3 (2.0–2.4), chela 6.6 (6.1–6.7), and hand 2.6 (2.4–2.6) times as long as broad; movable finger 1.53 (1.50–1.55) times as long as hand.

Fourth leg with tactile setae on tibia 0.36 (0.40–0.42), on metatarsus 0.24 (0.24–0.26), and on telotarsus 0.28 (0.24–0.30) length of segment from proximal end.

MEASUREMENTS (IN MM.): Male: Body length, 2.41 (2.31–2.64); carapace 0.58 (0.57–0.64) long, greatest width about 0.55; abdomen 0.84 (0.80–0.98) broad. Chelicera 0.66 (0.62–0.68) long by 0.29 (0.28–0.31) wide; movable finger 0.34 (0.29–0.34) long. Palpal trochanter 0.34 (0.31–0.35) long by 0.18 (0.16–0.18) broad; femur, 1.18 (1.13–1.26) by 0.17 (0.17–0.18); tibia, 0.42 (0.41–0.46) by 0.19 (0.18–0.20); chela, 1.71 (1.64–1.80) by 0.25 (0.24–0.27); hand, 0.66 (0.65–0.70) by 0.25 (0.24–0.27); movable finger 1.07 (1.02–0.12) long, and with proximal process 0.038 (0.030–0.047) long. Leg I: basifemur, 0.61 (0.64–0.73) by 0.10 (0.09–0.10); telofemur, 0.26 (0.26–0.30) by 0.09 (0.08–0.09); tibia, 0.32 (0.27–0.34) by 0.07 (0.07); tarsus, 0.67 (0.67–0.76) by 0.06 (0.07). Leg IV: entire femur 0.99 (0.95–1.07) long; basifemur, 0.39 (0.36–0.41) by 0.28 (0.26–0.29); telofemur, 0.69 (0.68–0.76) by 0.26 (0.24–0.26); tibia, 0.69 (0.65–0.72) by 0.11 (0.11–0.12); metatarsus, 0.33 (0.31–0.35) by 0.10 (0.09–0.10); telotarsus, 0.83 (0.78–0.87) by 0.06 (0.06–0.07).

Female: Body length, 2.33 (2.54–2.64); carapace 0.65 (0.64–0.67) long; greatest width, 0.67 (0.67–0.78); abdomen, 0.95 (0.84–1.09). Chelicera 0.71 (0.67–0.76) long by 0.32 (0.29–0.35) wide, movable finger 0.33 (0.33–0.37) long. Palpal trochanter, 0.37 (0.36–0.39) by 0.19 (0.17–0.20); femur, 1.26 (1.23–1.38) by 0.18 (0.18–0.20); tibia, 0.46 (0.44–0.51) by 0.20 (0.20–0.22); chela, 1.83 (1.79–1.96) by 0.28 (0.27–0.31); hand, 0.73 (0.71–0.78) by 0.28 (0.28–0.32); movable finger 1.12 (1.09–1.17) long and with proximal process 0.037 (0.033–0.048) long. Leg I: basifemur, 0.72 (0.70–0.77) by 0.11 (0.10); telofemur, 0.28 (0.28–0.31) by 0.10 (0.10); tibia, 0.37 (0.33–0.39) by 0.08 (0.07–0.08); tarsus, 0.79 (0.74–0.79) by 0.07 (0.07). Leg IV: entire femur, 1.04 (1.05–0.14) long; basifemur, 0.42 (0.41–0.46) by 0.29 (0.26–0.30); telofemur, 0.75 (0.75–0.80) by 0.27 (0.25–0.27); tibia, 0.71 (0.69–0.77) by 0.12 (0.12); metatarsus, 0.37 (0.35–0.39) by 0.10 (0.10); telotarsus, 0.84 (0.87–0.89) by 0.07 (0.07).

Kleptochthonius (Chamberlinochthonius) pluto, new species

MATERIAL: Holotype male (WM 375.01002), two male paratypes, and female allotype (WM 375.01003) collected April 8, 1960; one male and two females found February 28, 1959; and three males and four females found on March 19, 1961. All specimens collected by T. C. Barr, Jr., in Raven Bluff Cave, 3.5 miles north-northwest of Allons, Overton County, Tennessee.

DIAGNOSIS: Male: (The first figures given are for the holotype while in parentheses are given in many cases the ranges for the six male paratypes). A moderately large species similar in general facies to other members of subgenus. Carapace about as long as broad, lateral margins convex; no epistome. Four eyes present in most specimens; anterior pair moderately large and well developed; posterior pair only half of size of anterior and very weakly corneate (in two specimens no posterior eyes could be observed). Surface of carapace generally smooth, but with fine reticulations on sides. Carapacial setae 20 (18–22), with six on anterior margin and four (two to five) near posterior margin. Coxal area typical; chaetotaxy, 2–2–1:0–3–1–CS:2–2:2–3:2–3. Seven (six to eight) spines of usual type on each coxa I.

Abdomen typical. Tergal chaetotaxy, 4:4:4:4:5:6:6:9:9:8:4:0 (4:4:4:-4:4–6:5–6:6–7:7–8:8–10:6–7:4:0). Sternal chaetotaxy,

$$\frac{3}{12}:(4-4):\frac{14-13}{(4)9(4)}:(4)8(4):9:7:9:11:12:11:0:\text{mm.}$$

(that of paratypes very similar).

Chelicera of typical facies, nearly as long as carapace; palm with seven setae; fixed finger with 11 (nine to 12) irregular teeth; movable finger with a row of six (four to six) similar teeth and with a small roughened area between end of row and fingertip; galea represented by a very slightly elevated ridge; flagellum of eight unilaterally branched setae; serrula exterior of 18–20 plates.

Palps generally typical; proportions of podomeres and tactile setae of chela generally as in other species of subgenus. Fixed finger of chela with a marginal row of 39 (35–40) widely spaced, sharp macrodenticles and about 12 (13–19) very small microdenticles intervening between distal macrodenticles (cf. fig. 10). Movable finger with 25 (24–26) macrodenticles and about six (four to 14) intervening microdenticles and 12 (eight to 13) low, rounded, contiguous teeth at proximal end of row; proximal end of finger with a bifurcated process of moderate length extending from its dorsal edge. Trochanter 2.0 (1.9–2.2), femur 6.6 (6.5–6.9), tibia 2.3 (2.2–

2.5), chela 6.8 (6.5–7.1), and hand 2.7 (2.5–2.7) times as long as broad; movable finger 1.60 (1.57–1.65) times as long as hand.

Legs of typical facies. Leg IV with entire femur 3.6 (3.3–3.6), tibia 5.4 (5.5–6.2), metatarsus 3.6 (3.5–3.7), and telotarsus 13.0 (11.8–13.1) times as long as broad. Tactile setae of leg IV on tibia 0.38 (0.37–0.41), on metatarsus 0.25 (0.21–0.30), and on telotarsus 0.25 (0.20–0.28) length of segment from proximal end.

Female: (The first figures given are those for the allotype while in parentheses are given, in many cases, the ranges for the six paratype females). Generally similar to male. Four eyes present in all but one paratype, in which posterior pair was not evident. Carapacial setae 20 (18–20), of which six (six) are at anterior border and four (two to four) at posterior edge. Coxal and tergal chaetotaxy similar to that of male. Sternal chaetotaxy,

$$\frac{3}{6}:(4)6(4):(4)7(4):9:8:10:9:10:10:0:\text{mm.}$$

(that of paratypes similar).

Chelicera similar to that of male, but with galeal elevation somewhat larger and more distinct.

Palps like those of male. Fixed finger with 38 (34–39) macrodenticles and in 15 (15–17) microdenticles. Movable finger with 25 (22–26) macrodenticles, about 14 (five to 14) microdenticles, and eight (nine to 11) contiguous basal teeth. Trochanter 2.0 (1.9–2.1), femur 6.5 (6.3–6.6), tibia 2.1 (2.1–2.3), chela 6.7 (6.2–6.5), and hand 2.6 (2.4–2.6) times as long as broad; movable finger 1.61 (1.53–1.60) times as long as hand.

Leg IV with entire femur 3.5 (3.2–3.7), tibia 5.8 (5.4–5.8), metatarsus 3.6 (3.4–3.6), and telotarsus 13.1 (11.3–13.0) times as long as broad. Tactile setae on tibia 0.42 (0.38–0.45), on metatarsus 0.26 (0.23–0.27), and on telotarsus 0.31 (0.20–0.34) length of segment from proximal end.

MEASUREMENTS: (IN MM.): Male: Body length, 2.47 (2.17–2.55); carapace, 0.66 (0.64–0.70); greatest width, 0.66 (0.57–0.70); abdomen 0.84 (0.80–0.99) wide. Chelicera 0.64 (0.61–0.66) long by 0.29 (0.29–0.31) broad; movable finger 0.32 (0.28–0.34) long. Palpal trochanter 0.35 (0.33–0.37) long by 0.18 (0.16–0.18) broad; femur, 1.16 (1.08–1.21) by 0.18 (0.16–0.18); tibia, 0.43 (0.41–0.47) by 0.19 (0.18–0.20); chela, 1.69 (1.59–1.79) by 0.25 (0.23–0.28); hand, 0.66 (0.62–0.69) by 0.25 (0.23–0.28); movable finger 1.05 (0.98–1.11) long and with proximal process 0.033 (0.028–0.034) long. Leg I: basifemur, 0.61 (0.62–0.69) by 0.09 (0.10); telofemur, 0.26 (0.25–0.29) by 0.09 (0.09–0.10); tibia, 0.34 (0.33–0.37) by 0.07 (0.07); tarsus 0.68 (0.61–0.69) by 0.07 (0.06–0.07). Leg

IV: entire femur 0.99 (0.97–1.04) long; basifemur, 0.38 (0.36–0.40) by 0.28 (0.26–0.30); telofemur, 0.72 (0.66–0.76) by 0.26 (0.23–0.29); tibia, 0.67 (0.64–0.72) by 0.12 (0.10–0.12); metatarsus, 0.33 (0.31–0.34) by 0.09 (0.09–0.10); telotarsus, 0.76 (0.73–0.82) by 0.06 (0.06–0.07).

Female: Body length, 2.18 (2.32–2.71); carapace 0.69 (0.66–0.69) long; greatest width, 0.72 (0.67–0.73); abdomen, 0.88 (0.91–1.32) wide. Chelicera 0.67 (0.65–0.69) long by 0.31 (0.31–0.33) broad; movable finger, 0.32 (0.33–0.35) long. Palpal trochanter, 0.37 (0.33–0.38) by 0.18 (0.18–0.19); femur, 1.20 (1.15–1.24) by 0.18 (0.18–0.20); tibia, 0.45 (0.42–0.47) by 0.21 (0.20); chela, 1.75 (1.64–1.77) by 0.26 (0.26–0.29); hand, 0.68 (0.66–0.71) by 0.26 (0.26–0.29); movable finger 1.09 (1.03–1.09) long and with proximal process 0.029 (0.028–0.031) long. Leg I: basifemur 0.68 (0.65–0.69) long by 0.10 (0.10–0.11) broad; telofemur, 0.29 (0.26–0.29) by 0.10 (0.10); tibia, 0.35 (0.32–0.37) by 0.07 (0.07); tarsus, 0.68 (0.62–0.69) by 0.07 (0.07). Leg IV: entire femur 1.01 (0.98–1.04) long; basifemur, 0.40 (0.36–0.41) by 0.29 (0.27–0.31); telofemur, 0.73 (0.71–0.75) by 0.26 (0.24–0.30); tibia, 0.68 (0.66–0.72) by 0.12 (0.12); metatarsus, 0.34 (0.32–0.34) by 0.10 (0.09–0.10); telotarsus, 0.77 (0.74–0.78) by 0.06 (0.06–0.07).

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