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## Diplosphyronid Pseudoscorpions from New Mexico

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The present paper is the second of a series on the taxonomy and distribution of pseudoscorpions from New Mexico and is concerned with the 11 species of diplosphyronid pseudoscorpions now known to occur there. Of these 11 species, only two have been reported previously from the state. Four of the species are new ; one of these has been designated the type of a new genus.

The present investigation has been aided by University of New Mexico faculty research grants and by grants from the American Academy of Arts and Sciences and the National Science Foundation. Holotypes, allotypes, and duplicate paratypes of new species, as well as representative specimens of other species, are deposited among the collections of the American Museum of Natural History. Drawings were made from New Mexico specimens with the aid of a camera lucida.

### SUBORDER DIPLOSPHYRONIDA CHAMBERLIN

Holarctic pseudoscorpions of this suborder can be recognized by the division of the pedal tarsi into two segments. Rare exceptions in which the two tarsal segments of one or more legs are secondarily fused occur in Yucatan, in Australia and New Zealand, and in the East Indies. The suborder Diplosphyronida is divided into two superfamilies, Neobisioidea and Garypoidea. Representatives of both superfamilies occur in our area.

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## SUPERFAMILY NEOBISIOIDEA CHAMBERLIN

This superfamily is characterized by the presence of clearly defined teeth along the inner margin of the movable finger of the chelicera, by the lack of fusion of basal teeth of the serrula interior, and by the usually forked or dentate condition of the subterminal setae of the pedal tarsi. The superfamily is subdivided into five families, of which the three largest and most widely distributed are represented in our New Mexico fauna. These families are the Neobisiidae, the Syarinidae, and the Ideoroncidae. Of the two exotic families, the Hyidae occur in Mexico and the East Indies (Chamberlin, 1946) and the Vachoniidae (syn.: Gymnobisiidae Beier, 1947) are known only from southern Mexico (Chamberlin, 1947) and southern Africa (Beier, 1947). Each of these two families contains two small genera. It is interesting to note that Chamberlin described the family Vachoniidae less than three months prior to the publication of Beier's description of the synonymous family Gymnobisiidae.

## FAMILY NEOBISIIDAE CHAMBERLIN

The family is characterized by the presence of a venom apparatus only in the fixed finger, by the granulate nature of the pleural membrane, and by the position of the articulation between the pars basalis and pars tibialis of the third and fourth legs, this articulation being almost at a right angle with the long axis of the femur. The family contains two subfamilies, Neobisiinae and Ideobisiinae, each of which is represented by a single species in New Mexico.

## SUBFAMILY NEOBISIINAE CHAMBERLIN

Forms belonging to this subfamily are easily recognized by the absence of a typical galea on the movable finger of the chelicera, the galea being represented by no more than a sclerotic knob. This subfamily is represented in New Mexico by a single genus and species.

*MICROBISIUM* CHAMBERLIN

*Microbisium* CHAMBERLIN, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 10.

This holarctic genus is peculiar in the reduction of the number of tactile setae on the fixed chelal finger to seven and of the number on the movable chelal finger to three. Reproduction appears to be by parthenogenesis, and males are unknown. A single species is known from New Mexico.

*Microbisium parvulum* (Banks)

*Obisium parvulum* BANKS, 1895, Jour. New York Ent. Soc., vol. 3, p. 12.

*Microbisium parvulum*, CHAMBERLIN, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 21. HOFF, 1946, Bull. Chicago Acad. Sci., vol. 7, p. 495.

While a single species of *Microbisium* is at present known from New Mexico, the occurrence of *M. confusum* Hoff, 1946, in Colorado and Kansas (according to unpublished data) indicates a strong possibility of the eventual discovery of a second species in at least the northeastern part of the state. With this in mind, it seems advisable to indicate methods for separation of the two closely related species, which differ chiefly in the size and length/width ratios of palpal podomeres. In *M. parvulum* the femur is over 0.4 mm. long, in contrast to a length of less than 0.4 mm. for *M. confusum*. The femur of *M. parvulum* is stouter than that of *M. confusum*, being usually 2.9 or less in the former and 2.9 or more in the latter, but so much overlapping in the ranges of the two species occurs that this character is much less useful than others for the separation of the two species. With respect to the chela, that of *M. parvulum* is 0.65 mm. or more in length while that of *M. confusum* is less than 0.65 mm. long. When specimens are laid side by side, it is evident that the chela is stouter in *M. parvulum* than in *M. confusum*, the length/width ratio in the former being usually less than 2.8, in contrast to a length/width ratio in *M. confusum* of more than 2.9. These measurements and ratios are given with reservation, it being understood that in any large series of specimens the size and length/width ratios of a few specimens of one species may extend into the range demonstrated by the other species. In addition to the differences in size and ratio of the palpal podomeres, there is a constant difference in the shape of the podomeres and in the color of the palps. In *M. parvulum* the palps are a deep golden color, while in *M. confusum* the palps are a light golden color. The color difference appears definite and constant in specimens presently available for study.

RECORDS: *Bernalillo County*: Just north of Alameda, from cottonwood litter on sandy soil, 5000 feet elevation. *Doña Ana County*: From the rotten wood of a cottonwood stump in a wet area along the Rio Grande about 12 miles south of Hatch, elevation about 4100 feet. *Sandoval County*: One collection from just west of Bernalillo, elevation about 5000 feet; one collection taken 2 miles southwest of Bernalillo, elevation about 5000 feet; one collection from just northwest of Pena Blanca, 5300 feet elevation; all from cottonwood litter. *Socorro County*: Collection taken from cottonwood litter, 8 miles south of Socorro, elevation 4500 feet. *Taos*

*County*: Collection taken from thick birch litter near the Red River, between Red River Village and Questa, elevation 8000 feet. All collections were obtained by use of Berlese funnels. *Microbisium parvulum* is clearly associated with the litter of deciduous trees, especially Rio Grande cottonwood, *Populus wislizeni* (Watson) Sargent.

#### SUBFAMILY IDEOBISIINAE CHAMBERLIN

Pseudoscorpions of this subfamily may be recognized by the presence of one or more well-developed galeae on the movable cheliceral finger. A single genus is recorded from New Mexico.

#### MICROCREAGRIS BALZAN

*Microcreagris* BALZAN, 1891, Ann. Soc. Ent. France, vol. 60, p. 543. CHAMBERLIN, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 22.

This genus is characterized by the following combination of characters: maxilla apically rounded and with three to five apical setae; each chelal finger with at least one tactile seta on the terminal third of the finger; tactile setae of the movable chelal finger normally distributed along the length of the finger, not with three of the setae clustered in a very close submedial group; movable cheliceral finger with a single simple or weakly branched galea. The genus is holarctic in distribution and contains at least 50 species. Some of these are inadequately described and poorly known. Only one species is reported from New Mexico.

In connection with the genus *Microcreagris*, attention may be called to the fact that Beier (1932) tentatively assigned *Obisium transversum* Banks, 1909, species *incertae sedis* from Pecos, New Mexico, to the genus *Microcreagris*. It is now known that *Obisium transversum* belongs in the genus *Chitrella*, as indicated elsewhere in the present publication.

#### *Microcreagris laudabilis*, new species

##### Figures 1-5

MALE: The description of the male is based on the holotype and five paratypes. Measurements are given only for the holotype except that, for the more taxonomically important measurements, the range of all six males is given in parentheses following the corresponding measurement of the holotype. Body fairly stout, appendages moderately slender; palps deep reddish orange, carapace deep golden to reddish golden color, abdomen a rich golden brown color, and legs very light to medium yellowish brown; length of entire animal 4.3 (3.8-4.3) mm. Carapace a little longer than wide, posterior margin nearly straight, anterior margin

distinctly marginate and with a poorly developed epistome, lateral margins nearly parallel; sides of carapace with weakly developed, net-like markings, dorsal surface smooth; two pairs of fairly well-developed eyes; posterior margin of carapace with six (occasionally seven) setae; length 1.26 (1.19–1.28) mm., greatest width just anterior to the posterior margin and equal to 1.09 (1.08–1.18) mm., ocular width 0.99 (0.99–1.07) mm. Abdomen long, not greatly widened centrally; sternites and tergites virtually smooth except for very weakly developed, net-like lines that are seen only by very careful observation; first tergite with six to eight marginal setae, second tergite with eight to 12 marginal setae, tergites of the central part of the abdomen usually with 12 to 14 marginal setae; usually about 16 setae along the posterior margin of each sternite of the central part of the body; abdomen about 1.5 to 1.6 mm. in width, but subject to some spreading due to mounting.

Chelicera of golden color; with three (sometimes two or four) accessory setae on the cheliceral hand much as indicated for the chelicera of *M. sequioae* by Chamberlin (1931, fig. 12A) except that the three accessory setae of the present species frequently fall into a line, with *sb* sometimes located on an extension of one end of the line; fixed finger with about 16 to 18 acutely pointed teeth, somewhat variable and irregular in size and shape; movable finger with about 18 to 20 teeth; galea well developed, trifid or bifid near the terminal third and often with each ramus subterminally divided, the branches terminally irregular; length of chelicera 0.60 mm., width 0.36 mm.; length of movable finger 0.48 mm.

Palps very deep reddish golden in color, slender; surface of podomeres smooth, setae fairly numerous and long acuminate. Maxilla with five (rarely four or six) terminal setae. Trochanter with pedicel wider than long; flexor margin medially convex and sometimes nearly straight beyond; extensor margin a little concave, but unevenly so; length 0.71 (0.67–0.74) mm., width 0.35 (0.33–0.36) mm., length 2.03 (1.97–2.06) times the width. Femur with pedicel very weakly separated from the rest of podomere; greatest width near the distal end; extensor surface very weakly convex and sometimes almost straight in the center; flexor surface nearly straight except for a weak concavity near the distal end; 1.43 (1.33–1.45) mm. long, 0.33 (0.31–0.34) mm. wide, length 4.34 (4.15–4.34) times the width. Tibia with pedicel often two times as long as wide; extensor margin often somewhat flattened or with a shallow concavity proximal to the center, margin weakly convex both proximal and distal to the concavity or flattened portion; flexor margin convex in the center and nearly straight beyond; 1.26 (1.17–1.29) mm. long, 0.37 (0.34–0.38) mm. wide, length 3.4 (3.25–3.5) times the width. Chela from the dorsal

side with pedicel nearly square in outline, displaced a little towards the extensor surface of the hand and marked by net-like lines; extensor margin of hand gently convex, flexor margin slightly more convex in the basal half than the extensor margin; fingers slender and well curved; chela 2.19 (2.10–2.30) mm. long, 0.55 (0.50–0.575) mm. wide; 3.99 (3.95–4.2) times longer than wide. In lateral view, hand is subcylindrical and basally symmetrical; fixed finger nearly straight and bearing usually between 70 and 80 subacute to rounded teeth extending along nearly the entire finger margin; movable finger slightly curved and with teeth similar in shape, number, and distribution to those of the opposing finger; tactile setae as shown in figures 2 and 3; chelal hand 1.10 (1.07–1.17) mm. long, 0.49 (0.44–0.525) mm. deep; movable finger 1.24 (1.14–1.27) mm. long.

Legs light brownish yellow in color; fairly slender; with numerous long acuminate setae, especially in the distal podomeres; subterminal setae forked and with each branch frequently bearing one or more spinose processes. First leg with pars basalis weakly subcylindrical, gradually becoming of greater depth towards the distal margin, length 0.64 mm., depth 0.18 mm.; pars tibialis nearly cylindrical but with both margins very slightly convex, greatest depth near the center of the podomere, length 0.46 mm., depth 0.17 mm.; tibia very weakly S-shaped, deepest near the distal end, length 0.62 mm., depth 0.135 mm.; metatarsus distinctly cylindrical, 0.32 mm. long, 0.12 mm. deep; telotarsus subcylindrical, length 0.47 mm., depth 0.10 mm. Fourth leg with trochanter deepest at about the distal one-third, 0.50 mm. long, 0.20 mm. deep; pars basalis 0.56 mm. long as measured along the flexor margin, 0.335 mm. deep; pars tibialis 0.64 mm. long as measured along the extensor margin, 0.335 mm. deep; entire femur with flexor surface very weakly convex, extensor surface much more convex, greatest depth near the suture between the two parts, length of entire femur 1.18 mm.; tibia relatively very slender and weakly S-shaped, length 1.10 mm., depth 0.17 mm.; metatarsus cylindrical, 0.43 mm. long, 0.14 mm. deep, with a long tactile seta on the extensor surface 0.06 mm. from the proximal corner; telotarsus cylindrical, 0.57 mm. long, 0.12 mm. deep, with a long tactile seta on the extensor surface 0.23 mm. from the proximal margin.

Genitalia of male with a medially placed compact clump of about 25 setae on the anterior operculum just anterior to the aperture; posterior operculum with nearly 30 setae (including those associated with the spiracles) in a marginal row across the entire width of the operculum, and with usually six to eight setae placed medially between the marginal row and the aperture.

FEMALE: The description of the female is based on the allotype and six paratypes. Measurements given for the allotype are, for the more taxonomically important measurements, followed in parentheses by the range for all seven females.

Female very similar to the male in color, chaetotaxy, and sculpturing; female somewhat larger than the male and with less slender palpi. Body of female 4.8 (4.6–5.5) mm. long; carapace 1.34 (1.26–1.34) mm. long, 1.19 (1.12–1.26) mm. wide, ocular width 1.02 (1.02–1.09) mm.; abdomen between 1.5 and 1.7 mm. wide, but subject to some spreading because of preparation technics employed. Chelicera of female virtually identical with that of the male; chelicera 0.66 mm. long, width of base 0.39 mm., movable finger 0.54 mm. long. Palpi of female very similar to those of the male in chaetotaxy, sculpturing, and general shape of podomeres; differing by having palpal podomeres (with exception of the trochanter) so much stouter that it is possible to determine the sex of alcoholic specimens on the basis of this difference alone; the podomeres of the female are also on the average slightly, but not significantly, longer. Trochanter of the female virtually identical in shape to that of the male, 0.74 (0.69–0.81) mm. long, 0.37 (0.37–0.38) mm. wide, length 2.0 (1.86–2.13) times the width. Femur conspicuously stouter in the female than in the male; shape agreeing closely with that of the male; greatest width slightly proximal to the distal end; 1.42 (1.38–1.54) mm. long, 0.36 (0.34–0.38) mm. wide, length 3.95 (3.9–4.12) times the width. Tibia essentially like that of the male but a little stouter, 1.24 (1.19–1.31) mm. long, 0.40 (0.38–0.43) mm. wide, length 3.1 (2.91–3.25) times the width. Chela from dorsad conspicuously stouter than in the male; hand with both the flexor and extensor margins convex, the flexor much more so than the extensor, especially in the basal half; base of hand somewhat asymmetrical; fingers relatively slender and well curved; chela 2.28 (2.24–2.41) mm. long, 0.64 (0.60–0.65) mm. wide, length 3.58 (3.56–3.75) times the width. In lateral view chelal hand subcylindrical, narrowing very little at the base of the fingers; fixed finger nearly straight, movable finger slightly curved; teeth and tactile setae essentially as in the male; hand 1.12 (1.12–1.21) mm. long, 0.59 (0.57–0.61) mm. deep; movable chelal finger 1.17 (1.17–1.3) mm. long.

Legs of the female virtually identical, even in size, with the legs of the male. First leg with pars basalis 0.65 mm. long, 0.19 mm. deep; pars tibialis 0.46 mm. long, 0.17 mm. deep; tibia with length of 0.65 mm., depth of 0.14 mm.; metatarsus 0.33 mm. long, 0.12 mm. deep; and telotarsus 0.48 mm. in length, 0.12 mm. in depth. Fourth leg with trochanter 0.53 mm. in length, 0.225 mm. in depth; pars basalis measured along the

flexor margin 0.58 mm. long, 0.35 mm. deep; pars tibialis measured along the extensor margin 0.64 mm. long, 0.35 mm. deep; entire femur 1.20 mm. in length; tibia 1.12 mm. long, 0.17 mm. deep; metatarsus 0.40 mm. in length, 0.14 mm. in depth, and with tactile seta of extensor margin inserted 0.06 mm. from the proximal margin of the podomere; telotarsus 0.55 mm. long, 0.13 mm. deep, tactile seta located 0.25 mm. from the proximal-extensor corner.

Genitalia of female without significant taxonomic characteristics; the anterior operculum with a median and irregular row or group of four to eight small setae; posterior operculum with a marginal row of about 25 setae extending across the entire width of the operculum.

TRITONYMPH: The condensed description is based on a single paratype. Tritonymph in general much like the adult; body lighter in color, especially the palpi; length of body 3.8 mm.; carapace 0.93 mm. long, 0.85 mm. wide, ocular width 0.70 mm. Chelicera of nymph agreeing well with that of the adult. Palpus of nymph much lighter in color and with stouter podomeres than in the adult; maxilla with four setae on the anterior tip; trochanter 0.49 mm. long, 0.26 mm. wide; femur with slightly convex flexor margin, 0.91 mm. long, 0.25 mm. wide; tibia with extensor margin almost evenly convex throughout, 0.79 mm. long, 0.29 mm. wide; chela from dorsad with pedicel wider than long, both flexor and extensor margins moderately convex, fingers fairly well curved, chela 1.48 mm. long, 0.405 mm. wide. In lateral view chelal hand subcylindrical, basally symmetrical, fixed finger fairly stout and straight, movable finger more slender and very gently curved; marginal teeth like those of the adult but fewer than 60 in number on each finger; movable finger with three tactile setae, fixed finger with seven tactile setae.

REMARKS: The presence of many inadequately described species assigned to the genus *Microcreagris* makes difficult and questionable any attempts to determine intrageneric relationships. The slender palpi and large body size of our present species indicate a relationship to several species found in the western part of the United States, but exact relationships cannot be determined with any degree of satisfaction. The present species is easily separated from other species of *Microcreagris* by characteristics of the carapace and palps.

The present author has made every possible effort to avoid describing as new any of the several Rocky Mountain or Southwestern species originally described by Banks (1908, 1909) and at present poorly known and questionably assigned to a variety of genera. Among the species inadequately described by Banks is *Ideobisium tibiale* Banks, 1909, from 8000 feet elevation near Florissant, Colorado. Our present specimens of *Microcreagris laudabilis* show considerable agreement with the original



description of *Ideobisium tibiale*, especially with respect to color, body size, and shape of carapace and palpal podomeres. Our present species differs, however, from *tibiale* by having slender chelal fingers with a length slightly exceeding the length of the hand, this being contrary to the description by Banks, who states "fingers plainly shorter than hand, stout and but little curved." With respect to *I. tibiale* it seems to the present writer that the description favors an assignment of this species *incertae sedis* to the genus *Microcreagris* rather than to the genus *Syarinus* as suggested by Chamberlin (1930). The only satisfactory way in which to certify the generic assignment of the species *tibiale* will be to examine the single type individual deposited in the collections of the Museum of Comparative Zoölogy at Harvard College.

RECORDS: This species is known only from the type specimens, all taken on July 21, 1953, near the top of Mt. Taylor, northeast of Grants, Valencia County, New Mexico. The specimens were taken at elevations between 11,150 and 11,300 feet in a well-developed climax fir forest on a fairly steep north slope. The holotype male, the allotype female, 14 paratype males, and 13 paratype females were taken from beneath rocks partly buried in deep fir litter at 11,150 feet elevation, the specimens in this habitat being very abundant, with one or more individuals on the under side of each rock. One male paratype was taken in the same place by sifting fir litter. In addition one female paratype and one tritonymph paratype were secured by use of Berlese funnels from deep fir litter at 11,200 feet elevation and one female paratype was taken by sifting deep fir litter at 11,300 feet. The specimens appear to be restricted to a very small area, not over a few hundred yards in diameter. Unsuccessful efforts have been made to find this species in similar habitats and at comparable elevations in other mountainous areas of New Mexico. Some consideration must be given to the possibility that this species is endemic, but much more extensive field collecting will be necessary before such a statement is adequately substantiated.

#### FAMILY SYARINIDAE CHAMBERLIN

Pseudoscorpions of this family are easily recognized by the presence of a venom duct in only the fixed chelal finger; the evenly striate and non-granular pleural membranes; and the position of the articulation between the pars basalis and the pars tibialis of the third and fourth legs, this articulation being at least slightly oblique and usually strongly oblique to the long axis of the femur. The family is subdivided into two sub-families, Syarininae and Chitrellinae, each of which is represented in our New Mexico fauna.

## SUBFAMILY SYARININAE CHAMBERLIN

This subfamily was established by Chamberlin (1930) for syarinid pseudoscorpions characterized by the presence of a galea that by its insertion makes the outer margin of the movable finger emarginate. In addition the articulation between the pars tibialis and pars basalis of the fourth leg is strongly oblique to the long axis of the leg, and the subterminal tarsal setae are always simple and acute. Two genera, *Syarinus* and *Hyarinus*, known only from western United States belong in this subfamily. *Syarinus* alone occurs in New Mexico.

## SYARINUS CHAMBERLIN

*Syarinus* CHAMBERLIN, 1925, California Univ. Publ., Tech. Bull., College Agr., Ent., vol. 3, p. 329; 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 39.

Pseudoscorpions of this genus are characterized by having a movable chelal finger, on the external surface of which there are four tactile setae, with *t* and *st* close to one another, and along the margin of which there are contiguous teeth. These characters are in direct contrast to those of the genus *Hyarinus* Chamberlin, 1925, in which the movable chelal finger has only three tactile setae and the marginal teeth of the finger are spaced. Only three species are irrevocably assigned to the genus *Syarinus*. All of these are herein reported from New Mexico. In addition to these three species, Chamberlin (1930) has suggested that *Ideobisium tibiale* Banks, 1909, from Colorado may also belong to the genus *Syarinus*. As mentioned elsewhere in the present paper, the writer believes that Banks's *tibiale* should be assigned to the genus *Microcreagris*.

KEY TO SPECIES OF THE GENUS *Syarinus*

1. Surface of palpal femur smooth . . . . . *S. obscurus* (Banks)  
     Surface of palpal femur at least in part strongly and conspicuously  
     granulate . . . . . 2
2. Palpal femur less than 3.4, tibia less than 3.0, and chela less than 3.6 times  
     as long as wide . . . . . *S. granulatus* Chamberlin  
     Palpal femur over 3.5, tibia over 3.0, and chela over 3.7 times as long as  
     wide . . . . . *S. honestus*, new species

*Syarinus obscurus* (Banks)

## Figures 6-7

*Ideoroncus obscurus* BANKS, 1893, Canadian Ent., vol. 25, p. 66.

*Syarinus obscurus*, CHAMBERLIN, 1925, California Univ. Publ., Tech. Bull., College Agr., Ent., vol. 3, p. 330; 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 39; 1931, Stanford Univ. Publ., Biol. Sci., vol. 7, figs. 9D, 15F, 17L, M, 19E, 25K, 43S, T, and 47D.

Because this species is inadequately described in the literature and there is some doubt regarding the correct species assignment of our single specimen, a somewhat detailed description of the single available New Mexico male seems advisable.

Body and appendages fairly stout; color of palps reddish golden, rest of body and legs moderately brownish yellow; body length 3.0 mm. Carapace with nearly straight posterior margin; lateral margins nearly parallel except convex in the anterior one-third; anterior margin well rounded and with little indication of an epistome; 10 setae along the posterior margin, dorsal surface almost free of setae; surface of carapace smooth except for net-like markings on the lateral surfaces; one poorly developed eye on each side; carapace 0.76 mm. long, greatest width along posterior margin 0.74 mm.; ocular width 0.57 mm. Abdomen not much wider than carapace; lateral margins of abdomen nearly parallel; first tergite with nine marginal setae, each tergite of central part of abdomen with 12 to 14 setae, rarely as many as 16; each sternite of central part of abdomen with about 15 setae; sternites and tergites smooth except for small areas of extremely weak, net-like sculpturing on some sternites; abdomen a little less than 1 mm. wide.

Chelicera a golden color; the surface of the proximal one-half of the movable finger and the medial surface of the base of the chelicera with well-spaced, scale-like markings; one chelicera with six setae (two accessory) on the cheliceral hand and the other with five setae (one accessory) as shown for *S. granulatus* by Chamberlin (1931, fig. 13M); fixed finger with 13 regularly spaced retroconical teeth along almost the entire finger margin; movable finger with six acutely pointed conical teeth along the distal one-fourth of the finger length, the two more distally placed teeth in one chelicera acutely bicuspid; apical tooth of movable finger more slender than shown by Chamberlin (1931, fig. 17M); galea simple, slender, acute, and extending well beyond the level of the apical tooth of the finger, not short and stout as shown by Chamberlin (1931, fig. 17M); chelicera 0.32 mm. long, base 0.20 mm. wide; movable finger 0.27 mm. long.

Palpus in dorsal view with no indication of sculpturing except for a restricted area of weakly to moderately developed granules on the inner and outer distal area of the hand and base of the fingers, the weak granules of the basal portion of the fingers not readily seen, however, except in lateral view; setae fairly numerous, long, and acuminate. Trochanter with flexor margin weakly convex, extensor margin more strongly convex in the center, 0.485 mm. long, 0.22 mm. wide. Femur with pedicel a little wider than long; basal half of flexor margin convex and with a

somewhat irregular contour, concave beyond; extensor margin uniformly and evenly convex; greatest width near the center; length 0.76 mm., width 0.245 mm. Tibia with pedicel longer than wide; flexor surface beyond the pedicel evenly and markedly convex; extensor surface with a slight concavity near the proximal one-third of the margin, evenly and conspicuously convex beyond; length 0.66 mm., width 0.29 mm. Chela with nearly square pedicel; both extensor and flexor margins evenly convex and merging without interruption into the basal margin; pedicel displaced slightly towards the flexor side; fingers fairly stout and well curved; chela 1.18 mm. long, 0.39 mm. wide. From the side, chelal hand almost cylindrical with dorsal and ventral margins nearly parallel and very little convex; fingers stout, fixed finger more so than the movable finger; inner margin of fixed finger nearly straight and with 33 well-developed conical teeth along nearly the entire margin; movable finger with inner margin slightly concave, 35 teeth similar in shape and arrangement to the teeth of the opposing finger; tactile setae of chelal fingers as indicated in figures 6 and 7; chelal hand 0.65 mm. long, 0.35 mm. deep; movable finger 0.58 mm. long.

Legs fairly stout, yellow in color, surface smooth, outline of podomeres and chaetotaxy much as shown by Chamberlin (1931, figs. 43S, T) except for the presence of a long tactile seta on the flexor surface of the tibia of the fourth leg. Measurements for the first leg include: pars basalis of femur 0.18 mm. long as measured along the flexor margin, 0.155 mm. deep; pars tibialis with a length of 0.255 mm. as measured along the extensor margin, 0.162 mm. deep; tibia 0.346 mm. long, 0.120 mm. deep; metatarsus 0.14 mm. long, 0.084 mm. deep; telotarsus 0.195 mm. long, 0.076 mm. deep. Measurements for the fourth leg include; length of pars basalis measured along the flexor margin 0.285 mm., depth 0.20 mm.; pars tibialis measured along the extensor margin 0.49 mm. long, 0.23 mm. deep; entire femur 0.67 mm. long; tibia 0.47 mm. long, 0.14 mm. deep, with a tactile seta located on the extensor surface 0.19 mm. from the proximal margin; metatarsus 0.173 mm. long, 0.103 mm. deep, with a tactile seta on the extensor surface 0.05 mm. from the proximal margin; telotarsus 0.243 mm. long, 0.09 mm. deep, tactile seta of extensor surface wanting.

Genitalia very weakly sclerotic; anterior operculum with 19 well-scattered setae occupying the intercoxal area; margin of posterior operculum with 22 marginal setae, these including some clustered just anterior to the respiratory spiracles.

REMARKS: In considering the possible identification of our specimen from New Mexico, the writer very carefully checked the specimen against

the original description of *Ideoroncus obscurus* Banks, 1893, and found very close agreement. However, when the specimen was checked against the description of *Syarinus obscurus* as given by Chamberlin (1930) and against available figures (Chamberlin, 1931) a few minor differences were noted. For instance, the palpal femur of our specimen is more slender than indicated by Chamberlin in his description (1930) and the galea is long, slender, and acute, this being in contrast to the galea figured by Chamberlin (1931, fig. 17M). Owing to these differences, it was impossible to establish identification of our specimen until, through the kindness of J. C. Chamberlin, several specimens of *S. obscurus* (including a cotype from the original collection of Banks) were obtained on loan. A close study indicates that the present specimen is very probably conspecific with the cotype and with Washington, California, and Wyoming specimens assigned by Chamberlin to *S. obscurus*, even though the palpal podomeres are slightly smaller and the palpal femur in our specimen is a little more slender than in any other specimens available. The length/width ratio of the femur of our New Mexico specimen is approached, however, by the ratio in a female from Yellowstone National Park (Chamberlin collection).

The chief source of difficulty in making a determination based only on the literature is the considerable variation in the shape of the palpal femur and chela and in the form of the galea. A study of a series of specimens indicates that the femur may vary greatly in shape, especially along the basal portions of the extensor and flexor margins. The extensor margin may be abruptly swollen just distal to the pedicel, or it may be very gently and regularly convex between the pedicel and the midpoint of the femur. With respect to the flexor margin, the regularity of the contour of the basal half of the margin is broken to varying degrees at one or two points, the extent of these breaks ranging from hardly observable to very marked and conspicuous. The shape of the chelal hand in dorsal view is also somewhat variable, especially in the degree of convexity of the outer or extensor margin. This margin varies from being as conspicuously and as regularly curved as the flexor margin in some specimens to being distinctly flattened throughout its length in other specimens. There is also some difference in the relative lengths of the hand and movable finger of the chela, ranging from a finger that is distinctly shorter than the hand without the pedicel to a finger that is almost equal in length to the length of the hand. The galea also shows some variation, this structure ranging from a simple, slender, and terminally acute galea to one in which there is a single median branch.

As the nature and extent of variations in the general shape of palpal

femur and chela of *S. obscurus* are not well known, it appears advisable to consider our single specimen from New Mexico as belonging to this species. When more specimens are available for study, it may become clear that the form from New Mexico belongs to an undescribed species.

Because the actual sizes in addition to the length/width ratios of palpal podomeres are important in species identification, the measurements for palpal podomeres of the female cotype borrowed from J. C. Chamberlin are given here: trochanter 0.535 mm. long, 0.245 mm. wide; femur 0.84 mm. long, 0.30 mm. wide; tibia 0.74 mm. long, 0.34 mm. wide; chela 1.28 mm. long, 0.40 mm. wide; chelal hand 0.71 mm. in length, 0.375 mm. in depth; movable chelal finger 0.59 mm. long.

The type locality of *S. obscurus* is Olympia, Washington. In addition, specimens have been reported from California and Wyoming (Chamberlin, 1925, 1930).

RECORD: A single male was taken from beneath the bark of a large and very rotten and dry yellow-pine stump in an area of mixed fir and aspen a few miles east of Canjilon on the road to El Rito, Rio Arriba County, at an elevation of 8650 feet.

*Syarinus honestus*, new species

Figures 8-9

MALE: The description of the male is based on one individual, the holotype. Body fairly stout, palpi somewhat slender; carapace and abdomen light golden brown, palpi of deep reddish golden color; setae long and numerous; body, with abdomen perhaps a little contracted, 2.35 mm. long. Carapace nearly square in outline; dorsal surface smooth, lateral surfaces with weakly developed, net-like lines at least along the ventral edge; lateral margins nearly straight, anterior margin moderately convex and with a very weak impression at the point usually occupied by the epistome; one weakly developed eye on each side, removed from the anterior carapacial margin by more than the diameter of the eye; posterior margin with nine setae; length of carapace 0.71 mm., greatest width at the posterior margin 0.72 mm., ocular breadth 0.58 mm. Abdomen with sides nearly straight and parallel; abdomen not much wider than the carapace; each tergite of the central part of the abdomen with about 16 setae; each sternite of the central part of the body with 20 to 25 setae; surface of sternites and tergites smooth.

Chelicera moderately stout; setae of base of hand variable, one chelicera with six and the other with seven setae; movable finger and hand at base of fixed finger with scale-like sculpturing; fixed finger with about

15 conical teeth; movable finger with six teeth, the distal three conical and the proximal three sublunate, all located distal to the level of the insertion of the galeal seta; galea simple, slender, acute, reaching beyond the level of the apex of the finger; chelicera about 0.33 mm. long and 0.20 mm. wide; movable finger 0.29 mm. long.

Palpi fairly slender; surface of podomeres smooth except for fine and evenly spaced granules on the extensor surface and along the basal one-half of the flexor margin of the trochanter, the flexor surface of the femur, and the distal-flexor surface of the hand near the base of the fingers. Trochanter with well-defined pedicel wider than long; extensor and flexor margins beyond the pedicel nearly parallel and straight; trochanter 0.54 mm. long, 0.19 mm. wide. Femur with clearly defined pedicel about as long as wide; flexor margin very weakly and gently concave beyond the pedicel; extensor margin moderately and somewhat evenly convex; femur widest just within the distal half; 0.79 mm. long, 0.215 mm. wide. Tibia with pedicel longer than wide; flexor surface gently convex distal to the pedicel, becoming less convex in the distal third; extensor margin with a weak concavity distal to the pedicel, gently convex beyond; tibia 0.76 mm. long, 0.24 mm. wide. Chela from dorsad with nearly square pedicel; hand subcylindrical, with both margins very weakly convex; pedicel displaced somewhat towards the flexor margin; hand not much narrowed proximal to the finger base; fingers gently curved; chela 1.29 mm. long, 0.33 mm. wide. In lateral view chelal hand with dorsal margin weakly convex, ventral margin nearly straight; both margins joining without marked interruption the basal margin of the hand; granules of the distal-flexor surface of the hand not conspicuous in lateral view; movable finger gently curved, with about 55 subacutely to obtusely pointed teeth; fixed finger more or less straight and with about 50 teeth similar in shape to those of the opposing finger; tactile setae of the fingers as shown in figures 8 and 9; hand 0.70 mm. long, 0.32 mm. deep; movable finger 0.63 mm. long.

Legs light in color, podomeres fairly stout, numerous and long acute setae. First leg with trochanter having a gently convex flexor margin, 0.153 mm. long, 0.113 mm. deep; pars basalis with extensor margin gently and evenly concave, flexor margin very weakly convex, 0.247 mm. long as measured along the extensor margin, 0.125 mm. deep; pars tibialis subcylindrical with margins nearly straight, 0.265 mm. long as measured along the extensor margin, pars tibialis 0.132 mm. deep; tibia with flexor margin gently convex, extensor margin nearly straight except near the proximal end, 0.35 mm. long, 0.095 mm. deep; both metatarsus and telotarsus subcylindrical; metatarsus about 0.12 mm. long, 0.76 mm.

deep; telotarsus 0.206 mm. long, 0.072 mm. deep. Fourth leg with trochanter subcylindrical, flexor surface gently and evenly curved, 0.255 mm. long, 0.115 mm. deep; pars basalis subtriangular, 0.243 mm. long, 0.152 mm. deep; pars tibialis with both margins very gently convex except for the proximal part of the extensor margin, 0.49 mm. long, 0.175 mm. deep; entire femur 0.63 mm. long; tibia with the flexor margin weakly convex and the extensor margin weakly convex basally but straight beyond, a long tactile seta on the extensor surface 0.183 mm. from the proximal-extensor corner, 0.45 mm. long, 0.121 mm. deep; metatarsus subcylindrical and with a long tactile seta on the subextensor surface 0.044 mm. from the proximal margin, 0.163 mm. long, 0.095 mm. deep; telotarsus subcylindrical, little narrowed distally, no tactile seta evident, 0.227 mm. long, 0.088 mm. deep.

External genitalia very weakly sclerotic; anterior operculum with 18 setae in an irregular row along the edge of the aperture, 15 setae on the face of the operculum anterior to the marginal row; posterior operculum with about 30 setae (including those associated with the spiracles) distributed in a single row across the entire width of the operculum except for a short medial area that is devoid of setae.

FEMALE: Unknown.

REMARKS: While the writer is critical of describing a new species from a single unique individual, the present specimen differs so strongly from specimens of other species of the genus *Syarinus* that, in order to record this form for New Mexico, there appears to be no recourse other than erection of a new species. Future collecting will certainly provide additional specimens for study.

*Syarinus honestus* is readily separated from other species of the genus by the much more slender palpal podomeres. The granulate surface of the palpal femur indicates relationship to *S. granulatus*.

RECORD: This species is known from a single individual, the male holotype, taken by means of Berlese funnels from aspen litter secured at 10,250 feet elevation near the Santa Fe ski area, northeast of Santa Fe, Santa Fe County, New Mexico.

*Syarinus granulatus* Chamberlin

Figure 10

*Syarinus granulatus* CHAMBERLIN, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 39; 1931, Stanford Univ. Publ., Biol. Sci., vol. 7, figs. 9E, 11V, 13M, 15G, 16J, 17N, 28N, 36A.

The present records from New Mexico apparently are the first records for this species since the original description by Chamberlin (1930) based



on specimens taken in soil and litter beneath Douglas fir trees, Engleman Canyon, Manitou, Colorado. Because the original description was based on a limited number of specimens from a single locality and it is desirable to record ranges of measurements and ratios, it seems advisable to include here some structural details and measurements of our New Mexico specimens.

**MALE:** Our single male individual agrees very closely with the holotype male kindly lent me by J. C. Chamberlin. To show the very close agreement between our one male and the holotype, I have taken the liberty of giving my measurements of the palpal podomeres of the holotype in parentheses following corresponding measurements of the single New Mexico male.

Body of our male fairly stout, light golden yellow in color; palpi moderately stout, of deep golden color; legs light in color and fairly stout; body length 2.3 mm., with the abdomen possibly somewhat contracted. Carapace as pictured by Chamberlin (1931, fig. 9E); one weakly developed eyespot on each side, removed from the anterior border by a distance slightly greater than the diameter of the eyespot; surface of carapace smooth; posterior margin with 11 marginal setae; carapace widest across the posterior margin; carapace 0.70 mm. long, 0.76 mm. wide, ocular width 0.60 mm. Abdomen weakly ovate in general shape; tergites with 14 to 18 setae in the central part of the abdomen; each sternite with about 20 setae along the posterior and lateral margins in the central part of the abdomen; abdomen with greatest width 0.90 mm., but probably spread somewhat by mounting. Chelicera with exception of galea much as figured by Chamberlin (1931, figs. 13M, 17N); basal portion of movable finger and hand at base of fixed finger with net-like markings; main ramus of galea long, slender, and not extending beyond the level of the end of the apical tooth; galea with a secondary ramus arising from the base and not extending beyond the midpoint of the galea; chelicera 0.35 mm. long, 0.225 mm. wide; movable finger 0.31 mm. long. Palpus of male smooth except for a few weak granules on the extensor and flexor surfaces of the trochanter, well-developed and conspicuous granules throughout the flexor surface of the femur, and granules on a small area of the flexor surface of the hand just proximal to the finger base; shape of palpal podomeres as figured by Chamberlin (1931, fig. 28N) except that the chelal hand in dorsal view is more slender and subcylindrical. Trochanter 0.52 (0.51) mm. long, 0.20 (0.20) mm. wide; femur 0.77 (0.76) mm. long, 0.23 (0.225) mm. wide; tibia 0.73 (0.71) mm. long, 0.26 (0.255) mm. wide; chela 1.24 (1.20) mm. long without pedicel, 0.365 (0.35) mm. wide; hand 0.68 (0.665) mm. long, 0.36 (0.335) mm. deep; movable finger 0.59 (0.57) mm. long. From the side,

hand of chela is subcylindrical; pedicel nearly at the center of the base; dorsal margin slightly more convex than the ventral margin; hand narrowed little towards the finger base; three or four long pseudotactile setae in the basal half of the hand; fixed finger stout and nearly straight, with 40 obtusely pointed teeth along nearly the entire finger margin; movable finger gently curved, with little more than 50 teeth along the margin; tactile setae much as in the female (fig. 10). Legs fairly stout; surface smooth; setae long and acuminate, not especially abundant except on the tarsal segments. First leg with podomeres shaped as shown by Chamberlin (1931, fig. 43T) for *S. obscurus* except that the flexor surface of the pars basalis is evenly and distinctly convex and the extensor surface is gently concave; trochanter 0.157 mm. in length, with depth of 0.112 mm.; pars basalis 0.227 mm. long as measured along the extensor margin, depth 0.131 mm.; pars tibialis with both margins nearly straight and parallel, length along the extensor margin 0.239 mm., depth 0.135 mm.; tibia 0.322 mm. long, 0.100 mm. deep; both parts of the tarsus subcylindrical; metatarsus 0.127 mm. long, 0.077 mm. deep; telotarsus 0.191 mm. long, 0.075 mm. deep. Fourth leg with shape of podomeres much as indicated for *S. obscurus* by Chamberlin (1931, fig. 43S), but the extensor margin of the pars basalis is flattened except at the ends and the tibia, which bears a tactile seta, has basally and centrally a nearly straight extensor margin; trochanter 0.255 mm. long, 0.131 mm. deep; pars basalis 0.239 mm. long as measured along the flexor margin, 0.168 mm. deep; pars tibialis 0.455 mm. long, 0.193 mm. deep; entire femur 0.60 mm. long; tibia 0.445 mm. long, 0.120 mm. deep, with a very long tactile seta inserted on the extensor margin 0.151 mm. from the proximal end of the margin; metatarsus 0.155 mm. long, 0.095 mm. deep, a tactile seta inserted on the subextensor surface 0.048 mm. from the proximal margin; telotarsus cylindrical in outline, 0.239 mm. long, 0.088 mm. deep, with no indication of a tactile seta.

External genitalia of male little sclerotic; anterior operculum with 17 setae in an irregular uniseriate row just anterior to the aperture and with about 15 setae irregularly scattered anterior to the row; posterior operculum with about 30 setae (including those associated with the spiracles) in a somewhat irregular uniseriate row.

FEMALE: The measurements and ratios given here are expressed as ranges based on the five available New Mexico specimens. In parentheses following the ranges, I have taken the liberty of giving my own measurements and ratios of the corresponding structures in the female allotype borrowed from J. C. Chamberlin. The female is very similar to the male in general appearance, size, and chaetotaxy; body length 2.35–3.3 (2.9)

mm., the excessive variation in body length being caused by varying degrees of contraction or expansion of the abdomen in the mounted individual. Carapace like that of the male; 0.67–0.74 (0.66) mm. long, 0.72–0.80 (0.66) mm. across the posterior margin, ocular breadth 0.60–0.66 (0.53) mm. Chelicera essentially like that of the male except for characteristics associated with the movable finger; about 15 retroconical teeth along the margin of the fixed finger; marginal teeth of movable finger with usually 10 to 15 acute, slender, and conical teeth confined to nearly the distal two-fifths of the finger margin; the galea is divided subbasally into three stout rami, each of which is subterminally divided to form between two and four weak branches, each ramus extending by at least one-half of its length beyond the level of the apical tooth of the finger; chelicera of one female measures 0.34 mm. in length, 0.22 mm. in width, and has a movable finger 0.30 mm. in length. The palp of the female is essentially like that of the male; trochanter 0.51–0.54 (0.46) mm. long, 0.19–0.21 (0.19) mm. wide, length 2.5 to 2.7 (2.42) times the width; femur 0.77–0.81 (0.68) mm. long, 0.23–0.25 (0.22) mm. wide, length 3.1–3.35 (3.1) times the width; tibia 0.70–0.75 (0.65) mm. long, 0.24–0.265 (0.23) mm. wide, length 2.75–2.95 (2.83) times the width; chela 1.17–1.24 (1.07) mm. in length, 0.33–0.38 (0.31) mm. in width, length 3.2–3.55 (3.46) times the width; length of chelal hand 0.64–0.66 (0.57) mm., depth of hand very little less than the width of the hand; length of movable finger 0.58–0.62 (0.54) mm. Legs of the female like those of the male. External genitalia of female with setae of posterior operculum much as in the male, but with fewer setae on the anterior operculum, there being about 20 widely scattered setae without indication of arrangement into a row.

REMARKS: The galea of the male in this species appears somewhat variable. The galea of each chelicera of our single male from New Mexico has a short ramus arising from the very base of the galea. In contrast, one of the chelicera of the male holotype has a galea with two apparent short subbasal branches, while the other chelicera of the holotype has a galea with a submedial branch as figured by Chamberlin (1931, fig. 17N). The observed variation in the branching of the galea of the male is probably related to development, as the galea of the male is formed by reduction or loss of branching from the complexly branched galea of the tritonymph, which has a galea similar to that of the female. In the females of this species there is considerable variation in the contour of the chelal hand and in the length/width ratio of the chela. The present species is easily separated from other species of *Syarinus* by reference to the key.

RECORDS: *Bernalillo County*: Four collections from the Sandia Moun-

tains, just east of Albuquerque; two females, one tritonymph, and two deutonymphs from aspen litter in Tejano Canyon, north exposure, 8300 feet elevation; one male from aspen litter taken along the road to the crest, about 9500 feet elevation; a single female taken in two different collections from mixed aspen and fir litter collected near the crest, elevation about 10,600 feet. *San Miguel County*: One female from alder litter taken near a stream, just west of Cowles, at an elevation of 8400 feet. *Valencia County*: One nymph, unaccompanied by adults, from aspen litter mixed with a few yellow-pine needles along the road from Grants to La Mosca fire lookout, Mt. Taylor, at an elevation of 9200 feet.

*Syarinus granulatus* obviously prefers somewhat moist deciduous tree litter, even when the litter is mixed to some extent with conifer needles. This microhabitat specificity probably accounts for restriction of the species to elevations between 8000 and 11,000 feet.

#### SUBFAMILY CHITRELLINAE BEIER

The subfamily Chitrellinae was established by Beier (1932) to replace the subfamily name Chitrinae (Chamberlin, 1930), a name based on the preoccupied genus *Chitra* Chamberlin, 1930. Forms belonging to this subfamily have no more than a slightly oblique articulation between the pars basalis and the pars tibialis of the third and fourth legs, almost always have denticulate subterminal tarsal setae, and usually lack a galea. If a galea is present, it is never branched and by its insertion does not interrupt the contour of the outer margin of the movable cheliceral finger. A limited number of species have been assigned to less than a dozen genera. Up to the present time the subfamily has been reported only from the West Indies, Central America, Mexico, California, and Europe. All European forms are troglodytes. A single genus and species is reported here from New Mexico.

#### CHITRELLA BEIER

*Chitrella* BEIER, 1932, Das Tierreich, vol. 57, p. 165, to replace *Chitra* Chamberlin, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 40, name preoccupied.

The members of this genus are separated from those of other genera by characteristics associated with the tactile setae of the chelal fingers: *t*, *st*, and *sb* not forming a series of closely placed setae, but normally distributed and with the areoles of *sb* and *st* separated by at least three areolar diameters; *ib* located on the dorsal distal part of the hand, *esb* and *eb* located at the base of the finger and about median between the levels of *isb* and *ib*; *ist* submedian on the finger and more than two

areolar diameters proximal to *est*. In addition to the single species, *C. cala* (Chamberlin, 1930), previously assigned to this genus, it is evident that *Obisium transversum* Banks, 1909, also belongs here. Of the two species, *cala* is known only from California (Chamberlin, 1930), and *transversa* is known only from New Mexico.

*Chitrella transversa* (Banks), new combination

Figures 11–12

*Obisium transversum* BANKS, 1909, Canadian Ent., vol. 41, p. 307.

*Microcreagris transversa*, BEIER, 1932, Das Tierreich, vol. 57, p. 157.

The modern generic assignment of *Obisium transversum* has long been in doubt because pertinent and necessary details are not given in the original species description. Apparently most investigators, including J. C. Chamberlin, have not attempted a generic placement of this species. Without an explanation or reason, however, Beier (1932) assigns this species to the genus *Microcreagris*, where, because of the absence of a galea, the form obviously does not belong. The error made by Beier may have resulted from confusion relative to the term "stylet" as applied by Banks to the structure now called the galea.

Specimens reported here as *C. transversa* and collected from the edge of Glorieta Mesa just southeast of Rowe and within no more than 10 miles of the village of Pecos (the type locality of *transversum*) agree in virtually every detail with the description given by Banks (1909). The only discrepancy lies in the much less slender carapace of our present specimens. This difference may result from the study by Banks of specimens preserved in alcohol, while the present specimens have been treated with potassium hydroxide and mounted in Canada balsam. Beyond any serious doubt, the present New Mexico specimens are conspecific with the *Obisium transversum* of Banks. Absolute verification of this will come, however, only by examination of the single type specimen in the collections of the Museum of Comparative Zoölogy at Harvard College.

Because the description given by Banks indicates so well the shape of palpal podomeres, and there may be some general interest in an example of the type of description employed by Banks, it seems appropriate to quote *verbatim* the original description of *Obisium transversum*:

"*Obisium transversum*, n. sp.—Pale yellowish on the cephalothorax and palpi, rest of body and the legs paler. Cephalothorax one and a half times as long as broad, surface smooth, slightly narrowed in front of eyes, the front margin slightly convex; behind the middle is a distinct transverse furrow, with its ends slightly curving forward, two distinct eyes

each side; mandibles large, more than one-half as long as the cephalothorax, no stylet. Femur of palpus hardly as long as the cephalothorax, barely broader in the middle; tibia a little shorter than the femur, but broader, outer side near base is slightly concave, inner side rather suddenly swollen and then nearly straight; claw as long as cephalothorax plus mandibles, about twice as broad as femur, the hand very broad near base, tapering each side to the fingers, which are stout, slightly curved and as long as hand; all with fine simple hairs, many of them very long. Legs short, with simple hairs, anterior tips of coxae i and ii with a distinct tooth. Abdomen (♀) about two and a half times as long as cephalothorax; the segments smooth.

"Length, 2 mm.

"From Pecos, New Mexico (Cockerell)" (Banks, 1909, p. 307).

In order to aid in future work in this group, it seems advisable to supplement Banks's description, particularly with measurements and ratios of palpal podomeres. Study of our present specimens indicates that the carapace of both male and female has very weakly convex lateral margins; carapacial surface smooth except for net-like lines on the lateral surfaces; the transverse furrow mentioned by Banks in his original description appears to be a thickened supporting or reinforcing band of exoskeletal material rather than a definite well-marked suture or furrow; posterior margin of carapace with six to eight setae, anterior margin invariably with six setae. The chelicera has 10 to 16 retroconical teeth, often irregular in size, along the distal two-thirds of the margin of the fixed finger and five to nine conical teeth, very irregular in size, along the distal one-half to one-third of the margin of the movable finger. Palpi similar in the two sexes; tactile setae as shown in figures 11 and 12.

Ranges of measurements of the four available males are given here. Body length 2.2–2.75 mm.; carapace 0.59–0.69 mm. long, 0.47–0.54 mm. wide; ocular width of carapace 0.42–0.48 mm. Palpus with trochanter 0.31–0.35 mm. long, 0.15–0.17 mm. wide, length 1.95–2.13 times the width; femur 0.53–0.62 mm. long, 0.14–0.17 mm. wide, length 3.5–3.8 times the width; tibia 0.44–0.54 mm. in length, 0.18–0.225 mm. in width, length 2.4–2.6 times the width; chela 0.78–0.93 mm. long, 0.255–0.31 mm. wide, length 2.9–3.35 times the width; chelal hand 0.36–0.44 mm. long, 0.255–0.31 mm. deep; movable chelal finger 0.47–0.52 mm. long.

In addition to the measurements of the male, it appears advisable to give the measurements of our three females from New Mexico: body length 2.5–3.15 mm.; carapace 0.62–0.74 mm. long, 0.52–0.60 mm. wide; ocular width 0.46–0.52 mm.; movable finger of chelicera 0.23–0.26 mm. in length; palpus with trochanter 0.34–0.37 mm. long, 0.16–0.18 mm.

wide, length 2.0–2.15 times the width; femur 0.59–0.62 mm. long, 0.16–0.175 mm. wide, length 3.55–3.7 times the width; tibia 0.48–0.53 mm. long, 0.21–0.235 mm. wide, length 2.2–2.3 times the width; chela 0.91–1.00 mm. in length, 0.29–0.335 mm. in width, length 2.8–3.15 times the width; chelal hand 0.42–0.45 mm. in length, 0.29–0.32 mm. in depth; movable chelal finger 0.53–0.57 mm. long.

When the writer first studied in detail the present New Mexico specimens, he gave serious consideration to the possibility that *Chitra cala* Chamberlin, 1930, was a synonym of *Obisium transversum* Banks, 1909. Supporting this view was the close agreement between details of our specimens and those mentioned in the abbreviated original description by Chamberlin (1930) for *Chitra cala*. In addition, our specimens agree well with various figures given by Chamberlin (1931, figs. 13K, 17O, 33P, 36C, 40R, 43L, M) for his *Chitra cala*. Certain details of our specimens, however, are not in full accord with other figures published by Chamberlin (1931, figs. 47Z, 57) for his species, which introduced some doubt into the possible synonymy of *cala* and *transversa*. The difficulty was solved through the kindness of J. C. Chamberlin, who examined some of our New Mexico specimens and reported that beyond all doubt his *cala* is a species separate and distinct from *transversa*. In addition, J. C. Chamberlin has generously supplied unpublished information relative to the holotype of *C. cala* and has indicated (*in litt.*) the more distinctive differences between the two species.

By a comparison of specimens of *C. transversa* with information available on the holotype male of *C. cala*, it becomes clear that for males the most satisfactory manner of separating the two species is the complete absence in *C. transversa* of the discal sensory structure of the sixth sternite and the inability of the medial group of small setae of the fifth sternite to break the regular contour of the posterior margin of the sternite. The sensory structure of the sixth sternite and the emarginate posterior border of the fifth sternite of *C. cala* are clearly shown by Chamberlin (1931, figs. 47Z, 57). In addition to these differences, the eyes are larger and much more strongly defined in *C. transversa*. Attempts to find significant differences in the palpal podomeres have not been particularly successful, for the measurements and ratios of the palpal podomeres for the holotype of *C. cala* fall almost without exception within the imperfectly known ranges of our four New Mexico males of the species *transversa*. Present measurements indicate, however, that the tibia of the holotype of *C. cala* is a little stouter, the chela very slightly longer, and the movable chelal finger appreciably longer than in our specimens of *C. transversa*. At present, little confidence can be placed in

these differences, because they may well be the result of inadequate study collections. It is worthy of note, however, that in a comparison of our specimens with the figure given by Chamberlin (1931, fig. 57) for *C. cala*, differences in the shape of the tibia and the relative length of the chelal finger appear to substantiate the differences suggested by our measurements. For instance, the chelal hand of *C. cala* in dorsal view appears less oval in outline, and the fingers appear more slender and relatively much longer, than in *C. transversa*. Also in our present specimens the distal one-half of the tibia is more cylindrical than in *C. cala* and the flexor margin of the tibia is nearly straight beyond the midpoint, while in *C. cala* the flexor margin of the tibia is centrally much more evenly convex. If these differences are real and not the result of a lack of suitable series of individuals of the species under consideration, it may be possible to separate males of the two species without reference to the specialized structure of the fifth and sixth sternites. In the absence of detailed information relative to the females of *C. cala*, it is impossible to suggest methods of separation from *C. transversa*, but, in view of the limited degree of sexual dimorphism exhibited in the palpi of these pseudoscorpions, it may be practical to separate both males and females of *C. cala* from those of *C. transversa* on the basis of differences in the shape of the palpal tibia and chela.

RECORDS: *Bernalillo County*: From juniper litter on a dry hillside, Cedro Canyon, Manzano Mountains, southeast of Albuquerque, at 7000 feet elevation. *Lincoln County*: From Gambel-oak litter, foothill zone on the south side of Gallinas Peak, west of Corona, elevation about 7500 feet. *Rio Arriba County*: From Gambel-oak litter, south of Cebolla and north of Echo Amphitheater picnic area, elevation 7250 feet. *Sandoval County*: East of Cuba, between the Nacimiento and San Pedro Mountains, from dry yellow-pine litter at 8400 feet elevation; extreme southeast corner of the county, between San Antonito and San Pedro, from juniper litter at 6400 feet elevation. *San Miguel County*: From juniper litter, north edge of Glorieta Mesa near Rowe, elevation 7600 feet; south of Villanueva, from scrub-oak litter at 6400 feet elevation. *Santa Fe County*: From Gambel-oak litter mixed with some yellow-pine needles, 9 miles northeast of Santa Fe, 8150 feet elevation. *Socorro County*: Water Canyon, west of Socorro, from alder litter at 7000 feet elevation. Within the limits of our collections this species is restricted to an altitudinal band between 6400 and 8400 feet. At this level occur junipers, pinyons, Gambel and other types of oak, and yellow pine. *Chitrella transversa* is a litter-inhabiting species, preferring juniper and deciduous tree litter but distinctly avoiding pinyon litter. The absence of this species from pinyon litter is somewhat peculiar because pinyons, junipers, and oaks often occur in mixed stands.



## FAMILY IDEORONCIDAE CHAMBERLIN

In this family the venom apparatus is equally well developed in both the fixed and movable chelal fingers, and the pleural membrane of the abdomen is smoothly and regularly striate. Two subfamilies are recognized, the Bochicinae and the Ideoroncinae. The subfamily Bochicinae is confined to the West Indies and South America. The Ideoroncinae have been reported from North and South America, Africa, and the Orient.

## SUBFAMILY IDEORONCINAE CHAMBERLIN

Pseudoscorpions of this subfamily have more than the usual 12 tactile setae on the chela, with some of the setae located on the dorsum of the hand. The subfamily contains seven genera, of which only one, *Albiorix*, is known from the United States.

*ALBIORIX* CHAMBERLIN

*Albiorix* CHAMBERLIN, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 44.

Pseudoscorpions belonging to this genus can be recognized by the following combination of characters: four tactile setae on the dorsum of the chelal hand arranged in a compact group, with the distance between the two exterior setae distinctly less than the basal width of the movable finger; tergites of abdomen not divided; arolium of each leg bifid and about twice as long as the tarsal claws. The genus contains seven species and has been reported up to now only from California, Utah, and Mexico. Species of the genus appear to be characteristically, though not invariably, found beneath stones in arid areas.

*Albiorix retrodentatus* Hoff

*Albiorix retrodentatus* HOFF, 1945, Amer. Mus. Novitates, no. 1277, p. 6.

With one exception, the two available males from New Mexico agree perfectly with the original and only description (Hoff, 1945) of the species. The only critical difference is in the depth of the pars basalis and femur of the fourth leg. In our New Mexico specimens this depth is 0.20 mm. in one specimen and 0.225 mm. in the other, while the depth is recorded by Hoff (1945) as 0.26–0.28 mm. (actually, 0.28 mm. for the holotype and 0.26 mm. for the paratype from Guerrero, Mexico). It is possible that the measurements were incorrectly made, the ocular micrometer having been read with an error of five units. This would easily explain the difference between our present specimens and the types. A reexamination should be made of the type specimens in the collections of the American Museum of Natural History.

Because the original description of this species is based on only two male specimens, it seems advisable to give critical measurements of our two New Mexico males. The measurements given here for one male are followed in parentheses by measurements of the second male, except when an unfavorable position or the damaged nature of the second male precludes accurate measurement. Unfortunately females of this species have never been collected. Body length 2.6 (2.15) mm.; carapace 0.76 (0.69) mm. long, greatest width 0.58 mm., ocular breadth 0.47 (0.40) mm. Palpal trochanter 0.37 (0.34) mm. long, 0.165 (0.145) mm. wide; femur 0.785 (0.69) mm. long, 0.195 (0.175) mm. wide; tibia 0.66 mm. long, 0.215 (0.19) mm. wide; chela 1.24 mm. long, 0.37 mm. wide; chelal hand 0.66 mm. long, depth—(0.28) mm.; movable finger 0.71 mm. long. First leg with tibia 0.295 (0.247) mm. long, 0.068 (0.061) mm. deep; fourth leg with entire femur 0.56 (0.62) mm. long, 0.20 (0.225) mm. deep; tibia of fourth leg 0.44 (0.40) mm. long, 0.099 (0.093) mm. deep.

RECORDS: *Eddy County*: One male from White City, about 3500 feet elevation, and one male from 16 miles south of Artesia, elevation probably a little under 3500 feet. Up to the present, this species has been recorded only from the type locality, Mexcala, Guerrero, Mexico.

#### SUPERFAMILY GARYPOIDEA CHAMBERLIN

Pseudoscorpions belonging to this superfamily can be recognized by the presence of a single subapical lobe (rarely subdivided to form two or three weakly developed teeth) instead of a row of teeth on the inner margin of the movable cheliceral finger, the fusion at least basally of the plates of the serrula interior to form a membranous sheet, and the consistently simple and acute subterminal setae of the pedal tarsi. The superfamily contains three families, of which two, the Olpiidae and the Garypidae, are cosmopolitan in distribution and are represented in the New Mexico fauna. The other family, Menthiidae, contains a single small genus, *Menthus* Chamberlin, and is confined geographically to the arid regions of Mexico and the southwestern part of the United States. The genus is not known from New Mexico.

#### FAMILY OLPIIDAE CHAMBERLIN

This family contains pseudoscorpions that have a venom apparatus in both fixed and movable fingers, a smoothly and evenly plicate pleural membrane, a carapace that is rarely triangular in general outline, a coxal area that is never widened posteriorly, and palpal and tergal setae that are always acute, slender, and usually conspicuous. The family is divided into

two subfamilies, Garypininae and Olpiinae. Both subfamilies are cosmopolitan in distribution. The New Mexico fauna is represented by two, possibly three, genera of the subfamily Garypininae. The subfamily Olpiinae has not been found in New Mexico, in spite of the fact that representatives are reported from Mexico, California, Florida, and the West Indies.

#### SUBFAMILY GARYPININAE DADAY

Pseudoscorpions belonging to this subfamily are characterized by having bifurcate arolia, by having at least some of the tergites and sternites divided into scuta, and by having a flagellum of four blades, of which one may rarely be reduced. In addition to the eight genera previously assigned to this subfamily, a ninth is described here as new to the literature. The Garypininae are represented in New Mexico by two species of *Serianus* and one species assigned to the new genus *Neoamblyolpium*. As *Pseudogarypinus marianae* (Chamberlin, 1930) occurs in Utah and California, it will probably be found in New Mexico. Indeed, if our assumptions as given below are correct, the species has already been reported from New Mexico under the designation of *Olpium frontalis* Banks, 1909.

#### NEOAMBLYOLPIUM, NEW GENUS

DIAGNOSIS: With characteristics of the family Olpiidae and the subfamily Garypininae; chelicera with galea subterminally trifid; weakly developed lamina exterior; except at the distal end of the row, the marginal teeth of the fixed chelal finger are progressively reduced but still retain cusps; marginal teeth of the movable chelal finger much more reduced and, except for a few distally placed teeth, are vestigial and acuspid; tactile seta *it* of fixed chelal finger at the level of *est* or definitely distal to the level of *est*, near the midpoint or just distal to the midpoint of the finger, and very far removed from the level of *esb*; tactile seta *ist* of fixed finger usually much closer to the level of *isb* than to *it*; tactile seta *ib* located on the dorsal surface of the chelal hand just proximal to the finger base and conspicuously and definitely proximal to the level of tactile seta *eb*; movable chelal finger with tactile seta *t* located within the basal half of the finger; *st* about two-fifths of the finger length from the proximal finger margin, no more than three areolar diameters proximal to *t*, and four or more times as far removed from *sb* as from *t*; both *sb* and *h* located well within the basal one-fifth of the movable finger; nearly all sternites and tergites divided; pars tibialis of first leg very much shorter than the pars basalis; femur of fourth leg at least two and

one-half times longer than deep. The genus contains a single species, the type of the genus.

TYPE SPECIES: *Neoamblyolpium alienum*, new genus and new species.

REMARKS: The new genus, with the genera *Amblyolpium* Simon, *Pseudogarypinus* Beier, and *Neominniza* Beier, forms a group (perhaps of tribal level, but not yet designated in the literature) characterized by having the pars tibialis of the first leg much shorter than the pars basalis, the two parts being separated by a partially mobile articulation. Other genera of the subfamily Garypininae are characterized by having the pars tibialis of the first leg definitely longer than the pars basalis, with the articulation between the femoral parts virtually fixed. Our new genus seems to be most closely related to *Amblyolpium*, for both are characterized by having the teeth of the movable chelal finger much more reduced than those of the opposing finger and by having *isb* of the fixed chelal finger much closer to *ist* than to *ib*. In *Pseudogarypinus* and *Neominniza* the teeth of the chelal fingers are of equal development, and *isb* is much closer to *ib* than to *ist*. *Neoamblyolpium* can be separated without difficulty from *Amblyolpium* by the more basal position of tactile seta *ib* of the fixed chelal finger, by the more slender femur of the fourth leg, and by the presence of the weakly developed lamina exterior, which according to Beier (1932) is wanting in *Amblyolpium*. In our new genus the tactile seta *ib* is located on the dorsal surface of the hand proximal to the finger base and notably proximal to the level of *esb*, while in *Amblyolpium*, *ib* is on virtually the same level as *esb*. In *Neoamblyolpium* the fourth pedal femur has a length/depth ratio very little greater than 2.5, while in *Amblyolpium* the fourth pedal femur is little more than twice as long as deep.

*Neoamblyolpium alienum*, new genus and new species

Figures 13–15

MALE: Description of the male is based on the holotype and four paratypes. Measurements and ratios given for the holotype frequently are followed in parentheses by ranges of corresponding measurements and ratios of all five type specimens. Body fairly stout; abdomen moderately deep yellow in color, carapace and palpi but little darker, legs somewhat lighter in color; body length 2.05 (1.8–2.05) mm. Carapace with surface smooth; sclerotic area not extending to the posterior border; setae sparse and fairly inconspicuous; posterior margin nearly straight, anterior margin between the eyes weakly convex and with four marginal setae; lateral margins weakly convex, especially in the anterior half; two well-

developed eyes on each side, anterior eye removed from the anterior carapacial margin by less than the diameter of the eye, the two eyes approximate; carapace 0.55 (0.50–0.55) mm. long, posterior width 0.57 (0.46–0.57) mm. (probably appreciably less in unmounted specimens); ocular width 0.29 (0.27–0.29) mm., width across the posterior margin almost three times the width at the anterior margin. Abdomen with all tergites except the first and eleventh divided; tergites of central part of abdomen with about four very fine setae on each tergal half; sternites except the eleventh divided and with three to four fine setae along the margin of each sternal half; each sternal and tergal scutum of the tenth segment with two long pseudotactile setae in addition to the short marginal setae; undivided eleventh sternite with four, and tergite with two, long pseudotactile setae; each posterior stigmatic plate with two (occasionally one or three) setae, anterior plate usually devoid of setae but sometimes with one seta; lateral margins of abdomen convex, abdomen about 0.8 mm. in width.

Chelicera light yellow in color, fairly stout; apparently smooth except for weakly developed, net-like sculpturing on the outer surface of the hand near the base of the movable finger; flagellum consisting of four setae; fixed finger well curved and usually with three conical teeth along the distal third of the margin and one or two small denticles on the inner margin of the apical finger; lamina exterior very weakly developed; movable finger gently curved, subterminal lobe very poorly developed, apical tooth bicuspid; galea relatively long, heavy, and terminally trifid; galeal seta not extending nearly to the level of the end of the galea; base of hand with five setae (one chelicera of holotype with only four, *b* or *sb* wanting), with *is* and *ls* very long and with each of the three other setae little more than one-half of the length of *is*, *ls* located a considerable distance proximal to the level of *is* and actually about midway between the levels of *is* and *sb* (an alternate interpretation is that *ls* is wanting and that a supernumerary seta has been inserted between seta *b* and seta *es*); chelicera 0.15 mm. long, base 0.09 mm. wide, movable finger 0.115 (0.112–0.119) mm. in length.

Palpus moderately stout except for the long slender fingers; palpi moderately golden yellow in color; setae sparse, fairly long, and delicate; no indication of sculpturing or the presence of granules. Trochanter with extensor margin very weakly concave; flexor margin convex in the center and nearly straight or at least more weakly convex beyond; length 0.222 (0.205–0.222) mm., width 0.10 (0.097–0.102) mm., length 2.22 (2.05–2.22) times the width. Femur with weakly differentiated pedicel; extensor margin nearly straight except at the ends; flexor margin gently

convex throughout nearly the entire length; greatest width near the distal third; 0.455 (0.41–0.455) mm. long, 0.12 (0.11–0.12) mm. wide, length 3.8 (3.7–4.0) times the width. Tibia with extensor margin almost uniformly convex; pedicel about as long as wide; flexor margin distal to the pedicel gently convex; length 0.32 (0.29–0.32) mm., width 0.125 (0.11–0.125) mm., length about 2.55 (2.45–2.7) times the width. Chela with pedicel wider than long and displaced towards the extensor surface; extensor margin of hand gently and evenly convex except along the proximal portion, juncture of extensor margin and pedicel moderately angular; flexor margin moderately convex except strongly convex in the basal half where the hand is swollen; juncture of flexor margin and pedicel gently curved; fingers slender, much longer than the hand, and gently curved; chela 0.78 (0.71–0.78) mm. long, 0.22 (0.20–0.22) mm. wide, length 3.55 (3.5–3.65) times the width. In lateral view the chelal hand is deepest just proximal to the center; ventral margin distally straight to very weakly convex, becoming moderately convex in the proximal third and meeting the pedicel in an angular manner; dorsal margin more convex and rounded than the ventral margin and forming with the pedicel a somewhat angular juncture; pedicel displaced a little towards the ventral side in some specimens, but near the center of the base of the hand in other specimens; fixed finger virtually straight, with about 30 teeth ranging from conical and acute at the distal end of the row to distinctly flattened and retroconical at the other end of the row, all teeth except the most proximal one or two bear cusps; movable finger a little more slender than the fixed finger and slightly curved, 20 to 25 teeth along the margin, the teeth ranging from acute and conical at the distal end of the row to very strongly vestigial in the proximal end of the row, with cusps only on the distal seven to nine teeth, teeth of the central part of the row very strongly flattened and acuspid; tactile setae of chelal fingers as shown in figures 14 and 15; length of hand 0.33 (0.30–0.33) mm., depth of hand 0.20 (0.19–0.20) mm., length of movable finger 0.45 (0.41–0.45) mm.

Legs moderately slender except for the femur and trochanter of the third and fourth legs; setae sparse and delicate, more numerous on the tarsal segments of the fourth leg; surface smooth. First leg with trochanter subtriangular in shape and with a conspicuously convex flexor margin, length 0.104 mm., depth 0.088 mm.; pars basalis with extensor margin very weakly concave, flexor margin very weakly convex to nearly straight, greatest depth at the distal end, length as measured along the extensor margin 0.219 mm., depth 0.076 mm.; pars tibialis little more than one-half as long as the pars basalis, extensor margin evenly and gently con-

vex, length along the extensor margin 0.118 mm., depth 0.069 mm.; tibia with flexor margin gently convex, extensor margin very weakly concave to straight except for the proximal portion of the margin, greatest depth in the distal one-third, length 0.179 mm., depth 0.052 mm.; metatarsus subcylindrical, flexor margin very weakly convex, length 0.111 mm., depth 0.04 mm.; telotarsus deepest near the proximal end and gradually becoming less deep towards the distal end, length 0.155 mm., depth 0.032 mm.; arolium bifurcated near the level of the end of the tarsal claws, with each branch as long as the common basal portion. Fourth leg with trochanter subcylindrical, 0.151 mm. long, 0.087 mm. deep; pars basalis with flexor margin nearly straight in the distal two-thirds but proximally convex, length as measured along the flexor margin 0.159 mm., depth 0.107 mm.; pars tibialis with flexor margin weakly convex, extensor margin very much arched and regularly convex except for increasing convexity towards the proximal end of the margin, greatest length 0.318 mm., depth 0.153 mm.; entire femur 0.41 (0.38–0.41) mm. long, 0.153 (0.147–0.153) mm. deep, length 2.68 (2.53–2.68) times the depth; tibia with conspicuously convex flexor margin, extensor margin nearly straight in the distal one-half but weakly convex proximally, greatest depth near the distal one-third, length 0.290 mm., depth 0.080 mm., a relatively short pseudotactile seta located on the extensor surface about 0.092 mm. from the proximal margin; metatarsus subcylindrical, 0.143 mm. long, 0.052 mm. deep, with a long tactile seta located on the extensor margin 0.020 mm. from the proximal margin; telotarsus subcylindrical, 0.183 mm. long, 0.040 mm. deep.

External genitalia characterized by the presence of a row of nine to 14 setae on the anterior operculum just anterior to the aperture; posterior operculum with six or seven setae in a marginal row along the posterior edge of the central portion of the operculum and with a medial row of four to seven setae on anterior edge of the operculum just posterior to the aperture.

FEMALES: The description of the female is based on the allotype and four paratypes. In many instances the measurements and ratios given for the allotype are followed in parentheses by the ranges for all five females. In all respects except external genitalia the female is very similar to the male; body length 2.2 (2.15–2.4) mm.; carapace 0.52 (0.52–0.55) mm. long, greatest width 0.43 (0.43–0.55) mm. and probably much greater in some instances than in the unmounted specimen, ocular width 0.27 (0.27–0.30) mm. Chelicera with movable finger 0.115 (0.112–0.119) mm. in length. Palpus not exhibiting sexual dimorphism; trochanter 0.22 (0.215–0.22) mm. long, 0.105 (0.100–0.107) mm. wide, length 2.09

(2.01–2.15) times the width; femur 0.45 (0.40–0.46) mm. long, 0.12 (0.105–0.12) mm. wide, length 3.75 (3.65–3.9) times the width; tibia 0.32 (0.285–0.32) mm. long, 0.127 (0.115–0.127) mm. wide, length 2.52 (2.46–2.56) times the width; chela 0.76 (0.71–0.76) mm. long, 0.23 (0.20–0.23) mm. wide, length 3.3 (3.3–3.55) times the width; chelal hand 0.33 (0.315–0.33) mm. long, 0.225 (0.189–0.225) mm. deep, with depth of hand very slightly less than the width of the hand; movable finger 0.44 (0.40–0.46) mm. long. First leg of allotype with trochanter 0.115 mm. long, 0.09 mm. deep; pars basalis 0.21 mm. long, 0.075 mm. deep; pars tibialis 0.112 mm. long, 0.070 mm. deep; tibia 0.175 mm. in length, 0.053 mm. in depth; metatarsus 0.10 mm. long, 0.040 mm. deep; telotarsus 0.14 mm. long, 0.036 mm. deep. Fourth leg of allotype with pars basalis 0.16 mm. long, 0.122 mm. deep; pars tibialis 0.318 mm. long, 0.163 mm. deep; entire femur 0.41 (range for five females 0.385–0.41) mm. long, depth 0.163 (range for five females 0.143–0.163) mm., length 2.52 (range for five females 2.52–2.72) times the depth; tibia 0.283 mm. long, 0.081 mm. deep, with pseudotactile seta located 0.088 mm. from the proximal margin; metatarsus 0.13 mm. long, 0.052 mm. deep, with the tactile seta located 0.016 mm. from the proximal margin; telotarsus 0.165 mm. in length, 0.040 mm. in depth. The external genitalia of the female are extremely simple, very weakly sclerotic, and difficult to delimit with respect to the opercula; anterior operculum with a row of 10 (six to 12) closely grouped setae flanking the aperture; the posterior operculum is characterized by a gently curved row of six widely spaced setae.

**NYMPHS:** Although specimens of all three nymphal stages are present in our collections, there appears to be no particular advantage in giving detailed descriptions at this time.

**RECORDS:** *Bernalillo County:* One deutonymph paratype from litter beneath a large isolated yellow-pine tree in a pinyon-juniper area, 4 miles northeast of Tijeras, at 6700 feet elevation. *Sandoval County:* One paratype female from mixed juniper and pinyon litter and one paratype male from juniper litter in the extreme southeast corner of the county, west of the village of San Pedro, at 6400–6600 feet elevation. *San Miguel County:* Two miles south of Villanueva, one paratype female and one paratype protonymph from litter in an open stand of junipers, 6600 feet. *Santa Fe County:* One paratype deutonymph from pinyon litter near Edgewood, at 6700 feet. *Torrance County:* The female allotype, two female paratypes, and one male paratype (and numerous adults of both sexes and nymphs as well in alcohol) from a clump of decaying yucca (*Yucca baccata* Torrey) and two male paratypes in dry juniper litter,



both in a pinyon-juniper area, 1 mile west of Mountainair, at 6800 feet elevation. *Valencia County*: The holotype male from pinyon litter taken at the south base of Mt. Taylor, near Grants, at 7500 feet elevation. All specimens presently available are designated as types, but the detailed measurements given in the species description have been taken from five mounted males and five mounted females. All specimens have been collected by the use of Berlese funnels and, except as indicated above, all are mounted in Canada balsam.

It is interesting to note that our collections are confined to a very narrow altitudinal band of 6400 to 7500 feet elevation. This species is litter inhabiting, occurring in juniper, pinyon, and yellow-pine litter, with exception of one collection from a clump of decaying yucca in a pinyon-juniper community. While one might reasonably expect this species to occur also in oak or other deciduous tree litter, we have not taken specimens from this source, although many Berlese samplings have been made of this kind of litter.

### *PSEUDOGARYPINUS* BEIER

*Pseudogarypinus* BEIER, 1931, Mitt. Zool. Mus. Berlin, vol. 17, p. 313.

This genus contains pseudoscorpions of the subfamily Garypininae and is characterized by the following combination: the pars tibialis of the first leg is distinctly shorter than the pars basalis, with the articulation between the femoral parts partially mobile; a lamina exterior is present on the fixed chelical finger and the galea is terminally branched; marginal teeth of the chelal fingers are equally well developed on both fingers; and tactile seta *ish* of the fixed finger is much closer to *ib* than to *ist*. Only two species have been assigned to the genus, *P. marianae* (= *Garypinus marianae* Chamberlin, 1930) from California and Utah and *P. costaricensis* Beier, 1931, from Costa Rica. The record of a single questionable species from New Mexico is discussed here.

#### *Pseudogarypinus frontalis* (Banks), new combination

*Olpium frontalis* BANKS, 1909, Canadian Ent., vol. 41, p. 307.

*Serianus frontalis*, BEIER, 1932, Das Tierreich, vol. 57, p. 213 (indicated as an uncertain assignment).

(?) *Garypinus marianae* CHAMBERLIN, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 591.

(?) *Pseudogarypinus marianae*, BEIER, 1932, Das Tierreich, vol. 57, p. 206.

As *Pseudogarypinus* has been reported from California and Utah, there is no reason to suppose that the genus will not be found in New Mexico. While the writer has not found representatives of *Pseudogary-*

*pinus* in New Mexico, there is a possibility that *Olpium frontalis* Banks, 1909, may belong to this genus. A careful study of the characters described by Banks for his *frontalis* and of all available information relative to the genus *Pseudogarypinus* (Chamberlin, 1930, 1931; Beier, 1931, 1932) strongly suggests the possible assignment of *frontalis* to *Pseudogarypinus*. In addition there is such a close agreement between the description of *Olpium frontalis* as given by Banks and that of *Garypinus marianae* as given by Chamberlin that the two may be synonymous. The close agreement between the two forms is evident in the body size, shape of the carapace, division of the tergites, shape and sculpturing of the palpal femur, and relative lengths of the palpal hand and fingers. On the other hand, the galea of *frontalis* is said to be simple, while the galeae of the two described species of *Pseudogarypinus* are terminally trifid. At the magnifications commonly used by Banks, it is entirely possible that he overlooked the terminal branching of the galea.

Until at least one of the two cotypes of *frontalis* deposited at the Museum of Comparative Zoölogy is examined, assignment of this species to the genus *Pseudogarypinus* appears logical. The exact relationships between *frontalis* and *marianae* can be established only by reëxamination of the types of *frontalis* and, indeed, perhaps only by comparison of the types of *frontalis* and the types of *marianae*.

RECORD: KNOWN only from the type locality, Las Vegas, New Mexico (Banks, 1909). Beier (1932) erroneously gives Mexico as the locality.

### SERIANUS CHAMBERLIN

*Serianus* CHAMBERLIN, 1930, Ann. Mag. Nat. Hist., ser. 10, vol. 5, p. 594.

The genus *Serianus* contains species of Garypininae characterized by having the femoral articulation of the first and second legs virtually immobile, and with the pars tibialis distinctly longer than the pars basalis; the movable chelal finger normally with four tactile setae, of which *sb* and *st* are closely paired and not grouped with *b*; setae *it* and *ist* of fixed finger closer to the level of *esb* than to the level of *est*; galea branched; some sternites of the central part of the abdomen of the male exhibiting a medial group of setae. The genus includes fewer than 10 species and is confined to the Gulf of California region of Mexico and California and to Argentina, with one record from Utah (Chamberlin, 1930). It is entirely possible that some South American species of *Serianus* should be re-assigned to the genus *Paraserianus* Beier, 1939. On the other hand, the variable number of tactile setae of the movable chelal finger in the Argentine *Serianus minutus* Hoff, 1950, tends to destroy the distinction be-

tween the genus *Serianus* and the genus *Paraserianus*, so that the latter ultimately may be relegated to a subgeneric level. In the present paper, one species of *Serianus* from New Mexico is described as new to the literature, and, in addition, mention is made of the possible occurrence of a second species in the state. The latter species is represented, however, by a single deutonymph and is neither named nor described here.

*Serianus dolosus*, new species

Figures 16-18

MALE: The description of the male is based on four individuals, the holotype and three paratypes. In the case of all measurements except those of the legs, the range for all four males is given in parentheses after the corresponding measurement of the holotype. With respect to the legs, measurements for the holotype are followed in parentheses by the corresponding measurements of the paratype taken from beneath a rock on the west side of the Sandia Mountains, Bernalillo County, New Mexico, at 6400 feet. When a single measurement is given, that measurement pertains to the holotype. Body elongate, somewhat slender; appendages moderately stout; sclerotic areas of abdomen and carapace light to moderately brownish gold in color, palpi deep gold in color; legs very light yellowish brown; body length 2.2 (2.15-2.3) mm. Carapace in the posterior and posterolateral areas membranous, oval sclerotic area of carapace not extending posterior to the level of the second coxae and including the entire anterior one-half of the carapace; posterior margin nearly straight, other margins weakly convex; two well-developed eyes on each side, the anterior one removed from the anterior carapacial margin by less than one-half of the diameter of the eye, the two eyes of one side separated by about one-half of the diameter of the anterior eye; surface of carapace smooth, with very few delicate setae; four very widely spaced setae along the posterior margin of the sclerotic area, anterior margin with four setae; length of carapace 0.51 (0.50-0.51) mm., greatest width as measured along the posterior carapacial margin about equal to the length and probably somewhat greater than in the living animal owing to spreading of the membranous part of the carapace in mounting, ocular width 0.27 (0.27-0.29) mm. Abdomen somewhat slender, sclerotic scutes separated by wide membranous areas; anterior two or three tergites very membranous, with sclerotic areas restricted in size and color; all tergites except the first and eleventh divided, with each tergal half bearing two or three delicate setae; sternites 4 through 10 divided, each sternal half usually with three marginal setae; sternite 6 with a medial

group of six setae (seven in one paratype), sternite 7 with a medial group of six setae, sternite 8 with the group represented by a single pair of setae; tenth and eleventh tergites and sternites with several long tactile setae; surface of tergites and sternites smooth except for a network of weak lines on the more posterior sternal halves and to a lesser extent on the more posterior tergal halves; each stigmatic plate with one seta, rarely two; abdomen 0.70–0.75 mm. wide in the prepared specimen, probably definitely less in the living individual.

Chelicera with fairly stout base, fingers relatively slender; surface unsculptured; base with five long setae; fixed finger with lamina exterior, inner margin of fixed finger with three, rarely four, retroconical teeth in the distal half and with two or three denticles on the inner margin of the apical tooth; movable finger not so regularly curved as the fixed finger, subapical lobe light in color, weakly sclerotic, fairly well developed, and terminally bicuspid; serrula exterior with 18 plates (rarely 17); the galea divided into two unequal rami near the base, the major ramus nearly straight, terminally bifid, and stouter than the second or minor ramus, which is gently curved and terminally acute; flagellum composed of four setae, the two longer of which are virtually equal in length and smooth except for one or two spinose processes near the end of the outer one; the longer of the other two flagellar setae with a length of about two-thirds of the longest seta of the flagellum, and the shorter of the two with a length nearly one-half of the length of the longest seta of the flagellum; chelicera 0.147 mm. long, base 0.10 mm. wide; movable finger 0.122 (0.120–0.125) mm. long.

Palpus of male with surface smooth, setae very delicate but often long, of a rich golden color. Measurements of the length of the trochanter, femur, and tibia are over-all measurements and include the virtually colorless, but nevertheless sclerotic, distal collar. Trochanter with flexor margin convex distal to the pedicel, less convex to nearly straight beyond; extensor margin very weakly concave to almost straight; length 0.235 (0.230–0.245) mm., width 0.113 (0.113–0.119) mm., length 2.08 (1.93–2.08) times the width. Femur with pedicel wider than long; extensor margin somewhat evenly and moderately convex beyond the pedicel; flexor margin convex in the basal half but very slightly concave beyond; greatest width near the center of the femur; 0.365 (0.365–0.378) mm. long, 0.124 (0.124–0.129) mm. wide, length 2.95 (2.86–2.95) times the width. Tibia with pedicel about as wide as long; flexor margin somewhat evenly and markedly convex; extensor margin flatly convex in the central portion but more strongly convex in the distal third; 0.382 (0.382–0.385) mm. long, 0.157 (0.157–0.160) mm. wide,

length 2.43 (2.41–2.45) times the width. Chela from dorsad with pedicel nearly square in outline; pedicel displaced slightly towards the flexor margin or very near the center of the basal margin; hand approaching a subcylindrical shape, with both flexor and extensor margins varying from gently convex to flatly convex; hand bulging to form a well-rounded basal-extensor margin; hand not strongly narrowed at finger base; fingers stout, gently curved, and shorter than the hand; length of chela 0.625 (0.62–0.65) mm., width 0.191 (0.184–0.198) mm., length 3.28 (3.23–3.51) times the width. From the side, chela appears fairly stout; pedicel wider than long and near the center of the base or displaced a little towards the ventral margin of the hand; hand subcylindrical, with both dorsal and ventral margins very weakly to flatly convex and with each margin of the hand merging into the basal margin without interruption; hand narrowed very little towards the finger base; movable finger gently curved, fixed finger nearly straight, with the inner margin weakly convex; teeth of the two fingers similar in number and kind, each finger with 16 to 20 teeth extending along nearly the entire finger margin, the distal 12 to 17 teeth conical and cuspid, the more distal teeth with the shape of equilateral triangles but gradually becoming less elevated near the center of the row, the proximal three to five teeth of each row flattened and acuspid, the most proximal two or three are so strongly vestigial that it is impossible to observe them except in properly oriented specimens; tactile setae arranged as shown in figures 16 and 17; chelal hand 0.33 (0.33–0.345) mm. long, depth of hand 0.191 (0.187–0.205) mm., movable finger 0.31 (0.31–0.32) mm. in length.

Legs light in color; surface smooth; podomeres fairly stout; setae sparse and delicate; arolia bifurcated near the tips of the tarsal claws, with each branch longer than the common base. First leg with trochanter 0.079 (0.083) mm. long, 0.066 (0.068) mm. deep; pars basalis with extensor margin nearly straight, flexor margin gently convex, length along the extensor margin 0.092 (0.088) mm., depth 0.069 (0.072) mm.; pars tibialis with moderately and evenly convex extensor margin, flexor margin a little less convex, length along the extensor margin 0.152 (0.152) mm., depth 0.080 (0.081) mm.; tibia with flexor margin gently convex, extensor margin nearly straight except weakly convex in the basal third, length 0.178 (0.175) mm., greatest depth near the beginning of the distal third and equal to 0.054 (0.055) mm.; metatarsus subrectangular, 0.056 (0.061) mm. long, 0.039 (0.040) mm. deep; telotarsus subcylindrical, very little narrowed towards the distal end, 0.089 (0.091) mm. long, 0.035 (0.037) mm. deep. Fourth leg with trochanter of holotype broken, that of paratype 0.141 mm. long, 0.088 mm. deep; pars

basalis with flexor margin nearly straight except becoming convex in the basal third, length along the flexor margin 0.138 (0.147) mm., depth 0.090 (0.091) mm.; pars tibialis with a straight flexor margin except a little convex in the distal third, extensor margin well arched and moderately convex, length along the extensor margin 0.310 (0.311) mm., depth 0.135 (0.135) mm.; over-all length of femur 0.378 (0.382) mm.; tibia with flexor margin evenly and regularly convex, extensor margin very weakly convex except for the more convex proximal third, length 0.259 (0.271) mm., greatest depth a little distal to the center and equal to 0.078 (0.078) mm., a relatively short tactile seta located on the extensor surface 0.096 (0.100) mm. from the proximal margin; metatarsus subrectangular, length 0.081 (0.083) mm., depth 0.051 (0.052) mm., a relatively long tactile seta located on the extensor margin 0.016 (0.018) mm. from the proximal-extensor corner; telotarsus subcylindrical, with nearly the same depth throughout, 0.113 (0.118) mm. long, 0.044 (0.044) mm. deep, tactile seta wanting.

External genitalia without setae on the anterior operculum except for eight setae in a medial row along the posterior margin just anterior to the aperture; posterior operculum with five to six setae forming a row on the face of the operculum and but little closer to the posterior margin than to the aperture, in addition two pairs of two setae in a medial row on the anterior edge of the operculum just posterior to the aperture; genital sacs observed in the holotype and one paratype, well developed, at least three times as long as the maximum width; genital complex much as shown by Chamberlin (1923, pl. 1, fig. 1) for *S. serianus* except for the conspicuously more slender genital sacs in *S. dolosus*.

FEMALE: Description is based on one individual, the allotype. Female very similar to the male in general appearance and structure; body 2.7 mm. long. Carapace like that of the male with respect to color, shape, and chaetotaxy; carapace 0.56 mm. long, greatest width slightly less than the length, ocular width about 0.30 mm. Abdomen with chaetotaxy like that of the male but no well-developed medial groups of setae on sternites 6 and 7, although each of sternites 6 through 8 bears a pair of setae similar in position and length to the pair of setae on sternite 8 of the male; each stigmatic plate with a single seta, except that the seta is absent from one anterior plate of the allotype; abdomen about 0.85 mm. wide. Chelicera of female virtually identical with that of the male except for a slightly larger size; position of chelicerae on slide prevents counting the plates of the serrula exterior; inner margin of fixed finger with four retroconical teeth, two denticles on the inner margin of the apical tooth; chelicera about 0.17 mm. long, base 0.118 mm. wide, movable finger

0.135 mm. in length. Palpus of female much like that of the male except for greater length of podomeres; chelal hand from dorsad with extensor and flexor margins a little less convex than in the average male and with the pedicel located near the center of the basal margin; length/width ratios in the two sexes virtually identical; trochanter of female 0.27 mm. long, 0.125 mm. wide; femur 0.41 mm. in length, 0.142 mm. in width; tibia 0.43 mm. long, 0.173 mm. wide; chela 0.71 mm. in length, 0.22 mm. in width. In side view, chela is similar to that of the male; marginal teeth similar in number, shape, and distribution; tactile setae of the finger as in the male; hand of chela 0.38 mm. long, depth 0.215 mm.; movable chelal finger 0.34 mm. in length. Legs like those of the male. First leg with trochanter and pars basalis broken; pars tibialis as measured along the extensor margin 0.170 mm. long, 0.095 mm. deep; tibia 0.199 mm. long, 0.060 mm. deep; metatarsus 0.066 mm. in length, 0.044 mm. in depth; telotarsus 0.104 mm. long, 0.040 mm. deep. Fourth leg with trochanter 0.152 mm. long, 0.096 mm. deep; pars basalis as measured along the flexor margin 0.155 mm. in length, 0.105 mm. deep; pars tibialis measured along the extensor margin 0.350 mm. long, 0.151 mm. deep; entire femur 0.425 mm. in length, tibia 0.295 mm. long, 0.089 mm. deep, tactile seta removed 0.105 mm. from the proximal margin; metatarsus 0.096 mm. long, 0.058 mm. deep, tactile seta on extensor surface 0.018 mm. from the proximal corner of the podomere; telotarsus 0.135 mm. long, 0.049 mm. deep. External genitalia of female very simple, little sclerotic; posterior margin of anterior operculum with an irregular group of four setae tending to form a uniseriate row on each side of the median line; posterior operculum with six setae in a uniseriate row across the medial part of the operculum and about midway between the anterior and posterior margins.

TRITONYMPH: One mounted tritonymph paratype available for study. Very much like the adult in general body form, but much lighter in color; palpal podomeres appreciably smaller and appearing a little stouter; body length 2.2 mm.; carapace 0.41 mm. long, ocular width 0.225 mm. Chaetotaxy of abdomen much as in the female except two setae with virtually contiguous areoles accompanying each anterior stigmatic plate, one seta on each posterior plate. Chelicera including the galea much as in the adult; five setae on the base; 15 plates in the serrula exterior; movable cheliceral finger 0.103 mm. long. Palpal podomeres with contours of margins much like those of the adult except that the flexor margin of the chelal hand is not so much flattened and forms a nearly unbroken contour from finger base to pedicel, causing displacement of the pedicel towards the flexor side of the hand; trochanter 0.191 mm. long, 0.090 mm. wide;

femur 0.265 mm. in length, 0.101 mm. in width; tibia 0.285 mm. long, 0.124 mm. wide; chela 0.475 mm. long, 0.145 mm. wide. Favorable direct lateral view of chela not obtained owing to disorientation after mounting, but apparently hand is subcylindrical as in the adult; movable chelal finger with three tactile setae, all within the basal half of the finger, with the middle seta one and one-half times as far removed from the distal as from the proximal seta; fixed finger with seven tactile setae, arranged much as in the adult, except only two, rather than three, interior setae in an oblique row near the base of the finger; each finger with about a dozen teeth along the distal half of the margin, the teeth similar to those of the adult; chelal hand 0.275 mm. long; movable finger 0.225 mm. in length.

DEUTONYMPH: Four deutonymphs were available for study. Measurements given are for the range of all four individuals except where otherwise indicated. Body and appendages of a little lighter color and appreciably smaller than in the tritonymph, but ratios of palpal podomeres of the two nymphal instars are very similar; body length (two individuals) 1.4–1.6 mm.; ocular width (one individual) 0.19 mm.; bodies of the deutonymphs, being very fragile, were not cleared in caustic, and the abdominal chaetotaxy cannot be satisfactorily studied. Chelicera like that of the adult in important taxonomic characteristics, but base stouter and with only four setae; serrula exterior with 14 to 15 plates; galea identical with that of the adult; movable finger 0.082–0.087 mm. in length. Palpal podomeres smaller than in the tritonymph; shape and ratios of podomeres differing little from those of the tritonymph, but podomeres have the general appearance of being stouter, probably as a result of the very poor differentiation of the pedicel in the tibia and femur; trochanter 0.151–0.167 mm. long, 0.079–0.083 mm. wide, length 1.82–2.04 times the width; femur 0.220–0.231 mm. long, 0.081–0.088 mm. wide, length 2.62–2.75 times the width; tibia with pedicel wider than long, extensor margin more strongly convex than in the tritonymph and adult, length 0.224–0.235 mm., width 0.096–0.100 mm., length 2.32–2.4 times the width; chelal hand with outline like that of the tritonymph, chela 0.400–0.406 mm. long, 0.117–0.121 mm. wide, length 3.33–3.43 times the width. From the side, hand is cylindrical, not narrowed but sometimes a little widened towards the finger base, both dorsal and ventral margins nearly straight, becoming basally convex and merging gently with the basal margin; movable finger with two tactile setae, one seta near or just within the basal one-sixth of the finger and the other within or near the basal two-fifths of the finger; fixed finger with six tactile setae arranged in much the same manner as in the tritonymph, but one



of the basal setae of the external series is missing; marginal teeth as in the adult and tritonymph except only 10 to 12 teeth on each finger, the triangular cuspid teeth being fewer in number than in the adult, while the number of vestigial and acuspid teeth are approximately equal to the number found in the adult; chelal hand 0.205–0.215 mm. long, depth 0.113–0.120 mm.; movable chelal finger 0.195–0.21 mm. in length.

**PROTONYMPH:** Description is based on a single protonymph paratype in which the body is so broken that the length cannot be obtained. The protonymph is very similar to the deutonymph in general appearance but is smaller. The serrula exterior of the chelicera is composed of 13 plates. Palpal trochanter 0.125 mm. long, 0.067 mm. wide; palpal femur 0.175 mm. long, 0.069 mm. wide; tibia 0.17 mm. in length, 0.078 mm. wide; chela with a length of 0.33 mm., width 0.095 mm.; chelal hand 0.17 mm. long, 0.095 mm. deep; movable chelal finger 0.16 mm. in length. The movable chelal finger has a single tactile seta inserted about one-fourth of the finger length from the basal margin. The fixed chelal finger has three tactile setae: one interior and at the very base of the finger, one exterior located at a level a little proximal to the interior basal seta, and one seta located on the exterior surface of the finger about one-fourth of the finger length from the tip. Each finger has five cuspid and a few vestigial teeth on the distal part of the margin of the finger.

**REMARKS:** *Serianus dolosus* can be separated from other species of the genus *Serianus* by many characteristics, but chiefly those associated with the shape, size, and length/width ratios of palpal podomeres. In this connection, it is unfortunate that the absolute sizes of the palpal podomeres are not given for all described species, as size ranges would no doubt greatly facilitate the separation of species of *Serianus*. From the literature, it is very obvious that our species is only about one-half as large as *Serianus birabeni* Feio, 1945, from Argentina. This difference allows easy separation of these two forms. From the Argentine *Serianus minutus* Hoff, 1950, our species is separated with a little more difficulty, for there is a marked similarity in the size and length/width ratios of palpal podomeres. *Serianus dolosus* and *S. minutus* can be separated without difficulty, however, on the basis of the nature of the galea, the shape of the chelal hand, and the persistent presence of four tactile setae on the movable chelal finger of *S. dolosus*. From the four previously described North American species, our species appears to be distinct in many ways. From *S. arboricolus* (Chamberlin, 1923) and *S. litoralis* (Chamberlin, 1923) separation of our species can be made by the chelal fingers being shorter than the hand, the palpal tibia being longer than the femur, and the chelal hand being more cylindrical in shape, as well

as by the presence of medial groups of setae on sternites 6 and 7 of the male *S. dolosus*. On the other hand, our present species resembles *S. solus* (Chamberlin, 1923) and *S. serianus* (Chamberlin, 1923) in the relative lengths of the chelal fingers and hand, in the relative lengths of the femur and tibia of the palp, in the general appearance of the chelal hand, and in the presence of a group of three or more setae on some of the sternites of the male. *Serianus solus* differs from *S. dolosus* by having a stouter palpal chela and relatively short chelal fingers, as well as by the presence of a group of three or more setae on the eighth sternite of the male (Chamberlin, 1930). A comparison of our specimens with the figure given by Chamberlin (1923, pl. 2, fig. 3) for the palpus of *S. solus* indicates radical differences in the shape of the palpal tibia and chela of the two species. Of all species of *Serianus*, our species appears to be most closely related to *S. serianus* (Chamberlin, 1923). The relationship is so close that specimens of *S. dolosus* tend to go to *S. serianus* in the key given by Chamberlin (1930). The similarity of the two species is particularly pronounced with respect to characters of the palpi. However, *dolosus* and *serianus* differ in many ways. For instance, the palpal femur, tibia, and chela of the male and the tibia of the female are definitely more slender in *dolosus*, using the relative measurements of the palpal podomeres given by Chamberlin (1923) as a basis for determining the length/width ratios in *serianus*. Differences in slenderness of the palpus becomes somewhat evident when our specimens are carefully compared with figures given by Chamberlin (1923, fig. on p. 357, pl. 2, fig. 2). Specimens of *dolosus* have the extensor margin of the femur less convex and the pedicel of the tibia relatively longer and more slender. In addition, the juncture of the extensor and basal margins of the hand is less angular in *dolosus* than in *serianus* and the flexor margin of the hand is flatly convex and the pedicel is almost symmetrically placed in our species, while in *serianus* the flexor margin of the hand is more uniformly rounded and the pedicel is displaced towards the flexor side of the hand. Also, the serrula exterior has 16 plates in *serianus* (Chamberlin, 1923) while in *dolosus* it usually has 18, rarely 17, plates. Then, as mentioned in the description of the male above, the genital sacs of *dolosus* are relatively much more slender than those shown for *serianus* by Chamberlin (1923, pl. 1, fig. 1), and the group of three or more setae on the eighth sternite of the male of *serianus* (Chamberlin, 1930) is represented in *dolosus* by a single pair of setae.

It is interesting to note that Beier (1932) questionably assigned *Olipum frontalis* Banks, 1909, to the genus *Serianus*. As discussed above, *frontalis* is very probably assignable to the genus *Pseudogarypinus*. At

any rate, *frontalis* is so different that, even if the species were in the genus *Serianus*, *frontalis* and *dolosus* could not be conspecific.

All records of *S. serianus*, the closest relative to *S. dolosus*, are from the west coastal region of Mexico, with the exception of a single male reported by Chamberlin (1930) from the extreme southwest corner of Utah and considered by Chamberlin as possibly belonging to an undescribed subspecies of *S. serianus*. Because the specimen taken in Utah is said by Chamberlin to be more slender than specimens unquestionably assigned to *S. serianus*, it is possible that the specimen under discussion is conspecific with *S. dolosus*. A definite expression of the relationship of the Utah specimen to *dolosus* must await examination of the former specimen, which is in the collections of J. C. Chamberlin.

RECORDS: *Bernalillo County*: The allotype female, one paratype male, and three paratype deutonymphs taken from oak litter in Cedro Canyon, Manzano Mountains, east of Albuquerque, at 6600 feet elevation; one paratype male from beneath a rock and a paratype tritonymph from a clump of grass, west base of the Sandia Mountains, east of Albuquerque, at about 6400 feet elevation. *Sandoval County*: One paratype deutonymph from pinyon litter taken in the Juan Tabo Recreation Area at the northwest corner of the Sandia Mountains, west of Bernalillo, at about 7000 feet elevation. *Santa Fe County*: The holotype male, one paratype male, and one paratype protonymph from pinyon litter, 8 miles north of Golden, Ortiz Mountains, at an elevation of nearly 7000 feet. While the specimens have been taken in three different counties, the localities are all within the confines of a very small geographical area. There is a remarkable restriction of this species to a very narrow altitudinal band of 6400 to 7000 feet. The limited geographical distribution of this species, as shown by its absence from closely adjacent areas, suggests that the species may be endemic.

*Serianus*, sp. indet.

In our collections there is a single deutonymph without accompanying adults. This deutonymph differs from the deutonymphs of *Serianus dolosus* by having a much more slender and cylindrical chelal hand and by being somewhat smaller in size. It is probable that this single immature individual, which is clearly congeneric with *Serianus*, represents an undescribed species of the genus. In the absence of adults it seems unwise to establish a species based on this single specimen.

RECORD: a single deutonymph in a sampling of litter and sand from beneath mesquite, *Prosopis juliflora* (Swartz) DeCandolle, about 10

miles east of Fort Sumner, De Baca County, at an elevation of about 4100 feet.

### FAMILY GARYPIDAE HANSEN

Pseudoscorpions of this family are readily separated from those belonging to the other two families of the superfamily Garypoidea by the following combination of characters: a venom apparatus in both of the chelal fingers, pleural membrane of abdomen with wrinkled or granulate (not smoothly plicate) appearance, carapace definitely triangular in outline, coxal area usually widened posteriorly, and setae of palps and tergites generally short and inconspicuous, especially when acute. The family is divided into two subfamilies. One of these, the Geogarypinae, is typically Oriental and African in distribution. The other subfamily, the Garypinae, is virtually world wide in geographical distribution and is represented in New Mexico by a single species.

### SUBFAMILY GARYPINAE SIMON

The pseudoscorpions of this subfamily are characterized by having three or four setae in the cheliceral flagellum, a maxilla of the usual or customary appearance without an anterior maxillary shoulder, and weakly developed or obsolete stigmatic helices (valves for closing the openings into the tracheal trunks). The subfamily contains nearly a dozen genera, of which only three are known from the United States. A single genus is reported from New Mexico.

### *ARCHEOLARCA* HOFF AND CLAWSON

*Archeolarca* HOFF AND CLAWSON, 1952, Amer. Mus. Novitates. no. 1585, p. 2.

The genus *Archeolarca* is characterized by having a widely ovate abdomen; palpi slender, with bent and sublanceolate setae; movable chelal finger with four tactile setae, *t* and *st* submedial in position, *sb* and *b* proximal in position; fixed chelal finger with eight tactile setae, *est* and *it* at nearly the same level near the midpoint of the finger, *ist* a little proximal to the midpoint of the finger and but little closer to *it* than to *isb*; four setae in the flagellum; laminal seta of chelicera absent; pars basalis of the first leg conspicuously longer than the pars tibialis; arolia longer than the tarsal claws. Only the type species, *A. rotunda*, has been assigned to the genus.

### *Archeolarca rotunda* Hoff and Clawson

*Archeolarca rotunda* HOFF AND CLAWSON, 1952, Amer. Mus. Novitates, no. 1585, p. 2.

The New Mexico specimens agree in every detail with the type specimens from Utah except for slightly smaller absolute sizes of the pedal and palpal podomeres. The slight differences in size cannot be considered significant, however, and are no doubt due to individual variation, which is greater than indicated by the limited number of specimens studied by Hoff and Clawson (1952). The only adults in the New Mexico collection are females and, while they are smaller than the females reported from Utah, the appendages actually are no smaller than reported for males of the Utah collections.

In order to indicate the variation in size relative to our New Mexico specimens, ranges of a number of measurements are given here for three females mounted in Canada balsam. Body length 2.3–2.6 mm.; carapace 0.60–0.65 mm. in length; ocular breadth as measured on a level between the two eyes of each side about 0.40 mm.; abdomen somewhat spread in the prepared specimens and measuring about 1.4 mm. in width. Chelicera with movable finger 0.132–0.140 mm. in length. Palps with trochanter 0.335–0.354 mm. in length, 0.183–0.195 mm. in width, length 1.82–1.88 times the width; femur 0.79–0.84 mm. long, 0.179–0.189 mm. wide, length 4.4–4.45 times the width; tibia 0.69–0.73 mm. long, 0.203–0.215 mm. wide, length 3.37–3.4 times the width; chela 1.00–1.05 mm. in length, 0.28–0.32 mm. wide, length 3.28–3.6 times the width; chelal hand 0.51–0.54 mm. long, 0.26–0.29 mm. deep; movable chelal finger 0.50–0.52 mm. in length. First leg with pars basalis 0.287–0.299 mm. long, 0.090–0.098 mm. deep, length 3.05–3.2 times the depth; pars tibialis 0.203–0.223 mm. long, 0.092–0.101 mm. deep, length 2.2 times the depth. Fourth leg with entire femur 0.59–0.62 mm. long, 0.132–0.140 mm. deep, length 4.32–4.47 times the depth.

The length/width ratios of palpal and pedal podomeres are virtually identical for the Utah specimens and for our New Mexico individuals, with no exception that may be considered more than a result of individual variation. In the Utah females the length/width ratio of the palpal chelae ranges from 3.5 to 3.65, while in the three New Mexico females studied the range is from 3.28 to 3.6. In many of the diplosphyronid pseudoscorpions, there is commonly found a greater degree of range in the length/width ratio of the chela than in the length/width ratios of other palpal podomeres, and it is not surprising that two of the three New Mexico specimens should have chelal ratios just below 3.3. In the original description of the females of this species, measurements for the femur of the fourth leg are given only for the allotype female. By computation it is found that the length/width ratio of the fourth pedal femur is 4.66 for the allotype, in comparison to ratios of 4.32 to 4.47 in our three

females from New Mexico. Again the difference between the Utah allo-type and the present material is not critical, especially as unpublished measurements of one of the Utah paratype females indicate a length/width ratio of 4.45.

In the original description of the females from Utah, the anterior genital operculum is described as having 15 setae arranged in a uniseriate row (Hoff and Clawson, 1952). Examination of additional specimens indicates that the row is irregularly uniseriate, with not all of the setae placed uniformly along a line across the operculum. In our present females, the number of setae in the row on the anterior operculum ranges from nine to 12. The setae of the posterior operculum range in number from seven to nine for our three New Mexico females, and this range falls within the range of seven to 11 given for the type females. There is no reason to consider the variation in chaetotaxy of the anterior operculum as other than individual variation.

RECORD: Four females and two tritonymphs taken from a nest of *Neotoma albigula* Hartley in Monticello Canyon, Sandia Mountains, east of Albuquerque, Bernalillo County, at an elevation of 7500 feet; collection taken February 9, 1953, by H. B. Morlan. It is interesting to note that previously the species has been taken only from nests of *Neotoma cinerea* (Ord), with the exception of one deutonymph from a nest of *Erethizon epixanthum epixanthum* Brandt. All previous records are from Utah (Hoff and Clawson, 1952).

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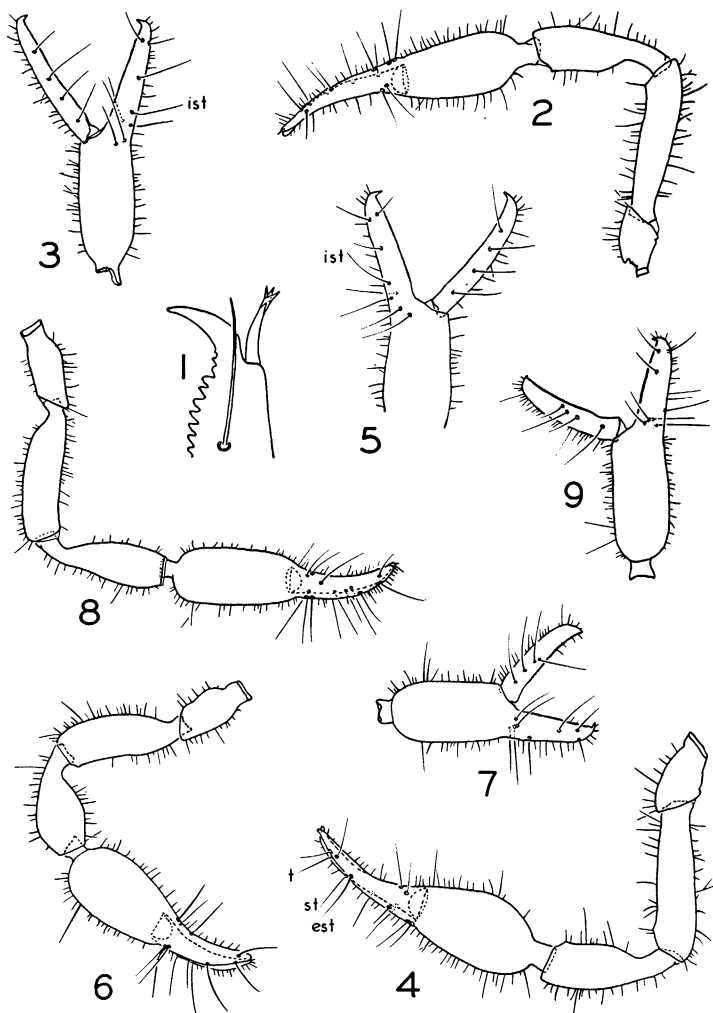
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FIGS. 1-5. *Microcreagris laudabilis*, new species. 1. Distal portion of movable cheliceral finger, holotype male. 2. Dorsal view of palp, holotype male. 3. Lateral view of chela, holotype male. 4. Dorsal view of palp, allotype female. 5. Lateral view of chelal fingers, allotype female.

FIGS. 6-7. *Syarinus obscurus* (Banks), male. 6. Dorsal view of palp. 7. Lateral view of chela, with the distal half of the fixed finger appearing short and stout because of position of specimen on slide.

FIGS. 8-9. *Syarinus honestus*, new species, holotype male. 8. Dorsal view of palp. 9. Lateral view of chela.



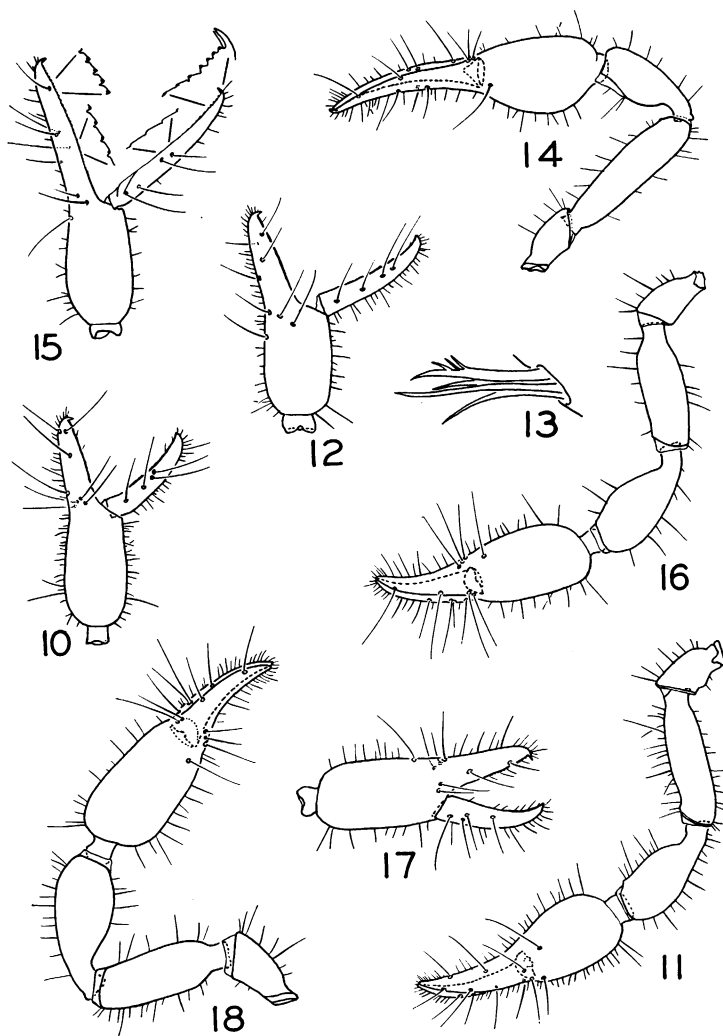


FIG. 10. *Syarinus granulatus* Chamberlin, female. Lateral view of chela.

FIGS. 11–12. *Chitrella transversa* (Banks), male. 11. Dorsal view of palp. 12. Lateral view of chela.

FIGS. 13–15. *Neoamblyolpium alienum*, new genus and new species, holotype male. 13. Flagellum of chelicera. 14. Dorsal view of palp. 15. Lateral view of chela, with details of marginal teeth of chelal fingers.

FIGS. 16–18. *Serianus dolosus*, new species. 16. Dorsal view of palp, holotype male. 17. Lateral view of chela, holotype male. 18. Dorsal view of palp, allotype female.

