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HARLOW B. MILLS, *Chief*

The Pseudoscorpion of Illinois

C. CLAYTON HOFF

Printed by Authority of the
STATE OF ILLINOIS
ADLAI E. STEVENSON, *Governor*
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This paper is a contribution from the Section of Faunistic Surveys and Insect Identification.

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FOREWORD

During the latter part of 1946, all the zoological collections of the Illinois Natural History Survey were brought together into one section, formerly the *Insect Survey Section*, which was then renamed the *Section of Faunistic Surveys and Insect Identification*. Previously, the Natural History Survey had published a series of reports on the insects of Illinois and, at the same time, had developed the entomological collections. The double aim of the above reorganization was, first, to effect a well-balanced program in the Survey's faunistic activities with the hope that useful reports on the Illinois fauna would be made for groups other than insects and, second, to build up a comprehensive reference collection of study material for the identification of animal groups occurring in the state.

A firm basis of expansion in several non-insect groups, such as the fish and mollusks, was provided several years ago by the extensive Illinois collections of Stephen A. Forbes, Robert E. Richardson, and Frank C. Baker. Although in recent years certain other groups, especially the arthropods and reptiles, have been fairly well collected in the state along with the insects, our collections of many forms are at a beginning level.

The general aim for all groups is now the one that has been developed for the insects: to build up as extensive and inclusive a collection of Illinois species as possible, and to supplement this with representatives of other North American genera and species in each group.

We feel fortunate in presenting this account of the pseudoscorpions of Illinois as the first report of the expanded part of the program. In 1943 we began a co-operative undertaking with Dr. C. Clayton Hoff, then at Quincy College, Quincy, Illinois, with the view of investigating the pseudoscorpion fauna of the state. At that time we were making extensive ground cover samples in connection with certain insect projects, and this activity dovetailed very well with a survey of the pseudoscorpions. Dr. Hoff reported such unusual findings, and a fauna so much more extensive than had been expected, that we soon decided to make his study the basis of a thoroughgoing faunistic report on the group for Illinois.

This decision was strengthened by the very apparent need for such a study of the pseudoscorpions. Up to about 1930 the taxonomy of this group in North America was in a preliminary and superficial stage. It was not until comprehensive analyses of the known world fauna were presented by J. C. Chamberlin and Max Beier in the 1930's that a groundwork was laid for modern studies of the group. Since no detailed faunistic report has previously been prepared for any region on the North American continent, we hope that this Illinois report will prove useful to many investigators.

We are grateful indeed to Dr. Hoff for the identification of material and preparation of the manuscript, and for contributing much of his own time to this project. Members of our staff in the Section of Faunistic Surveys and Insect Identification have contributed materially to the project. Several of them have assisted with the field program and with adaptation of the manuscript to current Survey practices. Four total views of pseudoscorpions were prepared especially for this work by Dr. Carl O. Mohr, formerly Associate Entomologist and Artist. Mr. James W. Curfman assisted with the preparation, numbering, and lettering of the plates. Mr. Lewis J. Stannard, Jr., Mrs. Leonora K. Gloyd, and Mrs. Dorothy A. Moulton compiled the index and assisted in assembling the Illinois records, preparing the bibliography, and checking and integrating the manuscript.

We have enjoyed throughout the help and co-operation of the Technical Editor, Mr. James S. Ayars, and Mrs. Drew S. Wetzel and Mrs. Blanche P. Young of his staff.

HERBERT H. ROSS
Systematic Entomologist

CONTENTS

Ground cover or duff in woods such as these harbors a wide variety of pseudoscorpion species. When a sample is to be collected, the dry top leaves should be brushed away and the moist lower leaves and the top layer of soil scooped up. Samples from the lee of a log are often unusually productive.

The Pseudoscorpions of Illinois

C. CLAYTON HOFF*

PSEUDOSCORPIONS are minute animals only a few millimeters long, with the general appearance of diminutive scorpions except that they have no tails. They belong to the large phylum of joint-legged animals, the Arthropoda, and to the class Arachnida, which, in addition to the pseudoscorpions, embraces the spiders, mites, ticks, scorpions, and other related groups. Pseudoscorpions are seclusive in habit, occurring in soil cover and rotten logs, under bark, and in similar places out of doors; one species is found in houses. In their natural habitat, these little brown animals are difficult to see, especially when they draw in their legs and "play possum." In this position they look like little specks of dirt. Probably because pseudoscorpions are inconspicuous, few collections of the group have been made in the past, and the fauna, at least of North America, and especially of the central and north-central United States, has remained scantily known. Prior to the initiation of the present studies, only one list was available for this region, that of Ewing (1911), which contained records of six species from Illinois and two additional species from neighboring states.

Two factors have contributed to a considerable expansion of our knowledge of this group for the Illinois region. The first factor was the work of J. C. Chamberlin and Max Beier, both of whom, about 1930, made extensive contributions to the taxonomy of the world fauna of the pseudoscorpions, delineating the suborders, families, and genera clearly for the first time, and utilizing an abundance of new identification characters. The second factor was the development of the Berlese funnel method of collecting pseudoscorpions and associated small animals. This method, described on page 418, has made possible collecting of large series of many species and obtaining for the first time what appears to be a fairly accurate representation of the total fauna of Illinois. At the present time the list of known Illinois species stands at 26. Undoubtedly, other species will be found with additional collecting; the present study, based on over 5,000 specimens, represents about 350 collections.

The object of this report is twofold, first to present illustrated keys and descriptions for the identification of species in this region, and, secondly, to summarize information regarding the distribution, biology, and habitat preferences of the species. As an aid in use of the keys, a section has been included on morphology, in which the structures now considered of major taxonomic importance are explained.

Summarizing the distribution has been especially difficult because many identifications made prior to Chamberlin's work are probably incorrect and should be rechecked before they are cited. Because of this situation there is little accurate information to serve as a guide in foretelling what additional described species may be collected in Illinois. In order to make this report of wide application, the keys have been made to include all the genera known from the central and northeastern portions of the United States and adjacent portions of Canada.

BIOLOGY

Available information on the development and habits of pseudoscorpions is meager and is based chiefly on the study of a few large species, most of them of the suborder Monosphyronida. Scarcely any biological information is available for the smaller forms belonging to the suborders Diplosphyronida and Heterosphyronida.

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Feeding Habits

Pseudoscorpions feed on small animals such as mites, ants, and a wide variety of other insects, as indicated by the many pseudoscorpions observed with such prey in the chelae of the pedipalpi or palps. The pseudoscorpion's mouth, located on a tubular structure called the rostrum, contains a sucking structure, the pharyngeal pump, for taking in liquid food. The pseudoscorpion grasps its prey with the palps. These prehensile organs are supplied with a venom apparatus that effectively kills or anesthetizes the captured prey within a matter of seconds. The palps and chelicerae, together or singly, hold the prey to the mouth and the pseudoscorpion sucks the fluids from the body of its victim.

The larger pseudoscorpions, especially *Chelifer cancroides,* make interesting pets. One may be kept in a small corked vial into which is released a fly occasionally. The pseudoscorpion will stalk the fly patiently for a long time; then suddenly it will reach out a palp and seize the fly. A good-sized house fly will put up quite a struggle, sometimes flying around with the pseudoscorpion attached; sometimes the pseudoscorpion will be stretched out in mid-air, grasping the cork with one chela and the fly with the other; but in a few moments the battle is over, and the fly is completely quiet. Then the feast begins.

Evidence to date indicates that no pseudoscorpions live as ectoparasites on larger animals. Pseudoscorpions occur abundantly in mammal and bird nests, but apparently they are not parasitic on the mammals or birds but instead feed on small arthropods in the nests. Species have been reported as nipping man, but without inflicting any appreciable injury (Beier 1932*d*, 1941; Feio 1941).

Large numbers of species have been reported from beneath the wings or elytra of beetles, as well as from the bodies of other insects and birds, as described by Vachon (1940, 1947). These cases appear to be nothing more than phoresy, with the pseudoscorpions feeding on mites and other soft-bodied arthropods associated with the larger flying insects and birds. Vachon forcefully expresses the idea that phoresy with few exceptions is confined to the females. He believes that phoresy is a response to insufficient food at a time when the females are carrying and feeding the larval young.

Enemies

While pseudoscorpions prey upon smaller animals, they are in turn the prey of larger animals, especially birds, as indicated by the frequency with which pseudoscorpion remains are recovered from the digestive tracts of birds. The part played in food cycles appears to be the pseudoscorpions' claim to ecological importance.

Development

Pseudoscorpions have several distinct stages in their life history: (1) the egg, in most species carried by the female; (2) the larva, in most species also carried by the female; (3) three stages of nymphs, which are free living; and (4) the adult.

The pseudoscorpion female usually produces only a small number of eggs, ranging from 3 or 4 to as many as 30. The eggs in most species are not laid indiscriminately, but are simply extruded from the abdomen and retained as a group attached to the base of the abdomen in contact with the external genitalia. As the eggs are laid, they are grouped in a single-layered rosette or around the periphery of a spherical mass. In either case the egg mass becomes enclosed by a thin membrane.

As young develop within the eggs, the enveloping membrane is lost and the larvae assume positions with their heads toward the center of the rosette or spherical mass. Each of the first stage larvae has a sucking apparatus for feeding, and rudiments of the appendages, nerve ganglia, and other structures. The larvae secure a nutrient fluid secreted from the maternal ovaries, which become modified for this particular function. During the period of larval development the females of those groups in which the larvae form a single-layered rosette remain active, while the females in which the larvae are arranged in the form of a spherical mass have been observed to seal themselves in a nest and remain inactive. The presence of large amounts of yolk in the eggs of a few species (Essig 1929) suggests that the larvae in these groups develop without attachment to the mother.

As development continues, a second larval stage is formed. In this stage, the sucking apparatus is atrophied and the larva apparently lives on the food accumulated during the first or feeding stage of larval development. Also, during the second larval stage, the appendages and other structures

of the nymph gradually make their appearance.

At the end of the larval development, the first nymphal stage or protonymph escapes from the brood pouch and begins to lead an independent life. The protonymph has essentially the same general appearance as the adult. The continued development includes three molts, and the individual passes successively through the *protonymph, deutonymph,* and *tritonymph* stages, to form finally the sexually mature adult stage. At the time of each molt, the nymph secludes itself in a silken nest for a period of 10 or 15 days, during which time distinct morphological reorganizations take place. The various morphological changes that occur between nymphal stages and between the tritonymph and the adult include the gradual addition of tactile setae on the palpal chelae and a gradual change in the shape of various body parts, such as the segments or podomeres of the appendages. The nymphal stages of one Illinois pseudoscorpion, *Apochthonius moestus,* have been discussed in detail by Hoff (1946*b*); the various stages of another species, *Chthonius tetrachelatus,* have been described by Vachon (1941*a*, 1941*b*).

Maturity and Reproduction

Adult pseudoscorpions are undoubtedly fairly long lived, living probably for 6 months to a year or two. This surmise is based on collecting observations and notes made on a few individuals kept in captivity. Few exact data over an extended period are available.

As is true of their relatives, pseudoscorpions are dioecious. The males and females are similar in appearance. With the possible exception of a few forms, such as the genus *Microbisium,* in which the males have never been found, they reproduce sexually; apparently in the *Microbisium* females reproduce parthenogenetically.

According to Beier (1932*d*), mating takes place in the spring, during April and May, but this information is based on the study of only a few forms in the holarctic region and possibly cannot be applied to species from other areas. Unfortunately, information relative to mating is from observations of a few species of Monosphyronida only, and generalizations cannot be made for the entire order. In the few species that have received detailed study (Kew 1912), the male and female perform a courtship dance as a part of the mating activity. During the period of marked sexual activity and the courtship dance, a spermatophore is released by the male. Sperms from this spermatophore are picked up by the female. About 1 month after the transfer of sperms from the male to the female, the eggs are extruded.

HABITAT PREFERENCES

Pseudoscorpions have invaded many different habitats in almost every part of the world. For the most part, the smaller forms live in debris and fertile soil, the larger forms under stones, under bark of trees, in decaying vegetation, and abundantly in mammal and bird nests. One genus, *Garypus,* is found usually along the seacoast under stones and among algae and seaweeds.

Some species of pseudoscorpions occupy very particular and restricted niches. The habitat relationships of most Illinois pseudoscorpions are summarized below. A few species are omitted as a result of inadequate ecological data.

Deciduous Forests

The abundant microhabitats found in the forest, fig. 1, afford the favorite living conditions for pseudoscorpions in Illinois. The species inhabiting forest ground cover and decaying wood are among the most abundant and widely distributed of our pseudoscorpions.

Three species have been found only in ground cover and litter: *Apochthonius moestus, Heterochthonius multispinosus,* and *Mundochthonius sandersoni. Dactylochelifer copiosus* has been found in the same habitats, and one collection of this species was swept from vegetation.

Five species have been found chiefly in rotting wood or under bark of logs and stumps: *Verrucaditha spinosa, Lamprochernes oblongus, Dinocheirus pallidus, Pselaphochernes parvus,* and *Acuminochernes crassopalpus.* The last two are especially common in the rotten wood and debris of hollow trees.

Two species, *Parachernes squarrosus* and *Microbisium confusum,* are found both in ground cover and in rotting logs and stumps; *Mirochernes dentatus* occurs in both habitats and also is common in cavities of hollow trees.

Under bark of living trees, chiefly oak and hickory, occurs *Idiochelifer nigripalpus.*

Fig. 1.—Woods at Starved Rock State Park, Illinois. Wooded hillsides offer a wide variety of habitat niches: ground cover, rotten logs, hollow trees, moss, and root tangles. All these are prospective pseudoscorpion habitats.

Rock Outcrops

Three species have been found associated with rock outcrops, fig. 2. These pseudoscorpions live in the debris and leaf mold on the rock ledges or at the bases of outcrops. *Chthonius tetrachelatus* has been taken in association with limestone outcroppings; *Mundochthonius rossi* and *Larca granulata* have been taken only around sandstone outcroppings.

Sand Dunes

Our only collections of *Paisochelifer callus* have been taken in grass and ground cover in sand dunes.

Swamps and Bogs

Microbisium brunneum has been taken in Illinois only in the moss and debris in tamarack bogs of the northern part of the state and in cypress swamps of the southern tip.

Domestic Situations

Chelifer cancroides is never found in natural habitats removed from habitations of human beings. Around man, however, it is widespread and abundant, occurring in chicken houses, barns, dwellings, beehives, and nests of starlings and sparrows.

DISTRIBUTION

Pseudoscorpions are found in all parts of the world except in the arctic and the antarctic regions. They reach their greatest degree of development both in population numbers and in diversity of species in the tropics and subtropics. Many of the super-

families or families are world-wide or nearly world-wide in distribution, with at least a few representatives on nearly every large land mass and with a concentration of closely related species on one or two of the continents. Thus, the diplosphyronid superfamily Neobisiidea is holarctic, while the heterosphyronid Tridenchthoniidae and monosphyronid Atemnidae are typically circumtropical. In the Tridenchthoniidae, however, we find a few species in the nearctic region and in the Atemnidae a few species outside of the distinctly tropical regions. Most of the family and subfamily groups have representatives in a wide geographical area.

Such a widespread distribution appears interesting in a group without apparent means of rapid dispersal. There are several possible ways, however, by which dispersal may be accomplished. The small forms are

Fig. 2.—Sandstone ledges in Starved Rock State Park, Illinois. Dry leaves and sparse grass accumulate on the ledges and in the crevices of these outcrops to form a thin, dry layer of organic material. A few animals, apparently especially adapted to these dry conditions, live here. One of the denizens of these ledges is the Illinois pseudoscorpion *Mundochthonius rossi*.

readily carried by air currents and even the larger species may on occasion be carried in this way just as are many of the insects and spiders. Many forms are no doubt transported by large insects and by mammals and birds. Man may be an important factor in distribution of some species, as indicated by the widespread domestic distribution of *Chelifer cancroides,* and by the many specimens of other pseudoscorpions taken from merchandise at quarantine stations along the seacoast (Chamberlin 1938). Whether any of these latter man-introduced species have ever become established in a new area is not at present known.

As with other animal groups, the Illinois pseudoscorpion fauna contains some species that are widely distributed and even cosmopolitan, and others that are greatly restricted in their geographical ranges. It has seemed worth while to group most of the species taken in the state according to area of distribution. The remainder are recorded from only one or two counties and the data relative to distribution are possibly incomplete. It is possible that the rarity of some species is more apparent than real, and that the apparent rarity results from greatly restricted habitat niches or from an insufficient number of collections. Additional information relative to the distribution records of the various species may be found in the systematic section of this paper.

Widely Distributed Species

Ten species have been collected from a sufficient number of Illinois localities to indicate that they are widely distributed over the entire state. These include some of our very common forms: *Apochthonius moestus, Microbisium confusum, Lamprochernes oblongus, Parachernes squarrosus, Pselaphochernes parvus, Acuminochernes crassopalpus, Mirochernes dentatus, Chelifer cancroides, Idiochelifer nigripalpus,* and *Dactylochelifer copiosus.*

Microbisium brunneum, associated with bogs or swamps, has been taken at the northern and southern extremities of the state but not in areas between. Among the species infrequently collected, *Chthonius tetrachelatus* and *Illinichernes distinctus* have been taken from northern and southern localities.

Southern Species

Two species, *Heterochthonius multispinosus* and *Mundochthonius sandersoni,* have been taken from only the southern tip of the state. *Verrucaditha spinosa* has been found only in the Mississippi River drainage area in the south-central and southern parts of the state.

Northern Species

To date *Mundochthonius rossi* has been found only in the northern fourth of the state. In the same category are three other species that have been taken occasionally, *Dinocheirus pallidus, Dinocheirus solus,* and *Paisochelifer callus.*

Other Species

Six species that have been collected infrequently are known from central or north-central counties in the state, from the vicinity of Urbana, an area from which we have collected a large number of samples, or from widely separated local areas. Similar intensive collecting in other areas may show these species to have a much wider distribution in Illinois. The six species are *Chthonius ischnocheles, Lamprochernes minor, Reginachernes ewingi, Reginachernes lymphatus, Larca granulata,* and *Chelanops* (?) *corticis.*

COLLECTING METHODS

Collecting of large pseudoscorpions, especially those belonging to the suborder Monosphyronida, may be done by hand from the bark of trees and logs or by sifting soil, debris, and rotten wood. However, collecting of most pseudoscorpions in these ways is laborious and slow because of the low population density of some species and because of the small size, seclusive habits, and light color of other species, especially those of the suborders Heterosphyronida and Diplosphyronida.

The most efficient method for collecting pseudoscorpions is by the use of Berlese funnels, named after the Italian entomologist Berlese, who first used them extensively. A Berlese funnel is a very simple apparatus, fig. 3, consisting of a fairly long funnel suspended wide end up, with a screen placed about a third of the way down the funnel, with heat applied either around the upper portion of the funnel or over the top of the funnel, and with a container of preservative, preferably 80 per cent ethyl alcohol, around the small bottom opening. Leaf mold, bark scrapings, broken-up rotten

wood, and other material suspected of harboring pseudoscorpions is placed on the screen, the heat source is turned on, and after a day or so the pseudoscorpions leave the dried sample and migrate downward, dropping into the preservative.

half-inch mesh. Clumps of moss, leaves, sod, and pieces of wood or bark are torn up by hand into small fragments as they are put into the sieve; then this material is raked over the sieve and shaken, the sifted material being collected on a cloth or paper, fig. 4.

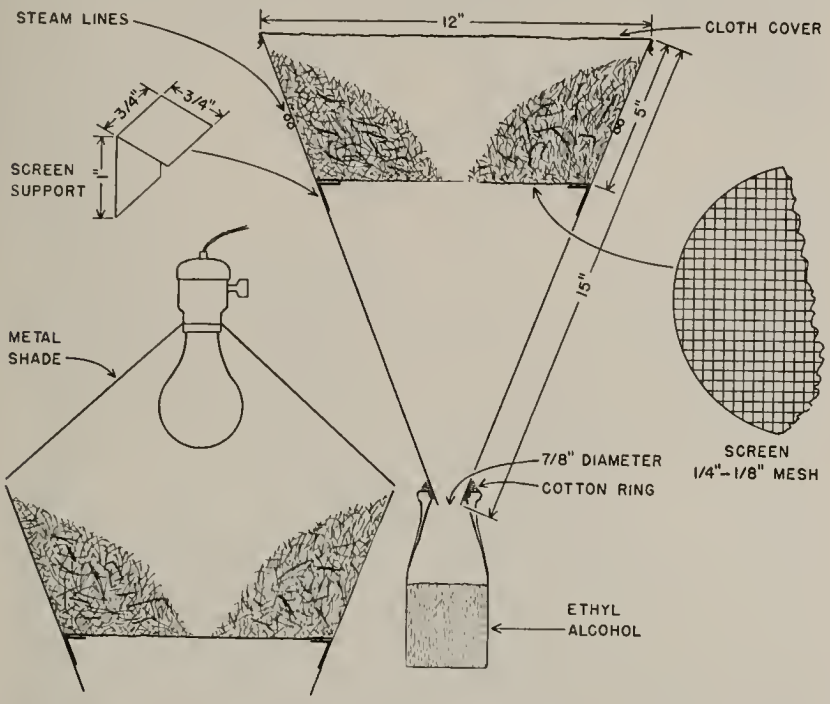

Fig. 3.—Sketch of a Berlese funnel, showing a diagrammatic view across the middle. The central figure shows an arrangement for a steam coil, the lower left for an electric light. The Berlese funnel provides the most efficient method for collecting pseudoscorpions and certain other animals.

Fig. 3 illustrates a funnel that has proved very satisfactory; it is 15 inches from top to bottom and the top has a diameter of 12 inches. The bottom opening, exactly seven-eighths inch in diameter, fits into a half-pint cream bottle, which makes an ideal container for the preservative. Three angled brackets or hangers are soldered inside the funnel to provide a rest for the screen, which is made of a quarter-inch or eighth-inch mesh hardware cloth; the mesh used depends upon the type of sample. A battery of several funnels in a rack will allow the collector to sample a hundred pounds or more of material in one operation.

Samples of leaf mold or other material are brought into the laboratory in cloth bags. Before being put in the funnel, each sample is sifted carefully through a screen sieve of

Pieces of wood or bark are knocked sharply against each other to dislodge any animals that might cling to them. The sifted material is then placed on the screen in the funnel and piled up around the sides to leave a small open space in the center of the screen, fig. 5. This central opening allows the easy migration of animals in the upper part of the sample down into the bottom part of the funnel. The funnel so loaded is then placed in the rack for support, the bottle with preservative is placed under the narrow end, and heat is applied. Funnels in position in rack are shown in fig. 6.

If steam is used as a source of heat, the small copper lines that conduct it act as a partial support for the funnel by encircling it about half way between the screen and the top; a piece of cloth is tied tightly over

Fig. 4.—Sifting Berlese samples. Preparatory to putting material in the funnel, bark and rotten wood are broken up and these and leaf mold sifted through a coarse screen. The siftings are put in the funnel.

the top of the funnel, fig. 3. If an electric light or a choke coil is used for heating, it should be hung directly over the center of the funnel and no cloth tied over the top. With a light or choke coil, it is often well to use a wide reflector that approximates in diameter the diameter of the top of the funnel.

Care must be taken not to heat the sample too rapidly. Otherwise, moisture will condense in the lower part of the funnel and trap many of the animals working their way toward the bottom, or the heat may kill many of the organisms before they have an opportunity to move out of the sifted material. A little experience furnishes the best gauge of the intensity of heat to be used. An application of heat sufficient to dry the sample in 4 or 5 days is usually satisfactory. As the sample dries, the organisms move out and downward, and finally drop into the bottle of preservative.

The Berlese funnel is extremely useful for collecting many animals in addition to

pseudoscorpions: groups of beetles, particularly Staphylinidae, thrips, Collembola, many groups of parasitic Hymenoptera, ants, millipedes, and centipedes, and a wide range of other minute animals that live in soil, surface cover, logs, or bark.

Samples for the Berlese funnel may be collected at any time of the year. If collected during the warm months, they should be brought to the laboratory and placed in the funnels within a day or two; otherwise considerable loss of population occurs within the samples. If collected during the cold months, they may be kept in cold storage for a week or two with little loss.

The following suggestions may prove helpful in picking up samples. For leaf mold samples, scrape off and discard the dry surface leaves and scoop up the lower, rotted layers of leaves together with an inch or two of the adjacent soil. You may encounter especially good samples where leaves have blown in along the edge of a log (see frontispiece). In such a situation, take some of the log bark with the sample. Collect rotten log samples in large hunks and break them up in the sieve. From either standing stumps or fallen logs in which the wood is still too hard to break up, collect the loose bark, as it is often quite productive. Fre-

Fig. 5.—Material to be sampled is placed on the sieve in the funnel and piled high around the edges; a small opening is left in the center. This arrangement allows an exit to the bottom for pseudoscorpions and other animals that might otherwise be trapped on top of the debris.

quently if you roll a log over, you may find animal runs under it; the debris and earth under and around these runs, together with animal nests, frequently give unusual catches.

Probably the most productive single type of sample is that taken from the interior of a standing hollow tree. At the bottom of the hollow you may find a foot or more of fine, rotten, woody material that you can scoop out by reaching through a break in the base of the tree. A 50- or 60-pound sample of this is almost sure to net many interesting forms. Occasionally you may collect a wet sample, such as sod from a marsh or debris from a stream edge. If you allow it to remain in the sack for a few days it will usually dry out enough to permit sifting. Allow winter samples to thaw and dry before you sift them.

PREPARATION OF MATERIAL

Most of the characters used in the identification of pseudoscorpions can be seen only in proper orientation of the specimen and under moderate to high magnifications. For this reason it is necessary to prepare pseudoscorpion specimens carefully so that they may be studied under the compound microscope.

The following method has been found very satisfactory. First, remove from the animal the two chelicerae, the two palps,

Fig. 6.—Funnels in position on rack. In this assembly, each funnel rests inside a double ring of copper tubing (as on funnel at extreme lower left) through which flows live steam. The steam produces the heat that dries out the sample and drives the animals out of it. Cotton or a small rag is tamped between the end of the funnel and the bottle of preservative to prevent escape of specimens.

one of the first, and one of the fourth legs. Leave these in alcohol while the rest of the body is being treated. Next, puncture the body by making a slitlike cut in the side of the abdomen; then place it in a 10 per cent solution of potassium hydroxide. This step is intended to dissolve the muscles and internal organs. Soak the body in cold hydroxide solution for several hours, or in hot solution (heated in a boiling water bath) for a few minutes. The exact amount of time will depend upon the size and darkness of the specimen and can be gauged after a little experience. The object is to clear the preparation in hydroxide long enough to dissolve out the internal material so that the preparation will be transparent, but not long enough to cause marked bleaching or decoloration of the parts. After soaking the preparation in hydroxide, remove it to distilled water and squeeze out the disintegrated viscera by gentle pressure with needle or forceps. Alternately press and release the abdomen several times; this manipulation will cause a pumping action that will remove most of the internal material. Allow the preparation to soak in a fresh water bath for about a day to remove the last traces of dissolved material. After the washing process, dip the body in 1/50 normal hydrochloric acid to neutralize the remaining hydroxide, and put it in 70 per cent alcohol. Next place the cleared preparation and the appendages previously removed in beechwood creosote. After they have completely cleared and dehydrated, mount them in Canada balsam or clarite.

In mounting the specimen, place the body with the ventral side uppermost and the two palps under one cover located a little to the left of the center of the slide, with sufficient room for the slide label to the left of the cover. Mount one of the palps with the dorsal side uppermost. Remove the chela from the other palp and spread the fingers wide apart. Mount this chela with the external or lateral surface uppermost. If the body and palps are heavy and thick, support the cover glass with short pieces of capillary tubing or short pieces of finely drawn glass rod. Mount the chelicerae and the previously removed legs under a smaller cover to the right of the first. Do not use supports under this cover since the cover glass should rest on the legs and press them out flat for measuring.

After clearing with hydroxide and before mounting some species or stages that are only lightly sclerotized, stain the body in acid fuchsin. Wash the material in dilute hydrochloric acid before putting it into this stain. After staining, wash the preparation in distilled water for some time to bleach out excess stain; then clear it in beechwood creosote and mount as directed above.

Label all slides clearly, indicating collection data and means of associating slide material with similar material in fluid. When an organism is identified, its name should be put on the slide label.

MORPHOLOGY

As an aid in the use of keys and the accurate identification of species, the important features of the external morphology of pseudoscorpions are outlined below. Additional information is available in the works of Chamberlin (1931*a*), Beier (1932*b*, *c*, *d*), and Roewer (1936, 1937).

Body

The body of a pseudoscorpion, fig. 7, is divided into two general parts, the cephalothorax and the abdomen. Both the body and the appendages bear many setae, the number and arrangement of which are of considerable taxonomic importance. In many species, the setae are slender and tapering, but in others they are modified in various ways. Commonly some of the setae are divided or branched at the tips and give somewhat club-shaped silhouettes; these setae are spoken of as clavate or subclavate in allusion to their general appearance. In some cases the branching occurs on only one side of a seta, and in others it extends down both sides of the seta to give a feathered effect. The cephalothorax is covered dorsally by a shield or carapace that is without segmentation, although in some cases one or two transverse furrows subdivide the surface of the carapace.

The mouth is at the anterior end of the cephalothorax and the feeding structure is retracted within a cavity in the anterior portion. In most species, one or more pairs of eyes are situated on or near the lateral margin of the cephalothorax; each eye has a single facet.

The abdomen consists of 12 segments, of which the last is greatly reduced and very inconspicuous. In some species, as indicated in fig. 7, the eleventh and twelfth segments

cannot be seen in strict dorsal view. Each segment of the abdomen bears a dorsal tergite and a ventral sternite, but in many forms each of these is divided medially to form lateral sclerites or areas called tergal and sternal halves. The chaetotaxy and sculpturing of the tergites and sternites are often useful in taxonomy. The tergites are usually regular in arrangement and shape, but the anterior sternites are modified as a result of the presence of the genital opening and its accompanying structures. Toward the lateral end of each third and fourth sternite is a stigma or spiracle through which air is taken into the tracheal system. In the males of a few species, the lateral ends of some of the tergites are modified to form keels. A pleural membrane covers the abdomen laterally between the sternites and tergites.

Appendages

A pseudoscorpion bears six conspicuous pairs of segmented appendages, all arising from underneath the cephalothorax: a short pair of pincer-like chelicerae; an elongate pair of palps, each ending in a pincer-like structure; and four pairs of legs, designated in descriptions by Roman numerals. Unlike most of the members of the Arachnida, the pseudoscorpions lack patellae on their appendages.

Chelicerae.—Each chelicera, fig. 8, is attached near the anterior end of the cephalothorax and consists of a basal segment or podomere extended anteriorly to

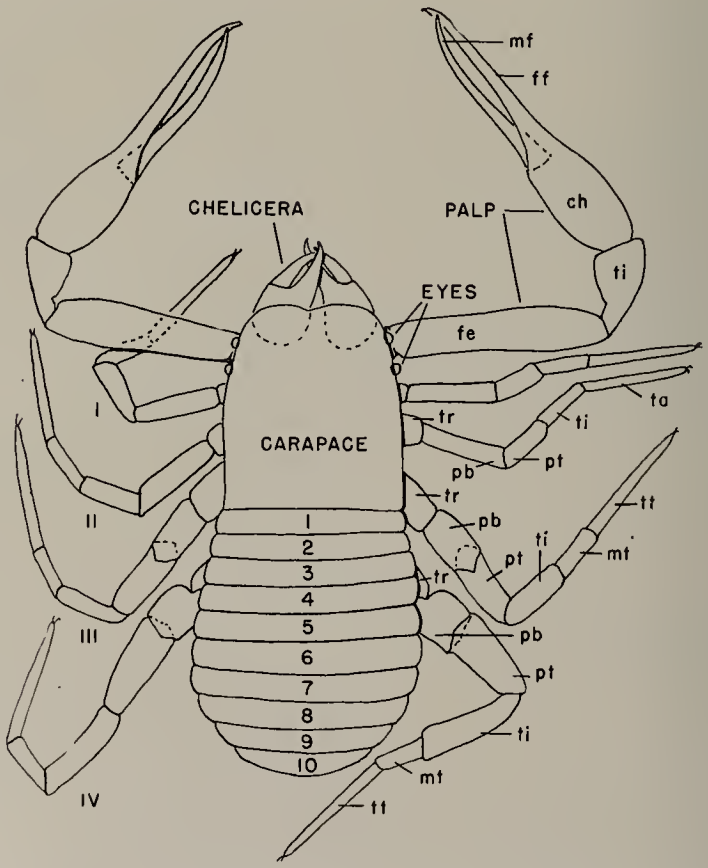

Fig. 7.—Sketch of a heterosphyronid pseudoscorpion to show the general body plan and appendages. The Arabic numerals designate segments of the abdomen; the Roman numerals indicate the four walking legs which arise from under the carapace on the venter of the cephalothorax. Abdominal segments 11 and 12 are not visible in a dorsal view of all species. Abbreviations used are *ch*, chela; *fe*, femur; *ff*, fixed chelal finger; *mf*, movable chelal finger; *mt*, metatarsus; *pb*, pars basalis; *pt*, pars tibialis; *ta*, tarsus; *ti*, tibia; *tr*, trochanter; *tt*, telotarsus. The coxa, which is basad to the trochanter on each leg, is not shown.

form a fixed finger and a second segment to form a movable finger. The dorsal surface of the base of the chelicera bears numerous setae. Those that are of major significance

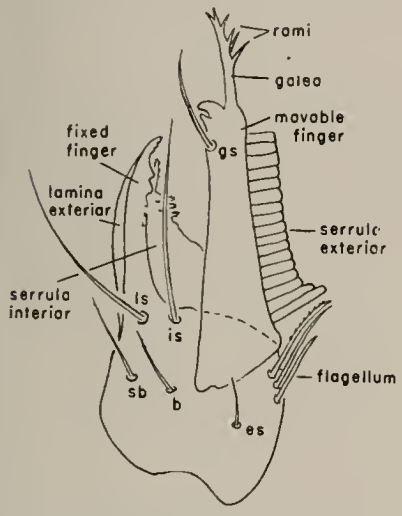

Fig. 8.—*Lamprochernes oblongus* ♀. Exterior or dorsal view of chelicera. The setae important in taxonomy are indicated by the standardized designations: *b*, basal seta; *es*, exterior seta; *gs*, galeal seta; *is*, interior seta; *ls*, laminal seta; *sb*, subbasal seta.

in taxonomy have been designated by letters as shown in fig. 8. The setae vary among species and genera in number, position, and size. The lateral margin of the subventral surface of the cheliceral base bears a flagellum that consists of a few to many modified setae. The fixed finger is usually smaller than the movable cheliceral finger, bears an apical tooth and several denticles along the inner margin, and is supplied with a longitudinal row of plates making up the serrula interior. With exception of the terminal three or four, the plates are frequently fused to form a so-called velum. The outer margin of the fixed finger often bears a longitudinal keel or riblike structure known as the lamina exterior. The movable cheliceral finger has a prominent serrula exterior, consisting of a row of ligulate plates extending along nearly the entire length of the finger. The movable finger terminates in an apical tooth and the inner margin bears either a subterminal lobe or a series of denticles. Near the end of the movable finger is inserted a galeal seta. In some groups, a conspicuous galea or spinneret is attached near the end of the movable finger. This galea is said to function in spinning silk discharged from silk gland ducts that open at the tips

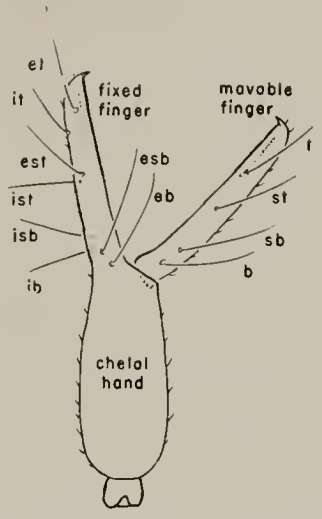

Fig. 9.—*Chelifer cancroides* ♀. Lateral view of chelal hand of palp. The standardized symbols used for the tactile setae of the movable finger are as follows: *b*, basal seta; *sb*, subbasal seta; *st*, subterminal seta; *t*, terminal seta. On the fixed finger, *e* indicates exterior and *i* indicates interior; either is used in connection with *t*, *sb*, and the like. Thus, *et* is the exterior terminal seta, while *it* is the interior terminal seta.

of the galeal branches or rami. When the galea is reduced or wanting, the ducts appear to terminate in a tubercle or directly on the surface near the tip of the finger, fig. 25*C*.

Palps.—The palps, fig. 7, are the most conspicuous appendages of the animal and are usually extended anteriorly. Each palp consists of several segments or podomeres: the coxa or maxilla, the trochanter, the femur, the tibia, and the chela. The chela has a movable finger that no doubt represents an additional segment. The characteristics of the palpal segments most useful in taxonomy are the general shape, the chaetotaxy and sculpturing, the absolute size, and the length-width ratio. The last is fairly constant within each species and use of it is becoming increasingly important for the separation of closely related species. The segments of the palp, especially the chela, in some cases show sexual dimorphism, the

chela of the male frequently being larger and stouter than that of the female.

The characteristics of the chela, fig. 9, are very important in classification. For a satisfactory study of the chela, a side view must be obtained. In such a view, the inner margins of both the fixed and movable fingers in most cases seem to be supplied with small contiguous teeth. In some cases, however, the teeth are alternately large and small, or variable in different parts of the margin. In the family Chernetidae, accessory teeth are borne on the outer and inner aspects of each finger near the marginal teeth. Great taxonomic significance is attached to the number and arrangement of the tactile setae of the fingers. In most species of pseudoscorpions the fixed finger has eight tactile setae and the movable finger has four, as shown in fig. 9. In other species, the number of tactile setae is greater or smaller. Each tactile seta is identified by the bulbous structure or areola from which it originates. One or both of the chelal fingers terminate in a venedens, or venom tooth, through which the venom is discharged. The venom duct can usually be traced proximally to the nodus ramosus, a dilation at the point where the small ducts form individual venom glands or reservoirs unite to form a single duct.

Legs.—With respect to the legs, several characteristics such as the number of segments, the nature of the joint between the pars basalis and the pars tibialis of the femur, and the nature of the terminal claws and chaetotaxy are important in classification. The number of segments in the legs is used as the basis for dividing the order Pseudoscorpionida into three suborders. In the suborder Monosphyronida, each leg has six apparent segments: coxa, trochanter, pars basalis and pars tibialis of the femur, tibia, and tarsus. In the suborder Diplosphyronida, the tarsus of each leg consists of the proximal metatarsus and the distal telotarsus, so that the leg appears to be made up of seven segments. In the suborder Heterosphyronida, each first and second leg has a single tarsal segment, whereas each third and fourth leg has two tarsal segments. The nature of the legs in the heterosphyronid pseudoscorpions is shown in fig. 7. In general, the legs do not show sexual dimorphism except occasionally in modifications of the tarsal claws of the first leg.

The coxae of the legs are more or less rigidly attached to the cephalothorax and can easily be seen in ventral view. In some groups of the Heterosphyronida, one or more of the pairs of coxae bear spines. Some species have a minute seta-bearing tubercle located medially between the third and fourth pairs of coxae.

Genitalia

In addition to the structures already described, the genital organs are of some importance in taxonomy. The external genitalia are located on the ventral surface of the abdomen in the region of the second and third abdominal segments. The second sternite forms an anterior genital operculum, and the third sternite forms a posterior operculum.

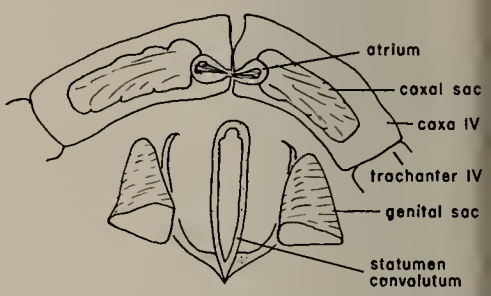

Fig. 10.—*Dactylochelifer copiosus* ♂. Important structures of the male genital complex of the highly specialized type found in the Cheliferidae.

In the female, the genital complex is relatively simple. When better known, it will probably assume greater significance in classification. In some species, a pair of seminal receptacles may be distinguished. These are often in the form of elongated tubules. In many females, perforated plates, known as cribriform plates, are present. The shape, position, and number of these plates are characters used in systematic work. The seminal receptacle and the cribriform plates may be seen in many females cleared with hydroxide.

In the male, the genital complex is more variable than in the female. The chaetotaxy of the opercula can be used on occasion as a specific character. In one group, the subfamily Cheliferinae of the family Cheliferidae, the genital organs of the male are highly modified and specialized, fig. 10. In males of certain genera of this group, each fourth coxa contains a coxal sac either with

or without a separated medial portion known as the atrium. The sclerotized statumen convolutum may or may not be invaginated anteriorly. When an anterior invagination occurs, the invagination contains a short sclerotized rod.

ACKNOWLEDGMENTS

This investigation has been made possible by the encouragement, co-operation, and assistance of many persons and organizations interested in the fauna of Illinois. Co-operative effort has resulted in the accumulation of a greater number of collections of pseudoscorpions than has ever been previously massed together at one time from any one state. The total number of collections made available for this study is about 350, of which two-thirds are from the collections of the Illinois Natural History Survey. Fifty-seven collections were taken by the writer. Other collections were loaned by the Illinois State Museum, the Chicago Natural History Museum, the American Museum of Natural History, the Museum of Comparative Zoology, and the Cornell University Museum. The two museums last named made available type specimens and material collected and recorded from Illinois by H. E. Ewing.

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CLASSIFICATION

The order Pseudoscorpionida or Chelonethida, embracing all of the pseudoscorpions, is set off from other orders of the class Arachnida by the following combination of characters: carapace unsegmented, fig. 7, covering the cephalothorax; abdomen segmented, not divided into pre- and post-abdomen; no sting on the abdomen; chelicerae small and chelate; palps large and chelate; respiration by means of simple tracheae.

The order is divided into three suborders, each of which is represented in the fauna of Illinois. These suborders in turn are divided into a system of superfamilies, families, and lower categories in order to facilitate grouping together related genera and demonstrate as far as possible natural relationships. The general classification followed here is that outlined summarily in papers by Chamberlin (1929*b*, 1930, 1931*a*) and extended or modified by Beier (1932*b*, *c*, *d*). These papers as a group give a comprehensive outline of the classification of the entire pseudoscorpion world fauna, together with full bibliographic treatment of the supergeneric names involved. Material in these papers is not repeated in the present paper, but instead the interested student is referred to them for further study.

The bibliographic citations given in the present paper for species or genera are not intended to be complete. They consist of references to the original description, to papers in which are given diagnoses more nearly complete than the original, to publications that contain important changes in taxonomic position or nomenclature, and to papers that have definite reference to the fauna of Illinois.

In this paper a complete diagnostic characterization of a species is given only for species that are new or for which no recent and complete description is available in the literature. For other species, a summary of

diagnostic characters is given and reference made to available extended descriptions.

Measurements throughout this paper are in millimeters.

Disposition of Material

Most of the Illinois material recorded here and not otherwise noted is in the collection of the Illinois Natural History Survey at Urbana, Illinois. Some material that belongs to other institutions is cited, and this usually is indicated by letters following the record. The letters used are as follows:

CH—Collection of C. Clayton Hoff, University of New Mexico, Albuquerque, N. Mex.

CM—Chicago Natural History Museum, Chicago, Ill.

CR—Collection of C. L. Remington, Yale University, New Haven, Conn.

CU—Cornell University, Ithaca, N. Y.

HV—Collection of H. J. Van Cleave, University of Illinois, Urbana, Ill.

IM—Illinois State Museum, Springfield, Ill.

JC—Collection of J. C. Chamberlin, Forest Grove, Ore.

MCZ—Museum of Comparative Zoology, Harvard College, Cambridge, Mass.

WS—Collection of Willis E. Snow, Urbana, Ill.

Systematic List

To date there are Illinois records for 26 species of pseudoscorpions. Of these, two are known only on the basis of literature records. They are indicated by an asterisk in the following list.

Suborder HETEROSPHYRONIDA
Family TRIDENCHTHONIIDAE
Subfamily Tridenchthoniinae
Tribe Verrucadithini
Verrucaditha spinosa (Banks)
Family CHTHONIIDAE
Subfamily Chthoniinae
Tribe Chthoniini
**Chthonius ischnocheles* (Hermann)
Chthonius tetrachelatus (Preyssler)
Apochthonius moestus (Banks)
Heterochthonius multispinosus Hoff
Mundochthonius rossi new species
Mundochthonius sandersoni new species

Suborder DIPLOSPHYRONIDA
Family NEOBISIIDAE
Subfamily Neobisiinae
Microbisium brunneum (Hagen)
Microbisium confusum Hoff
Family GARYPIDAE
Larca granulata (Banks)

Suborder MONOSPHYRONIDA
Family CHERNETIDAE
Subfamily Lamprochernetinae
Lamprochernes oblongus (Say)
Lamprochernes minor new species
Subfamily Chernetinae
Parachernes squarrosus new species
Pselaphochernes parvus Hoff
Reginachernes ewingi new species
Reginachernes lymphatus new species
Dinocheirus pallidus (Banks) new combination
Dinocheirus solus new species
Acuminochernes crassopalpus (Hoff) new combination
Mirochernes dentatus (Banks)
Illinichernes distinctus new species
**Chelanops* (?) *corticis* Ewing
Family CHELIFERIDAE
Subfamily Cheliferinae
Tribe Cheliferini
Chelifer cancroides (Linnaeus)
Idiochelifer nigripalpus (Ewing)
Paisochelifer callus (Hoff)
Tribe Dactylocheliferini
Dactylochelifer copiosus Hoff

The keys to suborders, superfamilies, and families are designed to accommodate the entire fauna known at present from America north of Mexico. Where used, the subfamily keys are designed for the same fauna. Keys to tribes and genera are intended primarily to resolve the fauna of the central and eastern United States and adjoining portions of Canada. Keys to species include those taken in Illinois and in addition a few species that are known from surrounding states and that ultimately may be found in this state.

KEY TO SUBORDERS

1. Each first and second leg with five segments exclusive of the coxa, and each third and fourth leg with six segments exclusive of the coxa, fig. 7. . . . . **Heterosphyronida, p. 429**
   All legs with the same number of segments 2
2. Tarsus of each leg divided into metatarsus and telotarsus, so that the leg has six segments exclusive of the coxa. . . . . **Diplosphyronida, p. 443**

Tarsus of each leg not divided, so that the leg has five segments exclusive of the coxa.....**Monosphyronida**, p. 449

Suborder HETEROSPHYRONIDA

Members of this suborder may be recognized by the single tarsal segment in the first and second legs and the two tarsal segments in the third and fourth legs. Both families represented in North America are known from Illinois. Both may be recognized by the extremely large chelicerae, fig. 11, as well as by the key characters.

KEY TO FAMILIES

Most abdominal tergites with a double row of closely spaced, short and stout setae extending completely across each segment; respiratory spiracles of third and fourth sternites obliquely placed and with differentiated guard sclerites, fig. 12*E*; body and palps very setose and granular; spines on coxae I and II, fig. 12*D*.....**Tridenchthoniidae**, p. 429

Abdominal tergites with only a single row of long and slender setae across each segment; respiratory spiracles of third and fourth sternites transversely placed and without guard sclerites differentiated from the sternites, fig. 15*D*; body and palps no more than weakly granular; Illinois species with spines on coxa I, fig. 15*C*, on coxa II, or on coxae II and III.....**Chthoniidae**, p. 431

TRIDENCHTHONIIDAE

Pseudoscorpions belonging to this group can be recognized by the obliquely placed stigmata or respiratory spiracles, fig. 12*E*, that are guarded by well-developed sclerites. Some exotic genera have only a single row of stout setae across the abdominal tergites.

In America north of Mexico the family is represented by a single genus, *Verrucaditha*. Diagnosed in relation to the world fauna by Chamberlin & Chamberlin (1945), this genus is placed in the subfamily Tridenchthoniinae and tribe Verrucadithini.

1. *VERRUCADITHA* Chamberlin

Alura Chamberlin (1926, p. 334). Genotype, by original designation: *Chthonius spinosus* Banks. (Name preoccupied by *Alura* Moeschler 1883.)

Verrucaditha Chamberlin (1929*b*, p. 59). New name for *Alura* Chamberlin.

Verrucaditha Chamberlin. Chamberlin & Chamberlin (1945, p. 22).

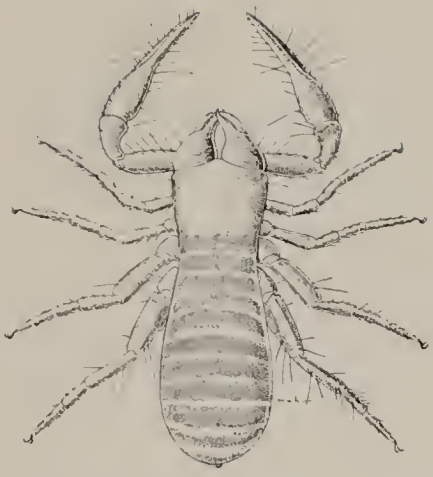


Fig. 11.—*Apochthonius moestus*, an example of the suborder Heterospbyronida and the family Chthoniidae.

Members of this genus possess movable chelal fingers on which the marginal teeth are broad, rounded, and contiguous. Only one nearctic species is known.

Verrucaditha spinosa (Banks)

Chthonius spinosus Banks (1893, p. 67).

Verrucaditha spinosa (Banks). Chamberlin (1929*b*, p. 59), Chamberlin & Chamberlin (1945, p. 24), Hoff (1946*b*, p. 103).

In general, the following combination of characteristics serves to identify adults without mounting: body length 1.0–1.3 mm.; carapace with about 100 heavy lanceolate investing setae, fig. 12*B*, and with the anterior carapacic margin distinctly bilobed; the pair of tactile setae on the dorsum of each chelal hand removed from the proximal margin of the hand by about one-fourth its length, figs. 12*A*, 12*C*; spines on coxae I and II, fig. 12*D*. For more extensive descriptions of this species, the reader is referred to Chamberlin & Chamberlin (1945) and Hoff (1946*b*).

DEUTONYMPH.—The following description is based on one individual. This stage has not been described previously in the literature. The deutonymph in general resembles the adult, length 0.82 mm., greatest width of abdomen 0.35 mm. Carapace anteriorly bilobed, each lobe with four stout marginal setae; eyes conspicuous. Chelicera very similar to that of the tritonymph as previously reported (Hoff 1946*b*) except that there are three rather than two galea-like processes near the end of the movable

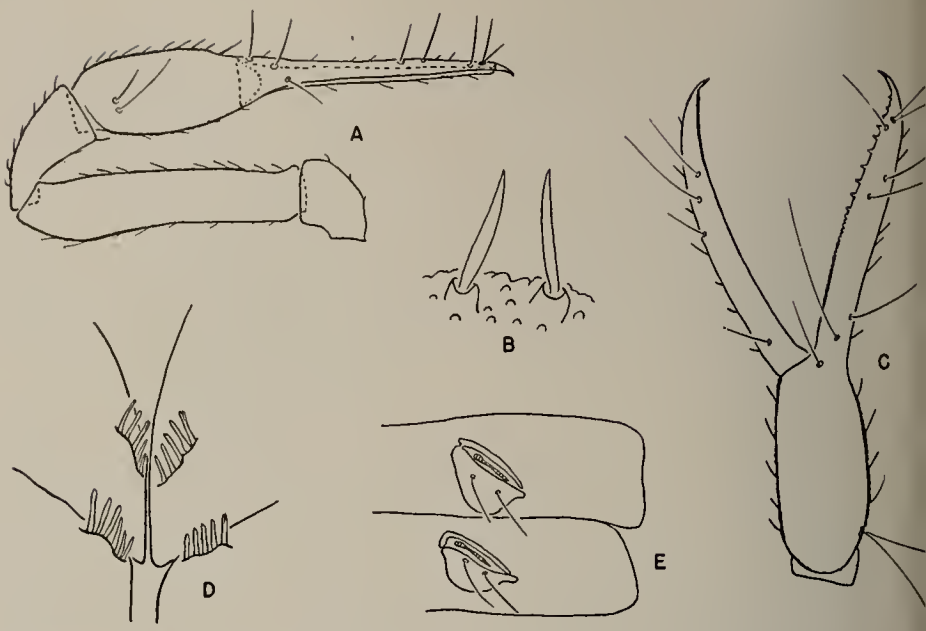


Fig. 12.—*Verrucaditha spinosa*. *A*, dorsal view of palp ♂ ; *B*, setae of carapace; (exterior view of chela, ♂ ; *D*, coxal spines, ♂. *E*, stigmata or respiratory spiracles, ♀.

finger and 10 rather than 14 plates in the serrula exterior. Three to five spines occur on each of coxae I and II. Segments of palps weakly granulate and light yellow in color. Palp with femur 0.205 mm. long, 0.07 mm. wide; tibia 0.125 mm. long, 0.075 mm. wide; chela 0.4 mm. long, 0.082 mm. wide; depth of hand equal to width, length about 0.13 mm.; movable finger 0.26 mm. long. Fixed chelal finger with seven tactile setae, *ds* and *et* near distal end, *it* and *est* near center, two setae near base of finger, and one (*isb* or *ib*) a little proximad to the mid-point of the dorsum of the hand; movable finger with two tactile setae near center. Marginal teeth similar in appearance to those of the adult; movable finger with 24 marginal teeth; fixed finger with 11 acute and well-separated teeth in the distal half of the finger and 10 more nearly contiguous teeth on the proximal half of the finger margin.

DISTRIBUTION.—*Verrucaditha spinosa* does not occur abundantly in Illinois. Of eight records, four are from Adams County and one each from Brown, Jackson, Jersey, and Madison counties. The species is widely distributed in the central and southeastern part of the United States as shown by existing records (Chamberlin & Chamberlin 1945).

This species usually occurs in debris ar decaying wood of old stumps and logs deciduous forests. One collection was take from "ground cover" and one from falle needles under an eastern redcedar tr (*Juniperus virginiana* Linnaeus).

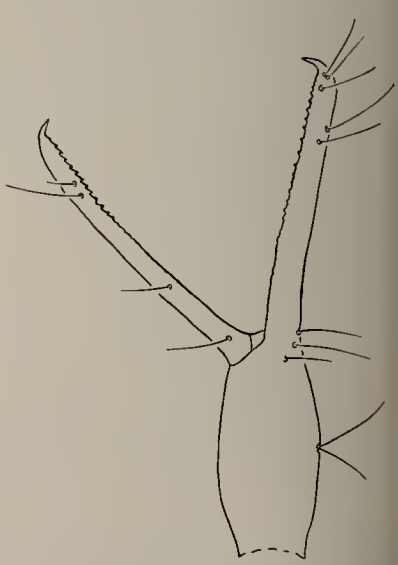


Fig. 13.—*Chthonius ischnocheles*. Latera view of chela. (After Chamberlin.)

Illinois Records.—ADAMS COUNTY: 1943, C. C. Hoff, 1 ♂; Coe's Spring, Oct. 28, 1944, Rev. Edbert Long, 1 ♂, 2 ♀ (1 ♂, 1 ♀, CH). EDWARDSVILLE: Sept. 24, 1943, Ross & Sanderson, 1 immature. GRAFTON: Sept. 30, 1943, Ross & Sanderson, 1 ♂. MAKANDA: Oct. 12, 1933, Frison & Ross, 1 ♂. QUINCY: southwest of, July 8, 1944, C. C. Hoff, 1 immature (CH); south of, July 8, 1944, C. C. Hoff, 1 ♂. SILOAM: Siloam Springs, Aug. 29, 1945, C. C. Hoff, 1 immature (CH).

CHTHONIIDAE

Species belonging to this family may be recognized by the transversely placed spiracles that are not accompanied by separate guard sclerites, fig. 15*D*. All four Illinois genera belong to the subfamily Chthoniinae and the large tribe Chthoniini. Members of this tribe possess two tactile setae (*ish* and *ib*), figs. 14*A*, 15*A*, in a transverse pair on the dorsum of each chelal hand.

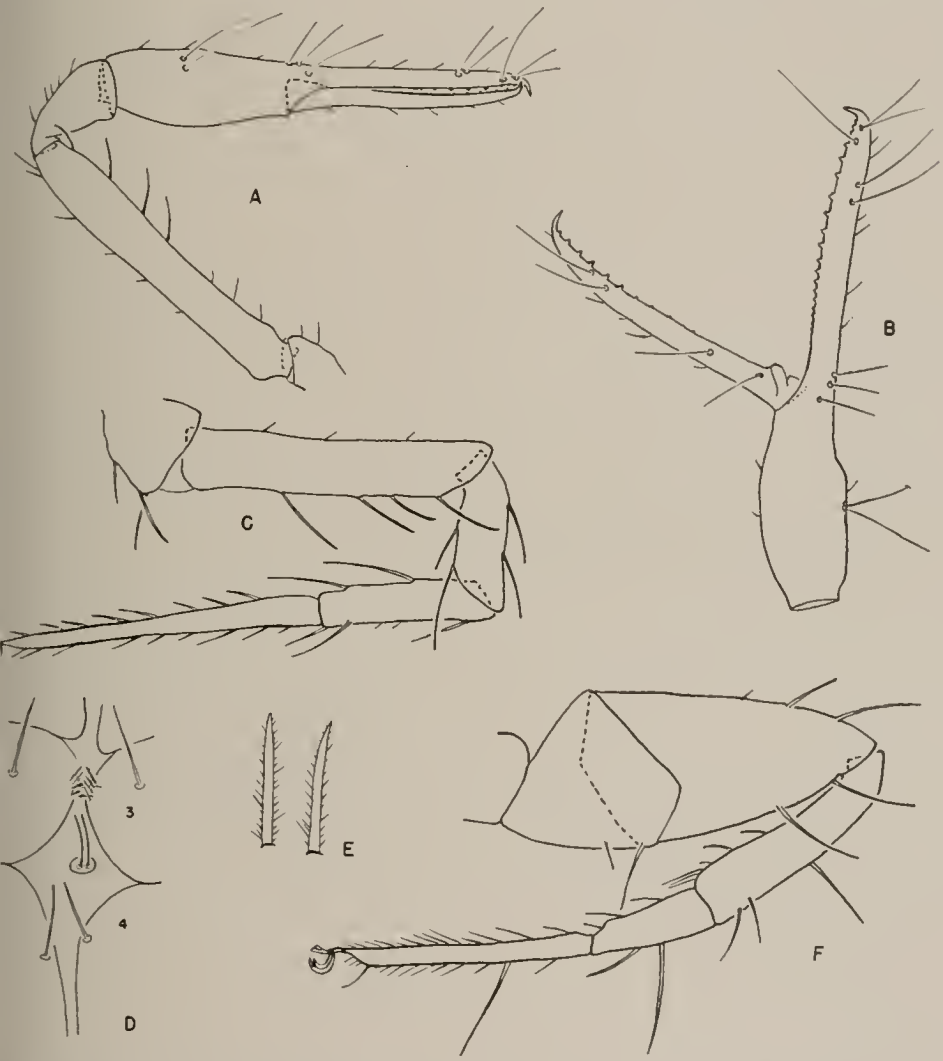


Fig. 14.—*Chthonius tetrachelatus*. *A*, dorsal view of palp, ♂; *B*, external view of chela, ♀; *C*, first leg, ♂; *D*, parts of coxae II, III, and IV, showing the spines of coxa III and the tubercle and setae, ♀; *E*, two isolated coxal spines enlarged to show structure, ♂; *F*, fourth leg, ♂, drawn to a much smaller scale than first leg, *C*. If the specimen is shrunken in mounting, the tubercle and setae in *D* are difficult to see.

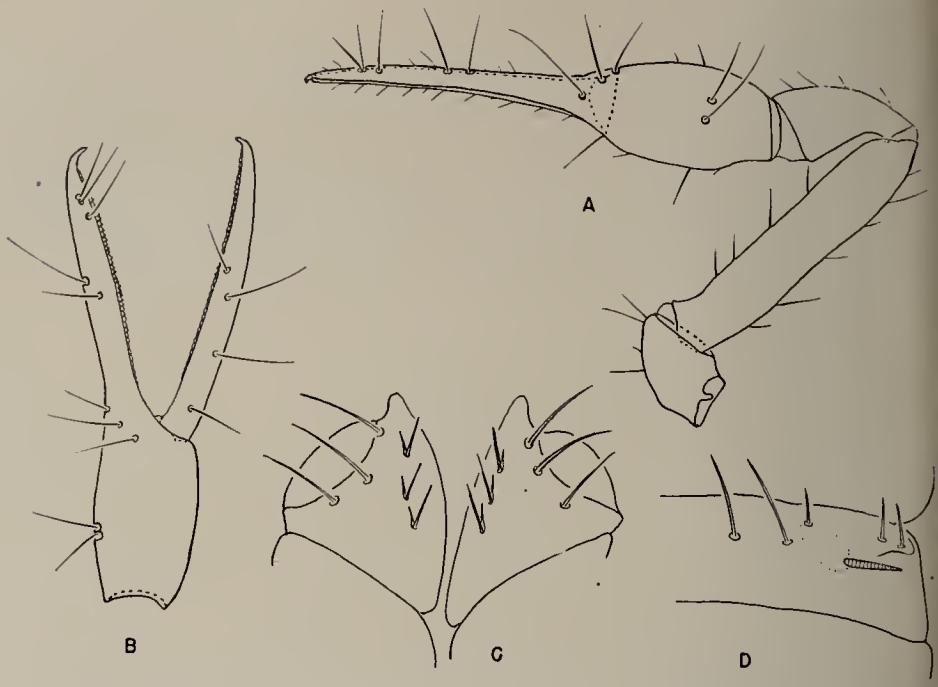


Fig. 15.—*Apochthonius moestus*. *A*, palp in dorsal view, ♀ ; *B*, chela in lateral view, ♀ ; *C*, spines of coxa I, ♀ ; *D*, stigma on sternite 3, ♀.

KEY TO GENERA

1. Eyes absent; body length 2.3 mm.....
.....**6. Genus? packardi**
Eyes present, or, if wanting or vestigial, body length less than 1.5 mm.....2
2. Mesal portion of coxa I containing a group of well-separated spines, often in a row, each spine arising from an elongate slit, fig. 15*C*; intercoxal tubercles not present on the mid-line between any of the coxae.....3
Mesal portion of coxa I without such spines; instead a comb of short spines or a group of short, feathered spines present on the mesal region of coxa II or coxae II and III, figs. 14*D*, 17*E*; a minute intercoxal tubercle bearing two small setae present between the junction of coxae III and IV.....4
3. Teeth along margins of chelal fingers short and broad, arranged close together, fig. 15*B*.....**3. Apochthonius**
Chelal teeth widely spaced, alternately large and small, fig. 16*C*.....
.....**4. Heterochthonius**
4. A group of well-separated, short, feathered spines present on each mesal margin of coxae II and III, figs. 14*E*, 14*D*.....
.....**2. Chthonius**
Short coxal spines in the form of a comb, frequently united at bases, present only on the mesal portion of coxa II, figs. 17*D*, 18*D*.....**5. Mundochthonius**

2. *CHTHONIUS* C. Koch

Chthonius C. Koch (1843, p. 76). Genotype, by subsequent designation of Simon (1879): *Obisium orthodactylum* Leach.

Chthonius C. Koch. Chamberlin (1929*b*, p. 69), Chamberlin (1931*a*, p. 212), Beier (1932*b*, p. 43).

The genus *Chthonius* is characterized by the presence of an intercoxal tubercle, spines on coxae II and III, and simple teeth (not always contiguous) on the inner margins of the chelal fingers, figs. 14*B*, 14*D*. Several subgenera have been outlined in the literature. Of these subgenera, two are represented in Illinois, each by one species. Other species in the genus are known from Georgia, North Carolina, and California.

KEY TO SUBGENERA AND SPECIES

Teeth of inner margins of chelal fingers large, acute, uncrowded, and somewhat conical and recurved; chelal hand appearing evenly rounded on the dorsal margin as viewed from the side, fig. 13. Subgenus *Chthonius*
.....**ischnocheles**

Teeth of inner margins of chelal fingers long and pointed, often well separated; in lateral view, the chelal hand displays a depression between the tactile seta of the dorsum of the hand and the finger base, fig. 14*B*. Subgenus *Ephippiochthonius*. . . . . **tetrachelatus**

Subgenus *Chthonius* C. Koch

Chthonius s. str. C. Koch. Beier (1932*b*, p. 47).

Members of this subgenus may be recognized by the large, acute, and retroconical (pointing toward the base of the finger) marginal teeth of the chelal fingers. The marginal teeth in some species are well separated, at least in the distal part of the fixed finger. The chelal hand has an evenly rounded contour as viewed from the side, there being no dorsal depression near the base of the fixed finger. A single species of the subgenus has been taken in the Illinois fauna.

Chthonius ischnocheles (Hermann)

Chelifer ischnocheles Hermann (1804, p. 113).
Chthonius Pensylvanicus Hagen (1869, p. 52).
Chthonius pennsylvanicus Hagen. Ewing (1911, p. 80).
Chthonius ischnocheles (Hermann). Chamberlin (1929*b*, p. 71).
Chthonius (Chthonius) ischnocheles (Hermann). Beier (1932*b*, p. 48).

The species can be recognized from the characters given in the keys. The following additional characters are listed by Beier (1932*b*). Cephalothorax with 20 to 24 setae, the posterior margin with four to six equally long setae. Setae of the tergites: 4:4:4:4:6:6:6:6. Marginal teeth of the palpal fingers pointed, triangular in outline, and directed somewhat toward the base of the finger, fig. 13. Teeth of movable finger almost as strong as those of the fixed finger. Coxa II with at least 14 spines, coxa III with at least 9 spines. Intercoxal tubercle with two setae. Body length 1.6–2.4 mm.; palpal hand 0.5 mm. long, 0.27 mm. wide; finger length 0.85 mm.

DISTRIBUTION.—Ewing (1911) reported a single individual of this species from Hillery, Vermilion County, Illinois. No additional collections have been secured in our recent survey. The species has a wide distribution and is reported from many localities in Europe and from the northeastern part of the United States (Chamberlin 1929*b*). More Illinois records of this species would be useful.

Subgenus *Ephippiochthonius* Beier

Ephippiochthonius Beier (1930*a*, p. 323). Genotype, by present designation: *Scorpio tetrachelatus* Preyssler.

Members of this subgenus are recognized by the presence of 18 setae on the carapace, of which two are on the posterior margin; in lateral view, the chelal hand displays a depression between the tactile setae of the dorsum of the hand and the finger base, fig. 14*B*; teeth of chelal fingers are long, pointed, and usually well separated. A single species has been taken in Illinois.

Chthonius tetrachelatus (Preyssler)

Scorpio tetrachelatus Preyssler (1790, p. 59).
Chthonius tetrachelatus var. *maculatus* Menge. Stecker (1875, p. 314).
Chthonius longipalpus Banks (1891, p. 164).
Chthonius longipalpus Banks. Ewing (1911, p. 80).
Chthonius tetrachelatus (Preyssler). Vachon (1941*a*, p. 442).
Chthonius (Ephippiochthonius) tetrachelatus (Preyssler). Hadzi (1933*a*, p. 139; 1933*b*, p. 179), Hoff (1946*b*, p. 109).

Individuals of this species may be recognized by the characteristics given in the key, especially by the shape of the chelal hand and the nature of the marginal teeth of the chelal fingers, fig. 14*B*. No detailed description is included here, since the species has been treated recently and adequately by Hadzi (1933*a*, 1933*b*) and Vachon (1941*a*, 1941*b*). The adults and most nymphs (but not the protonymph) in our collections agree well with those described by Vachon, except that the palpal segments of our specimens appear to be a little more slender than indicated in Vachon's drawings.

I have examined a single protonymph that apparently belongs to this species. Unfortunately, this protonymph was not associated with adults and, as a result, the identification may be questioned. The individual differs radically from the form described by Vachon (1941*a*, 1941*b*) as the protonymph of *tetrachelatus*. Possibly Vachon studied the last larval stage rather than the first nymphal stage, or protonymph, since his drawings do not appear to be made of animals sufficiently developed to be protonymphs. Because of limited material and questionable identification, the protonymph I have examined that apparently belongs to this species is not described here.

DISTRIBUTION.—*Chthonius tetrachelatus* was taken by the writer in 11 collections in

the vicinity of Quincy, Adams County. In addition, a single individual was present in a collection made by Henry Dybas near Mooseheart, Kane County. The only other record available is from Herod, Pope County, and consists of the questionable protonymph mentioned above. The species has a wide distribution in Europe and northern Africa and has been reported from the New England states and Indiana in the United States (Chamberlin 1929*b*).

Ecological data are available only for the collections taken in Adams County. Here the species was found chiefly in debris and leaf mold in woods, frequently in the vicinity of limestone outcroppings along the bluffs of the Mississippi River.

Illinois Records.—HEROD: Oct. 12, 1933, ground cover in woods, Frison & Ross, 1 protonymph. MOOSEHEART: Sept. 1, 1939, Henry Dybas, 1 specimen (CM). QUINCY: Oct. 10, 1943; Nov. 1, 1943; July 2, 1944; July 29, 1944; Aug. 13, 1944; all by C. C. Hoff, many specimens.

3. *APOCHTHONIUS* Chamberlin

Apochthonius Chamberlin (1929*b*, p. 66). Genotype, by original designation: *Chthonius moestus* Banks.

Apochthonius Chamberlin (1929*c*, p. 152).

Apochthonius Chamberlin. Beier (1932*b*, p. 41).

The genus includes pseudoscorpions with the following characteristics: 22 to 24 setae on the carapace; four eyes; each coxa I with three simple seta-like coxal spines, each spine originating from a cleft or fissure on the surface of the coxa, fig. 15*C*; intercoxal tubercle lacking; chelicera with seven setae on the hand; marginal teeth of the chelal fingers small, contiguous, and occupying nearly the full length of the finger margins, fig. 15*B*. One species, *moestus*, occurs in eastern North America; two others in the north Pacific Coast region, *occidentalis* Chamberlin and *intermedius* Chamberlin.

Apochthonius moestus (Banks)

Chthonius moestus Banks (1891, p. 165).

Apochthonius moestus (Banks). Chamberlin (1929*b*, p. 67), Hoff (1944*a*, p. 125; 1945*c*, p. 311; 1946*b*, p. 105).

This species can be separated easily from other Illinois pseudoscorpions by the three coxal spines on each coxa I and by the small and contiguous marginal teeth on the chelal fingers. Diagnostic characteristics are illustrated in figs. 11 and 15.

DISTRIBUTION.—*Apochthonius moestus* is widely distributed over Illinois; it has been identified in 65 collections from various parts of the state. The species appears to be distributed over most of the United States east of the Great Plains region.

One of the more common pseudoscorpions in the eastern and central states, *moestus* is found very abundantly in the litter and debris on the ground in deciduous woods. It has also been taken from beneath the bark of decaying logs, in moss, and in mammal nests.

Illinois Records.—Many specimens, taken throughout the year, are from Alhambra, Alto Pass, Anna, Bond County, Burksville, Cadiz, Charleston, Collinsville, Danville, Dolson (Clarksville), Eichorn, Fountain Bluff, Ganntown, Geff, Giant City State Park, Grafton, Herod, Kellerville, La Rue (Wolf Lake), Marshall, Monticello, New Salem State Park, Oakwood, Pocahontas, Quincy, Sherman, Starved Rock State Park, Urbana, Vienna, West Vienna, and White Heath.

4. *HETEROCHTHONIUS* Chamberlin

Heterochthonius Chamberlin (1929*c*, p. 153). Genotype by original designation: *Apochthonius (Heterochthonius) crosbyi* Chamberlin.

Heterochthonius Chamberlin. Hoff (1945*c*, p. 313).

The members of this genus are similar to members of the genus *Apochthonius* but differ in having the marginal teeth of the chelal fingers with at least the distal teeth well separated and typically composed of alternating large and small teeth; coxa I with three to six spines; carapace with 20 to 24 setae. Only two species are known in the genus, both from the eastern half of the United States, but only one is recorded from Illinois.

KEY TO SPECIES

Body length 1.6–2.0 mm.; length-width ratio of palpal femur greater than 4:5, usually greater than 5:0 ..... **multispinosus**

Body length 1.3 mm.; length-width ratio of palpal femur 3:8 ..... **crosbyi**

Heterochthonius multispinosus Hoff

Heterochthonius multispinosus Hoff (1945*c*, p. 314).

This is the only pseudoscorpion thus far found in Illinois that has four to six (in one specimen, three) spines on each coxa I and

the marginal teeth of the chelal fingers well spaced and alternately large and small, figs. 16*B*, 16*C*.

MALE.—The present individuals agree well with the type specimens. A study of specimens from Duke Forest, the type locality, and from Illinois shows that much greater variation occurs than was indicated in the study of the restricted type material. The following measurements and observations are based on five males from Illinois. Body length 1.65–1.85 mm.; carapace 0.46–0.51 mm. long, 0.43–0.47 mm. wide; abdomen 1.15–1.35 mm. long, 0.65–0.7 mm. wide. Chelicera 0.33–0.39 mm. long, base 0.19–0.24 mm. wide; movable finger 0.2–0.235 mm. long; serrula exterior with 16 to 18 ligulate plates. Palp with trochanter 0.21–0.215 mm. long, 0.12–0.125 mm. wide; femur 0.65–0.73 mm. long, 0.12–0.13 mm. wide, length 5.4 to 5.65 times the width (ratio of 5.1:1 in type specimens, but ratio in other Duke Forest specimens similar to that in many individuals from Illinois); tibia 0.26–0.29 mm. long, 0.13–0.145 mm. wide, length 1.9 to 2.05 times the width; chela 0.93–1.05 mm. long, 0.185–0.2 mm. wide, length 5.0 to 5.25 times the width; chelal hand 0.37–0.42 mm. long, 0.195–0.205 mm. deep; movable chelal finger 0.56–0.65 mm. long (a little less than in the type specimens) and light yellow in color (not reddish-brown as given in the original description). First leg with pars basalis 0.36–0.4 mm. long, 0.07–0.075 mm. deep; pars tibialis 0.16–0.195 mm. long, 0.065–0.073 mm. deep; tibia 0.21–0.24 mm. long, 0.05–0.057 mm. deep; tarsus 0.4–0.43 mm. long, 0.045–0.05 mm. deep. Fourth leg with entire femur 0.57–0.63 mm. long, pars basalis 0.2–0.23 mm. deep; pars tibialis 0.18–0.215 mm. deep; tibia 0.37–0.425 mm. long, 0.08–0.087 mm. deep; metatarsus 0.2–0.225 mm. long, 0.65–0.70 mm. deep; telotarsus 0.39–0.45 mm. long, 0.04–0.044 mm. deep; tactile seta removed from the proximal margin of the tarsus by 0.12–0.13 mm., being farther removed from the proximal margin than indicated for the type material (Hoff 1945*c*).

FEMALE.—In general, the female resembles the male except that the body and appendages are longer and that many of the segments of the appendages are stouter. The following measurements are of two females, each measurement of one followed in parentheses by the corresponding measurement of the other. Body length 1.98 (1.85) mm.; carapace 0.53 (0.55) mm. long, 0.49 (0.52) mm. wide; abdomen 1.45 (1.28) mm. long, 0.56 (0.7) mm. wide. Chelicera with finger 0.285 (0.26) mm. long, serrula exterior with 17 (19) plates. Palp with trochanter 0.26 (0.26) mm. long, 0.145 (0.145) mm. wide; femur 0.81 (0.79) mm. long, 0.156 (0.15) mm. wide; tibia 0.335 (0.31) mm. long, 0.175 (0.16) mm. wide; chela 1.18 (1.15) mm. long, 0.245 (0.245) mm. wide; chelal hand 0.495 (0.48) mm. long, 0.255 (0.25) mm. deep; chelal finger 0.7 (0.68) mm. long. First leg with pars basalis 0.425 (0.405) mm. long, 0.087 (0.078) mm. deep; pars tibialis 0.2 (0.—) mm. long, 0.08 (0.08) mm. deep; tibia 0.255 (0.25) mm. long, 0.061 (0.062) mm. deep; tarsus 0.46 (0.43) mm. long, 0.053 (0.051) mm. deep. Fourth leg with pars basalis 0.255 (0.22) mm. deep; pars tibialis 0.24 (0.2) mm. deep; entire femur 0.7 (0.67) mm. long; tibia 0.475 (0.44) mm. long, 0.105 (0.09) mm. deep; metatarsus 0.258 (0.24) mm. long, 0.08 (0.07) mm. deep; telotarsus 0.48 (0.46) mm. long, 0.053 (0.045) mm. deep; tactile seta 0.13 (0.135) mm. from proximal margin of tarsus.

TRITONYMPH.—Much like the adult but smaller and segments of the appendages stouter. Body about 1.4 mm. long; carapace with both length and width about 0.4 mm.; abdomen 1.1 mm. long, about 0.65 mm. wide. Chelicera with movable finger stouter than in the adult and with a subterminal nodule in which terminate a number of gland ducts; serrula exterior with 16 ligulate plates; movable finger 0.18 mm. long, basal setae apparently fewer than in the adult. Palpal segments conspicuously stouter than in the adult, color a little lighter, setae not so strongly developed. Palp with trochanter 0.19 mm. long, 0.1 mm. wide; both femora 0.5 mm. long, one femur 0.115 mm. wide, the other 0.12 mm. wide; tibia 0.215 mm. long, about 0.13 mm. wide; chela 0.78 mm. long, 0.175 mm. wide; chelal hand 0.29 mm. long, 0.17 mm. deep; movable finger 0.51 mm. long. Marginal teeth of chelal fingers much as in the adult except fewer in number on the fixed finger and with less difference in size between the alternating large and small teeth. Movable finger with three tactile setae: *st* not much distad from the mid-point of the finger, *t* about two areolar diameters distad from *st*, *b* removed from the proximal finger margin by less than twice the width of the finger at the level

of *b*. Fixed finger with *est* about midway between *ist* and the finger tip; *it* about three areolar diameters distad from the level of *est*; other setae much as in the adult except one of the setae on the dorsum of the chelal hand is wanting. The segments of the legs generally shaped as in the adult except much smaller and stouter; telotarsus of fourth leg subfusiform. First leg with pars basalis 0.258 mm. long, 0.066 mm. deep; pars tibialis 0.133 mm. long, 0.061 mm. deep; tibia 0.145 mm. long, 0.048 mm. deep; telotarsus 0.285 mm. long, 0.042 mm. deep. Fourth leg with entire femur 0.42 mm. long, 0.158 mm. deep; tibia 0.285 mm. long, 0.072 mm. deep; metatarsus 0.152 mm. long, 0.06 mm. deep; telotarsus 0.292 mm. long, 0.046 mm. deep; tactile seta removed from the proximal margin of the telotarsus by about 0.075 mm.

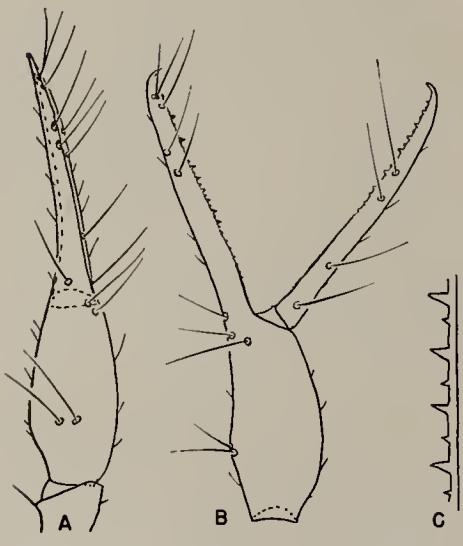


Fig. 16.—*Heterochthonius multispinosus* ♂. *A*, chela, dorsal view; *B*, chela, lateral view; *C*, more distal marginal teeth of chela.

DISTRIBUTION.—This species is infrequent in Illinois, having been taken in only four collections. Two of these collections were from Pope County, one from Jackson County, and one from Hardin County. The only other record is from Duke Forest, Durham, North Carolina, the type locality. The number of specimens found in the Illinois collections is small: four males, two females, and one tritonymph.

This species has been taken only from ground cover, both in Illinois and in North Carolina.

Illinois Records.—CADIZ: Nov. 6, 1942, Ross & Sanderson, 2♂, 1♀. FOUNTAIN BLUFF: Feb. 22, 1933, Ross & Mohr, 1 immature. HEROD: Oct. 12, 1933, Frison & Ross, 2♂ (1♂, CH); Oct. 18, 1944, Ross & Sanderson, 1♀.

Heterochthonius crosbyi (Chamberlin)

Apochthonius (Heterochthonius) crosbyi Chamberlin (1929*c*, p. 153).

This species is known only from North Carolina, but may eventually be found in Illinois.

Recently the writer has been able, through the kindness of Henry Dietrich of the Cornell University Agricultural Experiment Station, to examine the holotype of *Heterochthonius crosbyi*. A comparison of *crosbyi* and *multispinosus* indicates that *crosbyi* is much smaller than *multispinosus* and that there is no possibility of confusing the two species. The following measurements were secured of the type of *crosbyi* and serve to supplement descriptive material given in the literature: body length 1.3 mm. (not 1.5 mm. as recorded in the original description, Chamberlin 1929*c*); each palp with femur 0.5 mm. long and 0.13 mm. wide; chela somewhat damaged but apparently about 0.78 mm. long; movable chelal finger 0.54 mm. long.

5. *MUNDOCHTHONIUS* Chamberlin

Mundochthonius Chamberlin (1929*b*, p. 64). Genotype, by original designation: *Mundochthonius erosidens* Chamberlin.

Mundochthonius Chamberlin. Beier (1932*b*, p. 36).

Members of the genus *Mundochthonius* may be recognized by the simple chelal teeth; each tergite with usually four to eight setae; intercoxal tubercle with two setae; only coxa II with spines, figs. 17*D*, 17*E*. Previously, the genus was known from a number of species recorded from the western United States and from Japan. The two Illinois species described below constitute the first records of this genus east of the Rockies in North America.

KEY TO SPECIES

Palpal femur longer than 0.3 mm.; chela longer than 0.5 mm.; length of palpal chela (with an occasional exception) at least 4.2 times the width; mesal comb of coxa II irregularly fused at base, figs. 17*D*, 17*E* ..... **rossi**

Palpal femur always shorter than 0.3 mm.; chela shorter than 0.5 mm.; length of palpal

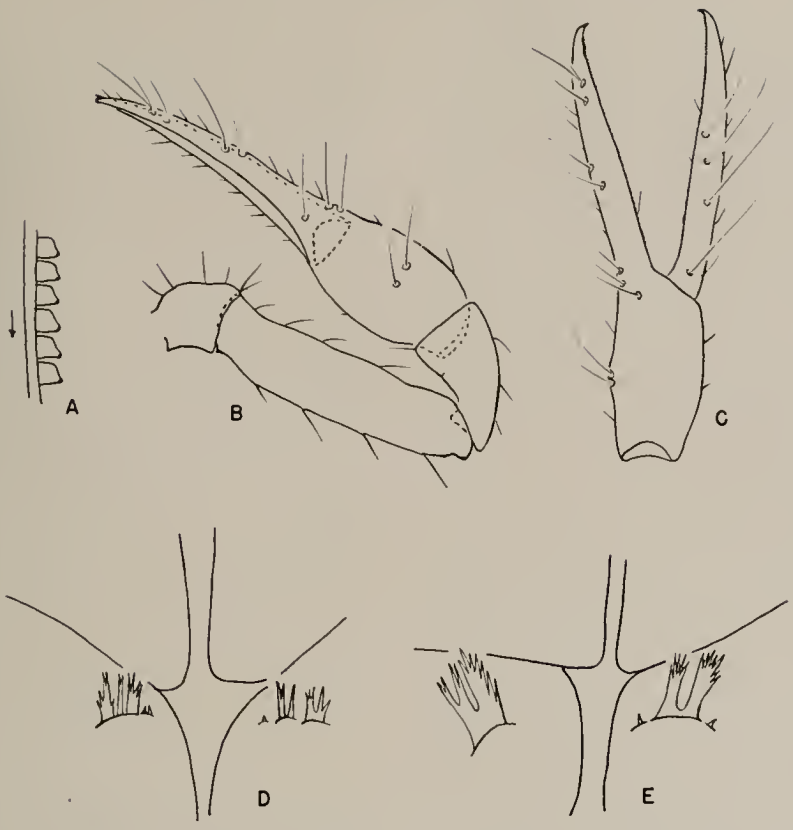


Fig. 17.—*Mundochthonius rossi*. *A*, teeth of distal part of margin of fixed chelal finger, holotype, ♂, arrow points proximad; *B*, dorsal view of palp, paratype, ♂; *C*, lateral view of chela, holotype, ♂; *D*, spines of coxa II, paratype, ♀; *E*, spines of coxa II, allotype, ♀.

chela always less than 4.2 times the width; mesal comb of coxa II fused symmetrically at base to form a fan-shaped structure, fig. 18*D*. . . . . **sandersoni**

Mundochthonius rossi new species

Individuals of this species may be recognized by characteristics given in the key and illustrated in figs. 17*B*, 17*D*.

MALE.—Unless otherwise indicated, observations and measurements are based on four individuals. Body and palps light yellow in color; body and appendages moderately slender; body length 1.05–1.2 mm. Carapace subquadrate; two very weakly developed eyes, each located about its own diameter from the anterior carapacic margin; eyes hardly discernible in caustic-treated individuals. Anterior margin of carapace medially serrate with a small triangular, but variable, epistome; anterior margin of carapace with six setae, of which the farthest lateral one of each side is located a little distance from the actual carapacic margin and close to the eye; posterior margin of carapace with two setae; total setae on carapace 18; carapace smooth except for netlike markings on the sides and sometimes along the posterior margin; carapace narrowed a little toward the anterior end, sides slightly convex; length of carapace 0.38–0.41 mm.; width a little greater than the length, 0.385–0.415 mm.; ocular width 0.38–0.39 mm. Tergites 1 and 2 each with four setae, tergites 3 through 9 each with six setae; tergites almost smooth, undivided. Medial setae of sternites much longer than lateral setae. Pleural membranes with regular rows of fine punctations. Length of abdomen 0.7–0.8 mm., greatest breadth 0.41–0.48 mm.

Chelicera.—A little darker than the carapace; base with six setae, almost smooth. Length of chelicera 0.27–0.29 mm., width

of base 0.155–0.16 mm. Fixed finger basally stout, terminally narrowed and acute; tip of apical tooth brown and sclerotic; inner margin of finger with about 10 conical and acute denticles, usually the distal first and third much larger than the others. Movable finger moderately stout, gently curved, especially near the tip; tip of apical tooth brown and sclerotic; spinneret represented by a rounded and poorly developed knob, apparently without gland ducts; galeal seta near the mid-point of the finger; inner margin of movable finger with about eight denticles, much like those of the other finger in general appearance; serrula exterior with 13 to 15 ligulate plates; length of movable finger about 0.16 mm.

Palp.—Fig. 17*B*. Moderately stout, chela slender; surface of segments smooth. Measurements given as the limits of range secured from four mounted individuals. Trochanter with flexor margin flatly convex in the center and with a few long setae; 1.5–1.7 mm. long, 0.92–0.103 mm. wide; length 1.6 to 1.7 times the width. Femur subcylindrical, extensor margin weakly convex or nearly straight in middle, more convex near the ends; flexor margin slightly convex beyond the mid-point; setae of the flexor surface much longer than those of the extensor surface; 0.345–0.365 mm. long, greatest width just distad from the mid-point and equal to 0.085–0.09 mm., length between 4.0 and 4.15 times the width. Tibia with a few long and slender setae, especially on the extensor surface; outer margin convex, inner margin weakly concave to straight; widest across the extreme distal end; 0.177–0.2 mm. long (usually greater than 0.19 mm.), 0.105–0.11 mm. wide; length between 1.65 and 1.85 times the width. Chela with hand rather stout and fingers slightly curved; both margins of hand evenly convex, but with the flexor margin in most individuals conspicuously more convex than the extensor; chela 0.55–0.585 mm. long, 0.122–0.132 mm. wide, length 4.4 to 4.5 times the width; chelal hand 0.203–0.21 mm. long; depth of hand nearly equal to the width; movable finger 0.36–0.385 mm. long. Viewed from the side, chelal hand, fig. 17*C*, with ventral margin moderately and evenly convex; dorsal margin slightly convex, especially in the region of the tactile setae of the dorsum of the hand; fixed finger nearly straight, movable finger slightly curved. Marginal teeth of chelal fingers subquadrate at the distal end of the row and each tooth with a small cusp on the proximal corner; teeth of the proximal part of each row acuspid and somewhat rounded and flattened; teeth, fig. 17*A*, regularly spaced along virtually the entire finger margin; each finger with usually between 50 and 60 teeth. Tactile setae of chela arranged as indicated in fig. 17*C*.

Legs.—Measurements and observations based on two males; whenever the two show a significant difference, the measurement of the holotype is followed in parentheses by the corresponding measurement of a male paratype. Surfaces of segments smooth; setae not abundant except on the distal segments; each coxa II with three (occasionally two) to five irregular and usually serrate spines, these fused at their bases. First leg with pars basalis subcylindrical, slightly deeper across the distal end than elsewhere, 0.192 (0.201) mm. long, 0.053 mm. deep; pars tibialis with weakly convex extensor margin, more convex flexor margin, 0.11 (0.115) mm. long, 0.05 (0.053) mm. deep; tibia subcylindrical, 0.118 (0.128) mm. long, 0.038 (0.041) mm. deep; tarsus tapering a little toward the distal end, 0.2 (0.217) mm. long, 0.034 mm. deep. Fourth leg with pars basalis very stout, 0.145 mm. deep; pars tibialis 0.133 (0.137) mm. deep; entire femur 0.327 (0.345) mm. long; tibia with the distal one-half of the flexor margin markedly convex, 0.247 (0.258) mm. long, 0.068 (0.071) mm. deep; metatarsus with both margins nearly straight, much less deep at the distal than at the proximal end, 0.1 (0.112) mm. long, 0.05 (0.051) mm. deep; metatarsus with a conspicuous pseudotactile seta on the extensor surface not far from the proximal margin; telotarsus subcylindrical, 0.208 (0.205) mm. long, 0.036 (0.035) mm. deep, a pseudotactile seta placed 0.068 (0.07) mm. from the proximal margin.

Genital Complex.—Posterior operculum with about eight marginal setae; 20 to 25 setae superficially placed on each side of the genital opening; about 10 setae on the anterior operculum.

FEMALE.—Unless otherwise indicated, observations and measurements are based on three individuals; measurements given are the limits of range. Like the male in virtually all respects; body length 1.08–1.2 mm.; carapace 0.4–0.43 mm. long, width equal to length; abdomen 0.4–0.55 mm. wide.

Chelicera.—Like that of the male except

the spinneret is better developed, forming a nodule in which gland ducts appear to terminate; serrula exterior of 14 ligulate plates; length of chelicera 0.27–0.31 mm., width of base 0.16–0.185 mm.; movable finger variable, 0.165–0.195 mm. long.

Palp.—Much as in the male but segments possibly a little larger and femur a little stouter. Trochanter 0.152–0.19 mm. long, 0.093–0.11 mm. wide, length 1.63 to 1.73 times the width; femur 0.34–0.395 mm. (allotype 0.372 mm.) long, 0.091–0.102 mm. wide, length 3.7 to 3.93 (allotype 3.93) times width; tibia 0.183–0.22 mm. long, 0.103–0.129 mm. wide, length 1.7 to 1.8 times width; chela 0.55–0.635 mm. (allotype 0.58 mm.) long, 0.125–0.155 mm. wide, length 4.1 to 4.45 (allotype 4.45) times width; chelal hand 0.205–0.24 mm. (allotype 0.217 mm.) long, depth equal to width; movable finger 0.37–0.41 mm. (allotype 0.38 mm.) long. Viewed laterally the shape of hand and fingers, as well as the dentation and chaetotaxy of fingers, essentially as in the male.

Legs.—As in the male; spines of coxa II extremely variable, figs. 17*D*, 17*E*. Sometimes longer than width of base (as in the allotype). Measurements given are of two individuals, each measurement of the allotype followed in parentheses by the corresponding measurement of the female paratype. First leg: pars basalis 0.205 (0.216) mm. long, 0.055 (0.061) mm. deep; pars tibialis 0.112 (0.129) mm. long, 0.053 (0.061) mm. deep; tibia 0.129 (0.137) mm. long, 0.04 (0.044) mm. deep; tarsus 0.215 (0.23) mm. long, 0.034 (0.036) mm. deep. Fourth leg: pars basalis 0.14 (0.155) mm. deep; pars tibialis 0.13 (0.137) mm. deep; entire femur 0.354 (0.38) mm. long; tibia 0.263 (0.29) mm. long, 0.069 (0.076) mm. deep; metatarsus 0.114 (0.118) mm. long, 0.052 (0.061) mm. deep; telotarsus 0.225 (0.235) mm. long, 0.036 (0.04) mm. deep; tactile seta located 0.076 (0.08) mm. from proximal margin of the telotarsus.

Genital Complex.—Position of mounted specimens prevents description of the chaetotaxy of the genital complex. However, one female examined in alcohol had 8 to 10 setae on the posterior operculum and 10 setae on the anterior operculum. The genital complex is simple and not sclerotized.

TRITONYMPH.—General appearance as in the male but appendages and body smaller, stouter, and lighter in color; carapacic epistome less prominent than in adult; tergal chaetotaxy much as in the adult; body 0.86 mm. long; carapace 0.29 mm. long, greatest width 0.28 mm., ocular and posterior width 0.26 mm.; abdomen 0.56 mm. long, about 0.35 mm. wide.

Chelicera.—Details much as in the adult, but lighter in color, smaller, and stouter; about eight setae in the flagellum; serrula exterior of 12 to 13 plates; length of chelicera 0.21 mm.; length of movable finger 0.133 mm.

Palp.—Measurements of the single available tritonymph as follows: trochanter 0.135 mm. long, 0.084 mm. wide; femur 0.267 mm. long, 0.075 mm. wide; tibia 0.152 mm. long, 0.091 mm. wide; chela 0.43 mm. long, 0.103 mm. wide; chelal hand 0.16 mm. long, 0.103 mm. deep; movable finger 0.29 mm. long. Viewed laterally, fingers somewhat stouter than in male; dorsal margin of hand nearly straight; marginal teeth of same general nature as in male but slightly fewer in number. Movable finger with three setae, difficult to homologize definitely with the setae of the adult; one seta, possibly *t*, located slightly distad from the mid-point of the finger; a second seta, possibly *st*, placed somewhat proximad from the mid-point of the finger and about three areolar diameters from the first seta; *sb* probably wanting; *b* removed from the proximal finger margin by a distance about equal to the width of the finger at the level of the seta. Fixed finger with tactile setae much as in the adult except only one seta on the dorsum of the hand.

Legs.—Segments essentially as in the adult except much smaller and stouter; each coxa II with four or five apparently simple spines, unequal in length. First leg: pars basalis about 0.15 mm. long, 0.049 mm. deep; pars tibialis 0.085 mm. long, 0.045 mm. deep; tibia 0.095 mm. long, 0.037 mm. deep; telotarsus 0.148 mm. long, 0.03 mm. deep. Fourth leg: pars basalis 0.11 mm. deep; pars tibialis 0.102 mm. deep; entire femur 0.258 mm. long; tibia 0.193 mm. long, 0.06 mm. deep; metatarsus 0.08 mm. long, 0.045 mm. deep; telotarsus 0.159 mm. long, 0.038 mm. deep; seta 0.045 mm. from proximal margin of telotarsus.

DEUTONYMPH.—Observations based on one mounted individual. Body and appendages smaller and stouter than in the tritonymph; body not treated with caustic, and chaetotaxy of carapace and tergites not ob-

served; body 0.75 mm. long; carapace nearly 0.24 mm. long, about 0.29 mm. wide, posterior width 0.28 mm., ocular width 0.24 mm.; two weakly developed eyes; abdomen about 0.52 mm. long, 0.3 mm. wide.

Chelicera.—Much like that of the tritonymph; flagellum with about six setae; slightly fewer marginal teeth on fingers and apparently fewer setae on the base; serrula exterior with 10 plates; movable finger 0.102 mm. long.

Palp.—Segments fairly stout; trochanter with the flexor margin irregularly convex, 0.103 mm. long, 0.068 mm. wide; femur distinctly subcylindrical in outline, 0.19 mm. long, 0.059 mm. wide; tibia with extensor margin convex, flexor margin weakly concave, 0.12 mm. long, 0.075 mm. wide; chela 0.325 mm. long, 0.083 mm. wide; chelal hand 0.12 mm. long, 0.08 mm. deep; movable chelal finger 0.215 mm. long. Viewed laterally, fingers appear fairly stout, both a little curved; 30 to 35 teeth on each finger, the teeth of the basal one-third of each finger distinctly rudimentary. Movable finger with two tactile setae, one (possibly *st*) located just within the basal one-third of the finger and the other (possibly *t*) located a little distance proximad from the mid-point of the finger. Fixed finger with setae somewhat as in the tritonymph except *it* and *est* relatively more basal in position, and only two setae (probably *esb* or *eb* wanting) in the group near the base of the finger.

Legs.—Segments much smaller and stouter than in the tritonymph; spines of each coxa II variable, both simple and deeply incised spines present. First leg (measurements subject to possible error as the leg was not dissected from the specimen): pars basalis 0.1 mm. long, 0.036 mm. deep; pars tibialis 0.065 mm. long, 0.036 mm. deep; tibia 0.068 mm. long, 0.034 mm. deep; tarsus about 0.12 mm. long, 0.029 mm. deep. Fourth leg not in a position favorable for measuring.

Holotype, male.—Starved Rock State Park, Illinois: May 6, 1944, M. W. Sanderson.

Allotype, female.—Starved Rock State Park, Illinois: Nov. 8, 1943, mossy debris on shelves. Ross and Sanderson.

Paratypes.—ILLINOIS.—STARVED ROCK STATE PARK: Same data as for holotype, 5♂, 1♀, 1 tritonymph; same data as for allotype, 2♂, 1♀. WHITE PINES FOREST STATE PARK: July 14, 1944, Frison & Sanderson, 2♀, 1 deutonymph, 2 tritonymphs.

The following are additional Illinois records not included in the paratype series: AMBOY: Dec. 6, 1945, Ross & Sanderson, 1 specimen. MOUNT CARROLL: Smith Park, Dec. 6, 1945, 8 specimens. WHITE PINES FOREST STATE PARK: soil cover in oak-hickory grove, Oct. 8, 1933, J. Alsterlund, 1 specimen.

This species occurred in eight collections from the northern one-fourth of the state, all taken from ground cover and debris, especially around sandstone outcroppings. Many of the collections were from Starved Rock State Park and White Pines Forest State Park, where conditions are favorable for the preservation of the original fauna.

Mundochthonius sandersoni new species

This species can be identified by characteristics given in the preceding key and illustrated in fig. 18.

MALE.—Measurements and ratios represent the limits of range of four individuals. Small, fragile, light yellow in color; body and appendages moderately stout; body length 0.75–0.9 mm. Carapace nearly square in dorsal outline; surface virtually smooth except marked on the sides by netlike lines; posterior margin straight, lateral margins usually a little convex; subtriangular epistome with a conspicuously serrate margin; four setae along the posterior carapacic margin; total setae on the carapace probably 20 (difficult to determine in specimens examined); eyes vestigial, often entirely wanting; length of carapace including the epistome 0.28–0.31 mm., greatest width about equal to the length, posterior width slightly less than the greatest width and ranging from 0.27 to 0.31 mm. Abdomen weakly ovate; tergites and sternites not divided; tergites 1, 2, and 3 each with four acuminate setae, more posterior tergites each with six setae; sternites 5 through 11 with 8 to 10 acuminate setae; setae of sternite 4 not determined in the male; length of abdomen 0.5–0.6 mm., width 0.3–0.37 mm. Pleural membranes finely and weakly papillose.

Chelicera.—Large in ratio to the rest of the animal; slightly darker in color than the body and legs; 0.19–0.215 mm. long, width of base 0.115–0.13 mm.; base with six acuminate setae; lateral surfaces of base spinose, spines very short and readily seen only in relief; flagellum of about nine slender plumose setae. Fixed finger curved, apical

Fig. 18.—*Mundochthonius sandersoni*. *A*, movable cheliceral finger, serrula omitted, paratype, ♀ ; *B*, fourth leg, paratype, ♀ ; *C*, lateral view of chela, holotype, ♂ ; *D*, coxal spines, paratype, ♂ ; *E*, dorsal view of palp, paratype, ♂ ; *F*, epistome, paratype, ♀ ; *G*, epistome, paratype, ♀, another variation.

tooth sclerotized and strong; nearly 12 acute teeth along the internal finger margin, the distal tooth very heavy, teeth toward base weaker; serrula interior reduced. Movable finger 0.1–0.13 mm. long; galeal seta long, inserted near the mid-point of the finger; apical tooth strong and sclerotic; galea represented by a prominent knob, which appears to be the terminus for a few gland ducts; usually between 8 and 10 acute, conical teeth along the distal one-half or two-thirds of the finger margin, with the most distal tooth larger than the others and located some distance from the next more proximal tooth; serrula exterior of 14 to 15 ligulate plates.

Palp.—Fig. 18*E*. Light yellow in color with chela very slightly darker than the rest of the palp; moderately stout; segments with a few acuminate setae; segments smooth except the dorsum of the chelal hand. Trochanter with irregular flexor margin, usually flatly convex in the central portion; 0.114–0.123 mm. long, 0.064–0.072 mm. wide, length 1.7 to 1.8 times the width. Femur subcylindrical; inner margin slightly concave, outer margin nearly straight in the central portion but convex at each end, widest in the distal half; 0.22–0.25 mm. long, 0.064–0.072 mm. wide, length 3.45 to 3.65 times the width. Tibia subtriangular, widest across the extreme distal end; inner margin weakly concave, outer margin convex, usually a little flatly convex; 0.125–0.15 mm. long, 0.077–0.084 mm. wide, length between 1.63 and 1.73 times the width. Chela with hand moderately stout; fingers slender, strongly but evenly curved in dorsal view; hand with outer margin flatly convex, inner margin more convex; 0.37–0.42 mm. long, 0.091–0.102 mm. wide, length 4.0 to 4.15 times width; hand 0.136–0.152 mm. long, 0.09–0.1 mm. deep; movable finger 0.25–0.285 mm. long, usually 0.27

mm. or more. Viewed laterally, dorsal and ventral margins of the hand weakly convex, fig. 18*C*, with the arc of the dorsal margin broken by the insertion of the two tactile setae, *ib* and *isb*, on the dorsum of the hand; fixed finger in lateral view with straight inner margin, outer margin weakly convex, finger tapering rapidly in the distal one-fourth; movable finger more slender than the fixed finger. Both fingers usually with from 45 to 55 marginal teeth, varying in structure from the distal ones, which are subquadrate and each with a cusp on the proximal corner, to the proximal ones, which are rounded and acuspid; teeth spaced along most of the finger margin. Tactile setae as in fig. 18*C*.

Legs.—Moderately stout, light yellow in color; scattered acuminate setae, numerous only on the distal segments. A flat, semilunar blade on each coxa II, fig. 18*D*; the blade irregularly and deeply incised along the margin and showing considerable interspecific variation; blade wider than long; two or three minute short spines often located medially from the blade. First leg with trochanter 0.064–0.075 mm. long, length 1.23 to 1.33 times the depth; pars basalis subcylindrical, deepest near the distal end, 0.118–0.133 mm. long, 0.04–0.045 mm. deep, length 2.9 to 3.05 times the depth; pars tibialis stout, 0.065–0.073 mm. long, length between 1.62 and 1.73 times the depth; tibia with extensor margin nearly straight, flexor margin weakly convex, 0.076–0.087 mm. long, 0.03–0.034 mm. deep, length 2.5 to 2.56 times the depth; tarsus tapering slightly toward distal end, 0.129–0.145 mm. long, 0.025–0.027 mm. deep, length between 4.9 and 5.4 times the depth. Fourth leg with femur stout; chaetotaxy and color much as in the first leg; pars basalis 0.097–0.105 mm. deep; pars tibialis 0.09–0.098 mm. deep; entire femur 0.215–0.24 mm. long, length 2.22 to 2.35 times the depth; tibia with the basal one-third of the extensor margin slightly convex, distal two-thirds of the extensor margin almost straight, flexor margin weakly S-shaped, greatest depth in the distal one-third; 0.158–0.175 mm. long, 0.05–0.055 mm. deep, length 3.15 to 3.3 times the depth; metatarsus stout, a sensory seta near the basal one-fourth of the extensor margin, 0.061–0.072 mm. long, 0.037–0.041 mm. deep, length 1.6 to 1.95 times the depth; telotarsus subcylindrical, margins nearly straight, setae of flexor surface very numerous, 0.122–0.136 mm. long, 0.027–0.3 mm. deep, length 4.47 to 4.54 times the depth; seta of extensor surface of telotarsus removed by 0.03–0.035 mm. from the proximal margin of the segment.

Genital Complex.—Anterior operculum with 10 to 12 scattered setae; posterior operculum with 12 to 16 marginal setae; 8 to 10 setae on the lateral rim of each side of the aperture; setae small and obscure.

FEMALE.—Unless otherwise indicated, measurements are based on seven individuals. Essentially like the male in all details but much larger in actual size of body and appendages, appendages frequently a little stouter. Body length 0.9–1.15 mm.; carapace 0.31–0.33 mm. long, 0.29–0.35 mm. wide; abdomen usually 0.6–0.8 mm. long and 0.3–0.45 mm. wide.

Chelicera.—As in the male; length 0.22–0.245 mm., width of base 0.13–0.15 mm.; movable finger, fig. 18*A*, between 0.135 and 0.15 mm. long; serrula exterior with 14 ligulate plates.

Palp.—As in the male. Maxilla usually 0.2–0.22 mm. long, about one-half as wide as long; trochanter 0.125–0.135 mm. long, 0.068–0.076 mm. wide, length 1.73 to 1.85 times the width; femur 0.25–0.27 mm. long, 0.072–0.08 mm. wide, length 3.4 to 3.5 times the width; tibia 0.15–0.156 mm. long, 0.09–0.093 mm. wide, length 1.67 to 1.71 times the width; chela 0.42–0.44 mm. long, 0.11–0.18 mm. wide, length 3.68 to 3.89 times the width; chelal hand 0.158–0.168 mm. long, 0.11–0.118 mm. deep, the depth equal to the width; movable finger 0.275–0.295 mm. long.

Legs.—As in the male. Measurements based on four individuals. First leg with trochanter 0.074–0.079 mm. long, length 1.18 to 1.27 times the depth; pars basalis 0.133–0.145 mm. long, 2.95 to 3.05 times the depth; pars tibialis 0.076–0.078 mm. long, length 1.68 to 1.81 times the depth; tibia 0.087–0.095 mm. long, 2.5 to 2.7 times the depth; tarsus 0.132–0.145 mm. long, length 4.35 to 5.4 times the depth, usually under 4.6 times the depth. Fourth leg, fig. 18*B*, with pars basalis 0.1–0.11 mm. deep; pars tibialis 0.09–0.1 mm. deep; entire femur 0.24–0.25 mm. long, length 2.15 to 2.3 times the depth; tibia 0.17–0.18 mm. long, length 3.1 to 3.25 times the depth; metatarsus 0.072–0.076 mm. long, 1.65 to 1.75 times the depth; telotarsus 0.13–0.14 mm. long, length 4.25 to 4.4 times the depth.

Genital Complex.—Posterior genital operculum with seven or eight acuminate setae; anterior operculum with four setae on each side anteriad and laterad to the genital aperture and two additional setae just anteriad to the pore.

Holotype, male.—Herod, Illinois: April 18, 1944, Ross & Sanderson.

Allotype, female.—Same data as for holotype.

Paratypes.—Illinois.—Same data as for holotype, 8♂, 59♀. HEROD: ground cover

Fig. 19.—*Microbisium confusum* ♀. An example of the suborder Diplosphyronida and the family Neobisiidae.

in woods, Oct. 12, 1933, Frison & Ross, 1♂, 3♀. FOUNTAIN BLUFF: March 18, 1942, Ross & Sanderson, 1♀. LAKE GLENDALE: ground cover, March 17, 1943, Ross & Sanderson, 1♂, 4♀; 1♂, 1♀ (CH). LA RUE: ground cover, April 19, 1944, Ross & Sanderson, 2♀ (NHS). THEBES: ground cover, April 19, 1944, Ross & Sanderson, 5♀.

There are two records in addition to the type series. DIXON SPRINGS: March 7, 1945, Ross & Sanderson, 1 specimen. VIENNA: debris in woods, Jan. 25, 1947, B. D. Burks, 5 specimens.

This species is dedicated to Dr. Milton W. Sanderson of the Illinois Natural History Survey staff.

UNPLACED SPECIES

6. *Genus? packardi* Hagen

Blothrus packardi Hagen (1879, p. 399).
Chthonius packardi Banks (1895, p. 13).

This species was described from material collected from caves in Kentucky and Indiana. Hagen's description, although insufficient to permit an accurate generic placement, indicates characters that provide means for the separation of this unplaced species from other northeastern species of Chthoniini, as given in the key. The types of this species appear to have been lost, being neither in the U. S. National Museum nor among the types of Hagen's other species at the Museum of Comparative Zoology, and I have seen no material of the species. Since caves occur in Illinois, it is possible that this form may be found in the state.

Suborder DIPLOSPHYRONIDA

In North America, and with rare exception elsewhere, members of this suborder may be recognized by the presence of the divided tarsus of each leg.

KEY TO SUPERFAMILIES

Movable finger of chelicera toothed along at least one-fifth of inner margin, fig. 25*C*. . . . . **Neobisioidea**, p. 443

Movable finger of chelicera with either a single tooth or with a small group of teeth at apex of inner margin, fig. 27*D*. . . . . **Garypoidea**, p. 446

Superfamily NEOBISIOIDEA

Species belonging to this superfamily have the movable finger of the chelicera toothed on the inner margin; the plates of the serrula interior are not fused; and the subterminal setae of the pedal telotarsus are seldom simple. A single family, Neobisiidae, is present in our immediate fauna but two other families, Syarinidae and Ideoroncidae, have a very limited number of genera and species in the Rocky Mountain region and in California.

KEY TO FAMILIES

1. Venom apparatus developed in both fixed and movable chelal fingers . . . . . **Ideoroncidae**

   Venom apparatus developed only in the fixed finger, fig. 24. 2

2. Pleural membrane of abdomen smoothly and longitudinally plicate, never granulate; suture between pars basalis and pars tibialis of femur IV at least slightly oblique to the long axis of the femur. . . . . **Syarinidae**

   Pleural membrane of abdomen granulate or granulo-striate; suture between parts

of femur IV truly perpendicular to the long axis of the femur.....**Neobisiidae**

IDEORONCIDAE

The genus *Albiorix* Chamberlin is reported from the southwestern part of the United States. A key to the species of the genus is given by Hoff (1945*e*).

SYARINIDAE

This family is represented in the American fauna north of Mexico by one genus, *Syarinus* Chamberlin, with a limited number of species in the Rocky Mountain and Pacific Coast areas and by two very restricted genera, *Hyarinus* Chamberlin and *Chitra* Chamberlin, in California.

NEOBISIIDAE

Members of this family are identified by the presence of a venom apparatus only in the fixed finger, by the granulate nature of the pleural membranes, and by the vertical suture between the pars basalis and pars tibialis of the third and fourth legs. One subfamily is represented in Illinois, and a second is known from Arkansas.

KEY TO SUBFAMILIES

Cheliceral galea present, at least almost as long as the apical tooth and having one or more branched processes, fig. 23.....**Ideobisiinae**

Cheliceral galea wanting or represented by no more than a sclerotic knob, fig. 25*C*.....**Neobisiinae**

Subfamily IDEOBISIINAE

While this subfamily has not been reported from Illinois, it is possible that, with further collecting, members of the genus *Microcreagris* may be found in the state.

7. *MICROCREAGRIS* Balzan

Microcreagris Balzan (1891, p. 543). Genotype, monobasic: *Microcreagris gigas* Balzan.

This genus, figs. 22, 23, may be separated from the other genera of the subfamily by the way in which the tactile setae *t, st,* and *sb* are scattered on the movable chelal finger rather than clustered submedially. There is a single simple or branched galea.

This genus is not reported from Illinois, but *ozarkensis* Hoff (1945*a*) has been described from Arkansas, and it is expected that this or related species of *Microcreagris* may eventually be found in Illinois.

Subfamily NEOBISIINAE

This subfamily forms a coherent group of forms in which the galea is either wanting or greatly reduced and represented by no more than a sclerotic knob. A single genus is recorded from Illinois. A second genus, *Neobisium* Chamberlin, is included here since it has been reported from Tennessee.

KEY TO GENERA

Four long tactile setae present on movable chelal finger and eight on fixed chelal finger, fig. 20.....**8. Neobisium**

Three long tactile setae present on movable, and seven on fixed, chelal finger, fig. 25*B*.....**9. Microbisium**

8. NEOBISIUM Chamberlin

Neobisium Chamberlin (1930, p. 11). Genotype, by original designation: *Obisium mus corum* Leach.

The genus, figs. 20, 21, can be recognized by the character given in the key, by the presence of tactile setae *et, est,* and *it* on the distal third rather than the distal fourth or fifth of the fixed chelal finger, and by the no more than moderately slender legs and palp.

To date this genus has not been reported from Illinois but is represented by several species occurring in the southeastern states. One of these, *tenuis* Chamberlin, has been taken in Tennessee and there is a possibility that it or one of its congeners may ultimately be found in Illinois.

Chamberlin (1930) described *tenuis* as a variety of *carolinensis* (Banks 1895). On the basis of differences pointed out by Chamberlin in the original description of *tenuis,* it seems probable that this form should have specific rather than varietal status. The typical form of *carolinensis* is found in Georgia and North Carolina, while *tenuis* is confined to the mountain area of eastern Tennessee. Because of its habitat, *tenuis* is hardly to be expected in our fauna.

9. *MICROBISIUM* Chamberlin

Microbisium Chamberlin (1930, pp. 10, 20). Genotype, by original designation: *Obisium brunneum* Hagen.

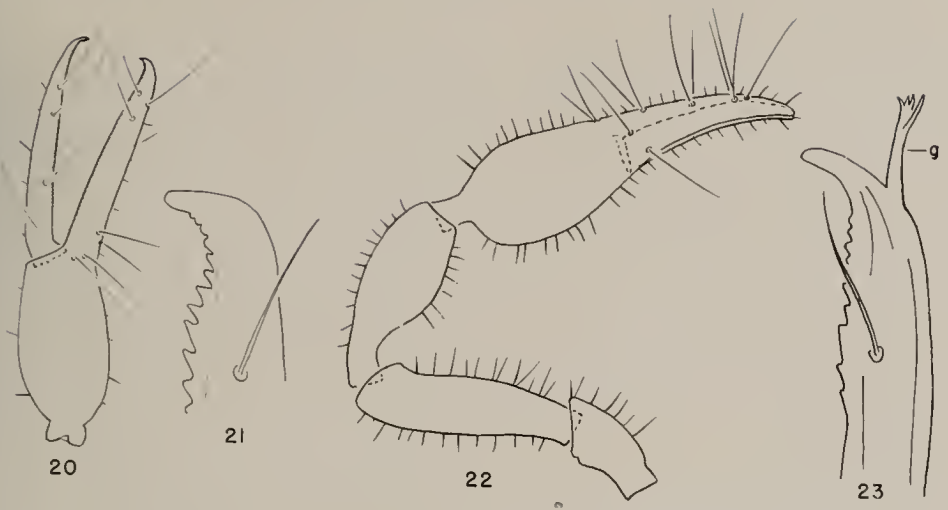


Fig. 20.—*Neobisium carolinensis tenuis* ♂. Lateral view of chela.
Fig. 21.—*Neobisium carolinensis tenuis* ♂. Distal part of movable cheliceral finger.
Fig. 22.—*Microcreagris ozarkensis* ♂. Dorsal view of palp.
Fig. 23.—*Microcreagris ozarkensis* ♂. Distal half of movable cheliceral finger; *g*, galea.

Members of this genus are peculiar in that the number of tactile setae of the chelal fingers is reduced to three setae on the movable finger and seven setae on the fixed finger, fig. 25*B*. Males have not been found in this genus.

Three species are placed in the genus, two eastern ones treated below, and a third, *parvulum* (Banks), from the southwestern states. These are treated by Hoff (1946*c*).

KEY TO SPECIES

Palpal femur less than 0.4 mm. long, length between 2.42 and 2.89 times the width .... **confusum**
Palpal femur more than 0.4 mm. long, length between 2.87 and 3.2 times the width ..... **brunneum**

Microbisium brunneum (Hagen)

Obisium brunneum Hagen (1869, p. 52).
Microbisium brunneum (Hagen). Chamberlin (1930, p. 20), Hoff 1946*c*, p. 494.
Microbisium brunneum (Hagen), in part. Hoff (1944*a*, p. 125; 1946*b*, p. 109).

This species is readily identified by characters indicated in the key. An extensive redescription of the species is given by Hoff (1946*c*).

DISTRIBUTION.—*Microbisium brunneum* has a wide geographic range in eastern Canada and in northern United States from New York to Illinois. In Illinois its distribution is markedly discontinuous. It has been taken in 14 collections from Lake County in the northeastern corner of the state and in 1 collection each from Alexander and Pulaski counties, both in the extreme southern tip of the state. All collections of this species from Lake County were made from tamarack bogs. Of the collections from the southern tip of the state, one was taken from "dry forest" in the Horseshoe Lake Game Refuge near Olive Branch and the other was from "humus and soil from drier part of bank, cypress bottoms" near Karnak. The distribution seems to indicate that *brunneum* is associated with acid soil and water and with deciduous coniferous trees in Illinois associated with either tamarack or cypress.

Illinois Records.—About 200 adults and nymphs of all sizes from several localities. ANTIOCH: sphagnum moss in tamarack bog, Oct. 15, 1942, and Oct. 27, 1943, Ross & Sanderson. KARNAK: humus and soil from drier part of bank, cypress bottoms, Feb. 24, 1933, Ross & Mohr. OLIVE BRANCH: Horseshoe Lake Game Refuge, dry forest, Dec. 2, 1943, Frison & Ayars. VOLO: sphagnum moss in tamarack bog, Oct. 7, 1933, J. Alsterlund; sphagnum moss in tamarack bog, Oct. 27, 1943, Ross & Sanderson. WAUCONDA: ground cover in tamarack bog, March 16, 1933, Frison & Mohr; tamarack bog, ground cover, Oct. 20, 1943, Ross & Sanderson.

Microbisium confusum Hoff

Microbisium brunneum Hoff (*non* Hagen), in part (1944*a*, p. 125; 1946*b*, p. 109). Misidentification.

Microbisium confusum Hoff (1946*c*, p. 496).

Identification of this species can be made by the characteristics given in the key and illustrated in figs. 19, 25*A*, 25*B*. In addition to the scheme indicated in the key, the following will help in separating *brunneum* and *confusum*. *M. confusum* shows the following average differences when compared with *brunneum*: the body is smaller; the palp is smaller, less sclerotized, less deeply colored, and less polished; the palpal femur is conspicuously smaller and stouter; the pedicle of the tibia is commonly less slender and the inner margin of the palpal tibia is usually more evenly rounded or convex; and the chelal fingers appear stouter when viewed from the dorsum. Additional descriptive material is contained in the original description (Hoff 1946*e*).

DISTRIBUTION.—*Microbisium confusum* appears to be the common species of the genus in the Mississippi River valley and the eastern United States. In Illinois it is the most widely distributed and most abundant species of all the pseudoscorpions and has been taken in 148 collections from all parts of the state. It occurs in forest soil and litter, and in decayed logs or stumps. The species is found associated with *brunneum* in the tamarack bogs of northeastern Illinois.

Illinois Records.—Many adults and nymphs taken during all months of the year are from Adams County, Alhambra, Alto Pass, Antioch, Apple River Canyon State Park, Astoria, Aurora, Bensenville, Brownfield Woods, Browning, Burksville, Burton, Cadiz, Caledonia, Charleston, Clarksville, Collinsville, Cook County, Danville, Dixon Springs, Dolson, Elgin, Enfield, Fountain Bluff, Fox Ridge State Park, Freeport, Galena, Geff, Giant City State Park, Grafton, Halfday, Havana, Herod, Highland Lake (near Grays Lake), Ivanhoe, Kampsville, Kell, Kellerville, La Grange, Lake Glendale, Lake Zurich, La Rue, Lincoln, Logan, Magnolia, Makanda, Marshall, Mascoutah, Mason County, Monticello, Mound City, New Windsor, Oakwood, Palestine, Palisades State Park, Paloma, Palos Park, Peoria, Pocahontas, Quincy, Ruma, Seymour, Sherman, Siloam, (Siloam Springs), Starved Rock State Park, Summit, Troy, Urbana, Ursa, Vienna, Volo, Wauconda, Waukegan, White Pines Forest State Park, Winthrop Harbor, Zion.

Superfamily GARYPOIDEA

Members of this superfamily are characterized as follows: the movable cheliceral finger, instead of being toothed on the inner margin, bears a simple, or occasionally a subdivided, subterminal lobe; the plates of the serrula interior are fused basally to form a velum and only the terminal teeth are free; the subterminal setae of the telotarsi are always simple and acute. Three families are represented in the United States but only one, the Garypidae, has representatives in the north-central part of the country.

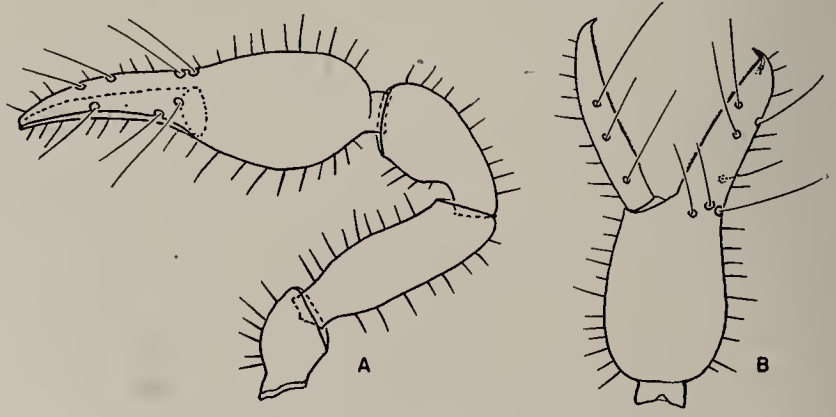


Fig. 24.—*Microbisium brunneum* ♀. *A*, dorsal view of palp; *B*, lateral view of chela, poison gland (in fixed finger only) shown by dotted line.

KEY TO FAMILIES

1. Venom apparatus developed in fixed finger only; at base of reduced or vestigial apical tooth of the movable finger is a groove, the receptor venedentis, into which fits the tooth or venedens of the fixed finger.....**Menthidae**
   Venom apparatus developed in both fixed and movable fingers; movable finger without receptor venedentis.....2
2. Pleural membrane smoothly and evenly plicate; carapace usually not triangular; coxal area never widened posteriorly; setae of palpal femur and tibia conspicuous, always slender and acute ... .**Olpiidae**
   Pleural membrane not smoothly and evenly plicate; carapace definitely triangular in shape, fig. 27*C*; coxal area with few exceptions much widened posteriorly; setae of the palpal femur and tibia short and inconspicuous; if acute, these setae are very short.....**Garypidae**

MENTHIDAE

This family is represented in America north of Mexico by a single genus, *Menthus* Chamberlin, a few species of which occur in California.

OLPIIDAE

The family contains a few genera and species confined in the United States chiefly to the arid and semiarid regions of the Southwest.

GARYPIDAE

This family is characterized by a venom apparatus in each of the chelal fingers; investing setae of palpal femur and tibia short and inconspicuous; pleural membranes granular or with rugose striations, not evenly striated; carapace subtriangular; abdomen broader than the cephalothorax. A single genus occurs in central and eastern United States. The only other nearctic genus, *Garypus*, is represented by a few species in California and doubtful records from Florida.

10. *LARCA* Chamberlin

Larca Chamberlin (1930, p. 609). Genotype, by original designation: *Garypus latus* Hansen.

This genus, fig. 26, contains species in which the arolia are longer than the terminal claws of the pedal tarsi; the movable chelal finger has two tactile setae; pars basalis of legs I and II is never much longer than the pars tibialis; the femoral articulation of the first two pairs of legs is only slightly mobile; the investing setae of the palps are decidedly lanceolate. Only the following species of this genus is known to occur in North America.

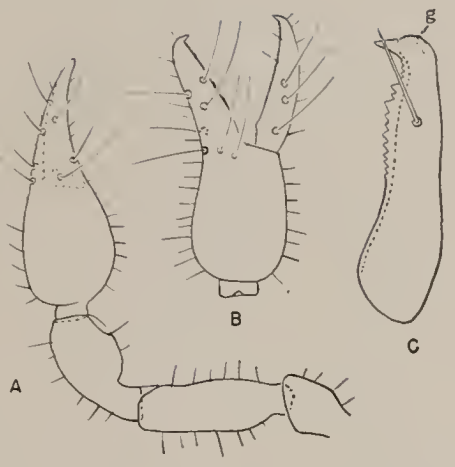


Fig. 25.—*Microbisium confusum* ♀. *A*, dorsal view of palp; *B*, lateral view of chela; *C*, chelicera, movable finger; *g*, knoblike galea, showing silk ducts. *A* and *B* same scale as fig. 24.

Larca granulata (Banks)

Garypus granulatus Banks (1891, p. 163).

Fig. 26.—*Larca granulata*. An example of the suborder Diplosphyronida and the family Garypidae. The division of the tarsus into metatarsus and telotarsus is so obscure and weak that it is not discernible in the figure.

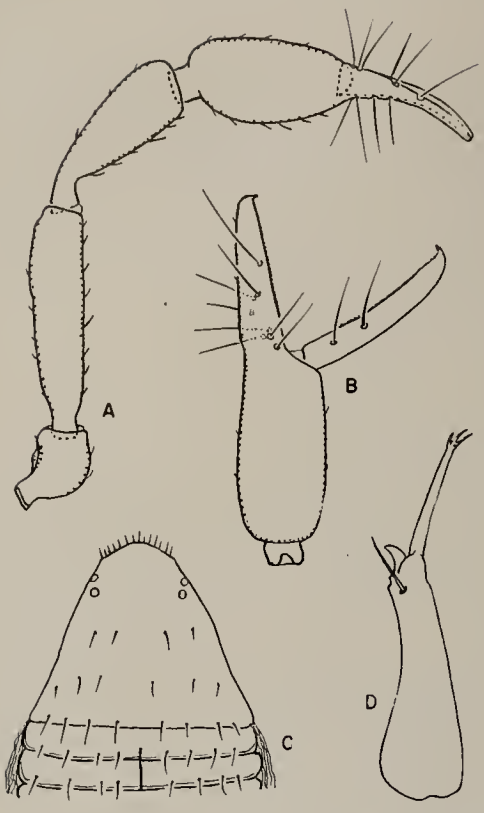


Fig. 27.—*Larca granulata* ♀. *A*, dorsal view of palp; *B*, lateral view of chela; *C*, dorsal view of carapace; *D*, chelicera, movable finger.

Larca granulata (Banks). Chamberlin (1930, p. 616), Hoff (1946*b*, p. 109).

Chernes dentatus Ross (*non* Banks), (1944, fig. 56). Misidentification.

Individuals of this species are easily recognized by the family characteristics, since this is the only garypid pseudoscorpion in the state. For sight recognition, the following characters are useful: the stout abdomen in which the width is nearly equal to the length, the triangular carapace, and the slender form of the palpal segments, fig. 27*A*.

The following measurements are given for a more detailed check of identifications. They were taken from a female mounted in Canada balsam: body length 2.1 mm.; carapace 0.6 mm. long, 0.8 mm. wide across the posterior margin; abdomen 1.5 mm. long, 1.3 mm. wide; palpal trochanter 0.3 mm. long, 0.17 mm. wide; femur 0.66 mm. long, 0.163 mm. wide; tibia 0.57 mm. long, 0.185 mm. wide; chela exclusive of pedicle 0.85 mm. long, 0.247 mm. wide; depth of chelal hand 0.215 mm., length 0.44 mm.; movable chelal finger 0.44 mm. long. First leg with pars basalis 0.235 mm. long, 0.09 mm. deep; pars tibialis 0.175 mm. long, 0.103 mm. deep; tibia 0.215 mm. long, 0.075 mm. deep; metatarsus 0.15 mm. long, 0.055 mm. deep; telotarsus 0.14 mm. long, 0.045 mm. deep. Fourth leg with entire femur 0.49 mm. long, 0.133 mm. deep; tibia 0.37 mm. long, 0.088 mm. deep; metatarsus 0.18 mm. long, 0.065 mm. deep; telotarsus 0.175 mm. long, 0.05 mm. deep.

In the Illinois collections are several nymphs of two sizes. Since the determination of which nymphal stages are represented is questionable, it is desirable to wait for descriptions until all three nymphal stages are available for study.

DISTRIBUTION.—This species occurs in the central and northeastern United States. No collections have been taken in Illinois in addition to those previously recorded (Hoff 1946*b*) from Starved Rock State Park (La Salle County) and Fountain Bluff (Jackson County).

The species is found chiefly in debris and moss on sandstone ledges.

Illinois Records.—FOUNTAIN BLUFF: March 18, 1942, Ross & Sanderson, 3 adults. STARVED ROCK STATE PARK: mossy debris on shelves, sandstone bluff, Nov. 8, 1943, Ross & Sanderson, 5 adults, 4 nymphs.

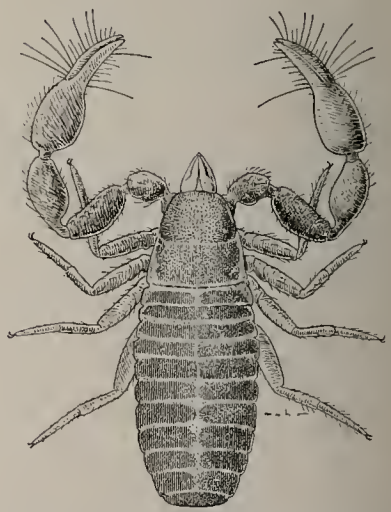


Fig. 28.—*Pselaphochernes parvus*. An example of the suborder Monosphyronida and the family Chernetidae.

Suborder MONOSPHYRONIDA

Pseudoscorpions of this suborder have only a single tarsal segment on each leg. Three superfamilies are recorded from America north of Mexico, only one of which is represented in the north-central part of the United States.

KEY TO SUPERFAMILIES

1. With four prominent eyes... **Feaelloidea**
   With two eyes or none, never with four 2
2. Femora of legs I and II similar to those of legs III and IV, with the same type of articulation.....**Cheiridioidea**
   Femora of legs I and II each with a more or less distinct membranous articulation between pars basalis and pars tibialis, the apex of the pars basalis often enlarged, and the less deep base of the pars tibialis frequently appears to fit into it, fig. 44*A*; femora of legs III and IV with pars basalis and tibialis more or less fused solidly, about the same length where they join, the fusion being a somewhat straight suture, fig. 44*B*... .....**Cheliferoidea**

Superfamily FEAELLOIDEA

The nearctic fauna of this superfamily contains only the family Pseudogarypidae, represented in North America by a single genus, *Pseudogarypus* Ellingsen. This genus has only a few species and is restricted to the Rocky Mountain and the Pacific Coast areas.

Superfamily CHEIRIDIOIDEA

Two families are represented in the fauna of America north of Mexico, but neither is found in Illinois.

KEY TO FAMILIES

Venom apparatus developed only in fixed chelal finger; femoral articulations of legs lacking or vestigial so that the pars tibialis and the pars basalis appear to be fused into one.... .....**Cheiridiidae**
Venom apparatus developed in both chelal fingers; femoral articulations of legs well developed.... ...**Sternophoridae**

CHEIRIDIIDAE

This family is represented in America north of Mexico by a few species of the genus *Apocheiridium* Chamberlin, found only on the west coast of the United States.

STERNOPHORIDAE

Representatives of this family are found in western Mexico, southern United States, and Australia (Chamberlin 1931*a*). Two genera, one of which is of uncertain status, have been placed in the family. A limited number of species of the genus *Sternophorus* Chamberlin are known from southern and southwestern United States and one species of the genus *Garyops* Banks has been reported from Florida. The genus *Garyops* is inadequately described and *Sternophorus* may eventually prove to be a synonym.

Superfamily CHELIFEROIDEA

Members of this superfamily always have the femora of the first and fourth legs structurally dissimilar; eyes two or none. The group is represented in America north of Mexico by three families, two of which have representatives in our area.

KEY TO FAMILIES

1. At least a few accessory teeth present on chelal fingers, figs. 32*D*, 34*B*, 36*A*; venom apparatus well developed in movable finger only, but may be present as a vestige in the fixed finger..... .....**Chernetidae**, p. 449
   No accessory teeth present on chelal fingers, figs. 49*C*, 50*C*, 51*C*; venom apparatus not as above.....2
2. Venom apparatus developed in fixed finger only; terminal venom tooth of fixed finger structurally much more prominent than terminal tooth of movable finger.....**Atemnidae**, p. 485
   Venom apparatus developed equally well in both fixed and movable fingers, fig. 51*C*; terminal teeth of both fingers equal in size, or nearly so..... .....**Cheliferidae**, p. 485

CHERNETIDAE

Both nearctic subfamilies of this family are known from Illinois. In use of the following key for their separation, great care must be exercised because the tactile seta of the fourth pedal tarsus is often broken or lost.

KEY TO SUBFAMILIES

Setae of body and palps long and acuminate; when present, the tactile seta of the fourth pedal tarsus is located considerably proximad

from the mid-point of the segment.....
.....**Lamprochernetinae**

At least some of the setae of body and palps denticulate, well feathered, or plumose, often appearing club shaped, figs. 36*A*, 37*D*, 46; when present, the tactile seta of the fourth pedal tarsus is located near the middle or distad from the middle of the segment.....
.....**Chernetinae**

Subfamily LAMPROCHERNETINAE

This subfamily is characterized by a straight or slightly convex posterior carapacic margin; the setae on the body and palps are long and acuminate; and, when present, the tactile seta of the tarsus of the fourth leg is inserted near the base of the tarsus. Only two genera are recorded from America north of Mexico. One genus, *Lamprochernes* Tömösváry, is found in the eastern and central parts of the United States. From California and Florida is reported the other genus, *Lustrochernes* Beier, which contains chiefly species that are of uncertain position because of inadequate descriptions.

II. *LAMPROCHERNES* Tömösváry

Lamprochernes Tömösváry (1882, p. 185). Genotype by subsequent designation of Beier (1932*c*, p. 82): *Chelifer nodosus* Schrank.

Lamprochernes Tömösváry. Beier (1932*c*, p. 82).

The genus *Lamprochernes* is characterized by the absence of an accessory tooth on the tarsal claws of the legs and by the position of the tactile setae of the fixed chelal finger, *it* always being clearly farther from the finger tip than *ist* is from *isb*. Four nearctic species are known: *ellipticus* Hoff (1944*b*) from Mexico, *grossus* (Banks) from Colorado, and the two following.

Key to Species

Hand of chela subquadrate in dorsal view, subtruncate at base, fig. 30*A*; chela exclusive of pedicle usually less than 0.8 mm. long, length 2.4 to 2.6 times the width..**oblongus**

Hand of chela subovate, basal margin somewhat rounded, fig. 29*A*; chela exclusive of pedicle more than 0.8 mm. long, length 2.8 to 3.0 times the width.....**minor**

Lamprochernes oblongus (Say)

Chelifer oblongus Say (1821, p. 64).

Chelifer (Lamprochernes) oblongus (Say). Ellingsen (1909, p. 368).

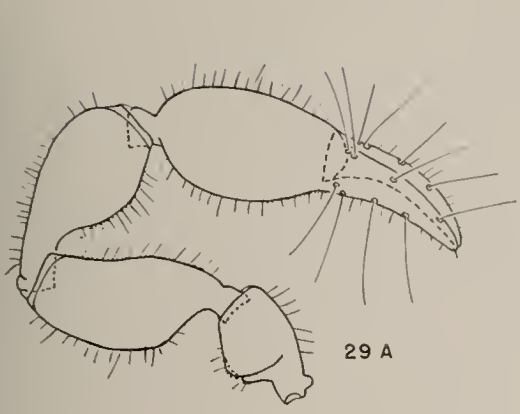
Chelanops oblongus (Say). Ewing (1911, p. 79).

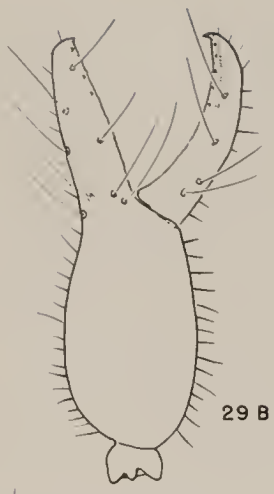
Lamprochernes oblongus (Say). Beier (1932*c*, p. 84).

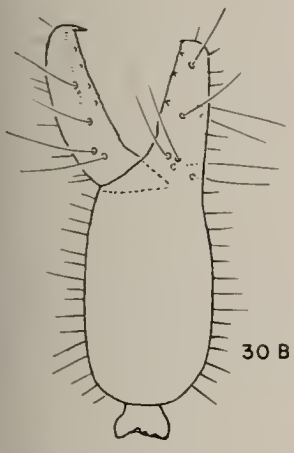
Since the type specimens deposited by Say in the Philadelphia Academy have apparently been lost, a neotype has been selected and deposited in the collection of the Illinois State Natural History Survey. A detailed description is given here of *oblongus* because no description is available in the literature except the very brief diagnosis given by Beier (1932*c*). Beier's diagnosis is possibly based on specimens from Pennsylvania reported by Ellingsen (1909) as being deposited in the Berlin Museum. Illinois specimens of this species agree well with Beier's description except that our specimens usually have slightly more slender chelae. This difference was noticed also in specimens from Arkansas and Georgia as previously reported (Hoff 1945*a*).

Ewing (1911) reported material from Marshall, Champaign, and Muncie, Illinois, under the name *Chelanops oblongus*. His material from Marshall, deposited in the Museum of Comparative Zoology, has been re-examined, but his specimens from the other localities were not available for study.

Male.—The following measurements and ratios are based on three males, including the neotype. Body slender and elongate; light brown in color with palps a deeper reddish-brown; length of body 1.75–2.1 mm. Carapace widest near the middle, a little narrower across the posterior margin; 8 or 10 setae along the posterior carapacic margin; two transverse furrows, the median one deeper than the posterior one; weak eye spots, hardly discernible in specimens treated in caustic; surface of carapace almost smooth; length of carapace 0.6–0.65 mm., greatest breadth 0.45–0.53 mm., posterior breadth 0.45–0.53 mm., ocular width usually about 0.32 mm. Abdomen subcylindrical, slender; tergites, except the first two to four and the eleventh, well divided; surface with very weakly developed scalelike sculpturing; tergal chaetotaxy ranging from about 10 setae on tergite I to as many as 8 or 10 setae on each tergal half in the central and posterior part of the abdomen. Sternites, except XI, weakly divided; usually eight or nine setae in each sternal half but only three or four marginal setae on each half of sternite IV; sternites with color and sculpturing much as on the ter-







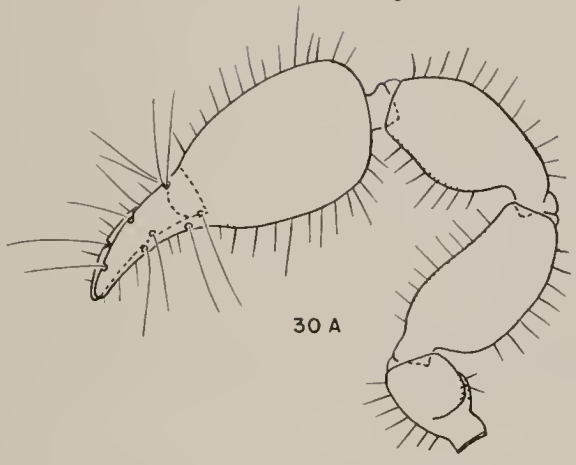


Fig. 29.—*Lamprochernes minor*, holotype ♂. *A*, dorsal view of palp; *B*, lateral view f chela.

Fig. 30.—*Lamprochernes oblongus*, neotype ♂. *A*, dorsal view of palp; *B*, lateral view f chela.

ites; each stigmatic plate with three setae; bdomen 1.2–1.5 mm. long, 0.5–0.7 mm. ide.

Chelicera.—Fig. 8. Yellow in color; fin- ers relatively slender; flagellum of three etae, of which the one farthest anteriad is nilaterally serrate along the distal one- alf; basal and subbasal setae relatively hort, each with a few very minute, sub- erminal denticulations; hand of chelicera ith netlike sculpturing on the anterior or orsal aspect; length of chelicera 0.17–0.19 m., width of base 0.1–0.11 mm. Fixed inger slender; inner aspect of apical tooth ith three denticles; inner finger margin ith four or five teeth, of which the two or three basal ones are very weakly developed; serrula interior with the four distal plates free. Movable finger straight; subapical lobe stout, well developed, and located very close to the base of the apical tooth; apical tooth with a tendency to form two or three poorly developed terminal cusps; galeal seta not reaching to the tip of the galea; galea long, slender, usually with six simple rami in the distal one-half; serrula exterior of 17 to 18 ligulate plates; length of movable finger 0.145–0.16 mm.

Palp.—Fig. 30*A*. Stout, usually deep reddish-brown in color, occasionally lighter; setae fairly numerous, long, appearing acuminate but usually with one to a few

minute, subterminal spinules; surface of segments smooth except for minute granules on the flexor surface of the femur, on the flexor surface and the protuberances of the trochanter, on the flexor surface of the tibia, and usually on the inner surface of the chelal hand near the finger base. Maxilla with ventral face subtriangular in outline; length about 0.3 mm. Trochanter with both sublateral and subdorsal protuberances little elevated; length of trochanter 0.27–0.31 mm., 1.8 to 1.9 times the width in strict dorsal view. Femur with pedicle a little wider than long, well separated from the rest of the segment; flexor margin S-shaped, extensor margin flatly convex in the central portion; length measured along the extensor margin 0.41–0.45 mm., 2.0 to 2.1 times the maximum width; over-all or greatest length 0.45–0.48 mm., 2.2 to 2.3 times the width; width between 0.195 and 0.215 mm. Tibia with a pedicle about as long as wide; tibia much swollen and globose beyond the pedicle; length 0.415–0.465 mm., width 0.21–0.24 mm., length 1.9 to 2.0 times the width. Chela viewed from dorsum with hand heavy and somewhat subquadrate; fingers stout and a little curved; hand basally subtruncate; length of chela without pedicle 0.69–0.77 mm., width 0.27–0.315 mm., length 2.4 to 2.6 times the width; chelal hand without the pedicle 0.4–0.43 mm. long, depth usually less than the width and between 0.24 and 0.31 mm.; movable chelal finger 0.3–0.36 mm. long. Viewed laterally, fig. 30*B*, chelal hand subquadrate, dorsal and ventral margins weakly convex, basal margin well rounded and not subtruncate; fingers stout; the fixed finger nearly straight, the movable finger slightly curved; movable finger conspicuously shorter than the hand without the pedicle. Marginal teeth of fingers cuspid, conical, and contiguous; usually 25 to 30 teeth on each finger; in most specimens, from 2 to 4 (rarely only 1) accessory teeth in each row, with the greater number in the external row of each finger. Tactile setae arranged as in fig. 30*B*.

Legs.—Yellow in color, often with an orange tinge; segments stout; surface often marked by netlike or scalelike markings. First leg with trochanter 0.1–0.12 mm. long, length 1.1 to 1.25 times the depth; pars basalis 0.1–0.11 mm. deep; pars tibialis 0.105–0.125 mm. deep, both margins evenly convex; entire femur 0.3–0.35 mm. long, 2.7 to 2.9 times the depth; tibia weakly S-shaped, 0.23–0.26 mm. long, 0.075–0.085 mm. deep, length 3.0 to 3.1 times the depth; tarsus subcylindrical in outline, about 0.2 mm. long, 0.05–0.055 mm. deep. Fourth leg with both margins of the femur evenly and weakly convex, 0.41–0.47 mm. long, 0.145–0.167 mm. deep, length 2.7 to 2.8 times the depth; tibia 0.31–0.355 mm. long, length 3.3 times the depth; tarsus subcylindrical, 0.23–0.27 mm. long, 0.06–0.068 mm. deep, length 3.7 to 4.0 times the depth; tactile seta of the tarsus removed from proximal margin by 0.06–0.08 mm.

Genital Complex.—Posterior operculum with 8 to 10 setae arranged chiefly in a row along the margin and with 4 to 6 setae on the posterior rim of the aperture. Anterior operculum with 18 to 24 scattered setae.

Female.—Measurements and ratios based on three individuals. Almost identical in detail with the male; body length 2.35–2.5 mm.; carapace 0.62–0.68 mm. long, 0.49–0.53 mm. wide; abdomen 1.7–1.85 mm. long, 0.75–0.9 mm. wide.

Chelicera.—No sexual dimorphism exhibited; length of chelicera 0.185–0.2 mm., base 0.105–0.115 mm. wide; movable finger 0.155–0.17 mm. long.

Palp.—In general as in male; trochanter 0.3–0.31 mm. long, about 0.17 mm. wide; femur with extensor margin 0.43–0.45 mm. long, greatest length 0.475–0.5 mm., width 0.2–0.22 mm.; tibia 0.45–0.48 mm. long, 0.23–0.24 mm. wide; chela without pedicle 0.75–0.8 mm. long, 0.3–0.305 mm. wide; chelal hand without pedicle 0.42–0.44 mm. long, 0.25–0.28 mm. deep; movable finger 0.35–0.38 mm. long.

Legs.—As in the male. First leg with entire femur 0.33–0.355 mm. long, 0.12 mm. deep across the pars tibialis; tibia 0.25–0.26 mm. long, 0.08–0.085 mm. deep; tarsus 0.205–0.235 mm. long, 0.055–0.057 mm. deep. Fourth leg with entire femur 0.45–0.48 mm. long, depth across the pars tibialis 0.165–0.168 mm.; tibia 0.335–0.355 mm. long, 0.1–0.105 mm. deep; tarsus 0.24–0.275 mm. long, 0.065–0.072 mm. deep; tactile seta of tarsus between 0.055 and 0.075 mm. from the proximal margin.

Genital Complex.—Usually 8 to 10 setae in a marginal row along the posterior operculum; anterior operculum with 6 to 8 setae posteriad to a compact median group of 10 to 14 setae.

Neotype, male.—Havana, Illinois, duff in forest, Nov. 9, 1943, Ross & Sanderson.

DISTRIBUTION.—This species is widespread east of the Great Plains area. In all, 4 collections of *oblongus* have been identified from scattered localities over Illinois. Almost invariably, this species is taken from under the bark of oak logs and stumps, as indicated both by Ewing's collections and by the present series. Rarely the species is taken from woody debris and even more rarely from ground cover.

Illinois Records.—ASTORIA: under oak bark, Nov. 1, 1943, Ross & Sanderson, 6 ♀, 3 ♂, 2 nymphs. AURORA: Sept. 4, 1939, H. Dybas, 1 ♀ (JC). BENTON: May 31, 1945, . Whitlow, 7 specimens. ELSAH: May, 946, C. L. Remington, 2 ♂ (CR). GRAND OWER: under bark of log, March 18, 1943, oss & Sanderson, 3 ♀. HAVANA: ground ver in forest, Nov. 9, 1943, Ross & Sanderon, 2 ♂. LYONS (Cook County): Bemis Woods, under bark of oak log, June 27, 1944, . L. Remington, 1 ♀. MARSHALL: under ark of log, Feb. 6, 1909, H. E. Ewing, 1 pecimen (MCZ). QUINCY: Coe's Spring, ark removed from old log suspended over ream, Jan. 4, 1943, C. C. Hoff, 1 nymph; outh of St. Anthony's Church, under bark f old snag in pasture, July 8, 1944, C. C. Ioff, 1 nymph, 1 ♀ (CH). SILOAM: Siloam prings, under bark of log, Oct. 8, 1945, . C. Hoff, 1 ♀ (CH). URBANA: Dodson's Woods, under bark of fallen white oak, une 6, 1927, Miller, 1 ♀ (JC). ZEIGLER: Oct. 11, 1933, Frison & Ross, 1 ♂.

Lamprochernes minor new species

This species, figs. 29*A*, 29*B*, is readily eparated from *oblongus* by the shape of he palpal chela. In many respects, this new pecies shows much closer affinity to Eurolean and North African species than it does o *oblongus*. The closest relationship appears o be with *nodosus* (Schrank) and *chyzeri* Tömösváry. From these two forms, *minor* nay be separated by the more granular carapace and differences in the shape of the palal femur.

MALE.—Description based on the male olotype. Body slender, legs moderately tout, palps stout; body and legs light brown n color, the palps deeper brown; length of ody 2.18 mm. Carapace rounded anteriorly, ides somewhat convex, widest near the enter; two well-marked, transverse furows, the posterior one very little closer to he posterior carapacic margin than to the nedian furrow; no eye spots observed; about 10 setae along the posterior carapacic margin; carapace moderately granular except on the dorsal surface anteriad to the posterior carapacic furrow; length of carapace 0.71 mm., greatest width 0.51 mm., width across the posterior margin 0.48 mm. Tergites, except I, II, and XI, completely divided; surface with scalelike markings; first tergite with 18 setae, second tergite with 18 to 20 setae, about 12 setae on each half-tergite of the central portion of the abdomen; all setae acuminate. Sternites divided; sculpturing as on the tergites; each fourth sternal half with 11 to 12 setae excluding those associated with the stigmata; each sternal half of the central part of the abdomen with as many as 18 setae. Each anterior stigmatic plate with three setae, each posterior plate with four; pleural membranes marked by numerous parallel striations; abdomen about 1.5 mm. long, width about one-half the length.

Chelicera.—Essentially as described above for *oblongus*; serrula exterior with 16 ligulate plates; length of chelicera approximately 0.17 mm., width of base about 0.115 mm., length of movable chelal finger 0.165 mm.

Palp.—Fig. 29*A*. Brownish-orange to golden in color; setae numerous and acuminate to subacuminate, frequently with a few subterminal and terminal spinules; segments stout to very stout; the sides of the maxilla, the entire trochanter, and the inner or flexor surfaces of the femur, tibia, and chela moderately granulate; also weakly granulate on the extensor surface of the chelal hand near the finger base. Maxilla 0.345 mm. long, about 0.21 mm. wide. Trochanter with well-developed subdorsal and sublateral protuberances, the former anterior to the latter; pedicle aboot as long as wide; trochanter 0.32 mm. long, about 0.2 mm. wide. Femur very stout; inner margin distinctly S-shaped; extensor margin markedly convex; pedicle about as long as wide, a distinct notch near the distal end of the flexor margin; length measured along the extensor margin (but not following the curvatures) 0.52 mm., greatest length 0.56 mm., width 0.24 mm. Tibia club shaped, swollen beyond the pedicle, which is much longer than wide; inner margin evenly convex beyond the pedicle; extensor margin flattened at least in the basal one-half and convex beyond; 0.545 mm. long, 0.248 mm. wide. Chela with the hand suboval in outline, fingers a little curved and fairly stout;

flexor margin of chelal hand moderately convex and extending without interruption into the basal margin; extensor margin less convex but not flatly convex; pedicle about as long as wide; chela, without pedicle, 0.85 mm. long, 0.29 mm. wide; chelal hand, without pedicle, 0.45 mm. long, 0.275 mm. deep; movable finger 0.43 long. As viewed from side, chelal hand, fig. 29*B*, subovate; fixed finger straight, movable finger curved; fingers gaping when closed; marginal teeth contiguous, cuspid, about 35 on each finger; fixed finger with three external and two internal accessory teeth; movable finger with five external and one internal accessory teeth; nodus ramosus of movable finger about two areolar diameters proximad from tactile seta *t*. Tactile setae placed as shown in the figure.

Legs.—First and second legs weakly granulate, granules merging into scalelike sculpturing on the third and fourth legs; setae acuminate, fairly numerous. First leg with pars basalis 0.113 mm. deep; pars tibialis with both margins moderately convex, 0.113 mm. deep; entire femur 0.35 mm. long; tibia very weakly S-shaped, 0.262 mm. long, 0.076 mm. deep; tarsus subcylindrical, 0.225 mm. long, 0.053 mm. deep. Fourth leg with extensor margin of femur evenly convex, flexor margin nearly straight; pars basalis 0.132 mm. deep, pars tibialis 0.165 mm. deep; entire femur 0.49 mm. long; tibia with flexor margin weakly convex, extensor margin nearly straight except at the base, a tactile seta on the extensor margin very near the distal end, tibia 0.38 mm. long, 0.102 mm. deep; tarsus subcylindrical, 0.274 mm. long, 0.07 mm. deep; tactile seta of tarsus located 0.1 mm. from the proximal margin.

Genital Complex.—Anterior operculum with 30 scattered setae; posterior operculum with 18 to 20 setae arranged chiefly in a marginal row and with two pairs of setae on the posterior rim of the aperture.

FEMALE.—Measurements and ratios based on three individuals, including the allotype. Like the male except as noted below. Each fourth sternal half usually with four setae. All tergites except the eleventh frequently divided. Body 2.0–2.5 mm. long; carapace 0.65–0.73 mm. long, 0.55–0.6 mm. wide; posterior width between 0.5 and 0.6 mm.; abdomen 1.3–1.85 mm. long, width equal to about one-half the length.

Chelicera.—Between 0.18 and 0.19 mm. long, base between 0.115 and 0.135 mm. wide; movable finger 0.16–0.18 mm. long; serrula exterior with 16 to 18 ligulate plates.

Palp.—Maxilla 0.32–0.35 mm. long, 0.22–0.24 mm. wide. Trochanter 0.31–0.355 mm. long, 0.19–0.22 mm. wide, length about 1.6 times the width. Femur 0.48–0.56 mm. in length along the extensor margin, 0.22–0.255 mm. wide, length along the extensor margin about 2.2 times the width; greatest length 0.54–0.6 mm., 2.35 to 2.45 times the width. Tibia 0.515–0.585 mm. long, 0.225–0.27 mm. wide, length 2.15 to 2.3 times the width. Chela without pedicle 0.84–0.93 mm. long, 0.28–0.335 mm. wide, length 2.78 to 2.97 times the width; chelal hand exclusive of pedicle 0.445-0.51 mm. long, depth a little less than the width; movable finger 0.435–0.48 mm. long. Chelal fingers with usually 30 to 35 marginal teeth; 4 to 5 teeth in the external row of accessory teeth on each finger and 1 or 2 in the internal row on each finger. Tactile setae located essentially as in the male.

Legs.—Segments of first leg measure as follows: pars basalis 0.11–0.135 mm. deep; pars tibialis 0.107–0.13 mm. deep; entire femur 0.35–0.385 mm. long, 2.85 to 3.18 times the depth; tibia 0.255–0.285 mm. long, 0.074–0.087 mm. deep, length 3.28 to 3.47 times the depth; tarsus 0.22–0.24 mm. long, 0.053–0.059 mm. deep, length 4.08–4.22 times the depth. Fourth leg: pars basalis 0.13–0.152 mm. deep; pars tibialis 0.152–0.177 mm. deep; entire femur 0.49–0.56 mm. long, length 3.12 to 3.22 times the depth; tibia 0.373–0.405 mm. long, 0.1–0.113 mm. deep, length 3.58 to 3.85 times the depth; tarsus 0.277–0.3 mm. long, 0.068–0.07 mm. deep, length 3.95 to 4.07 times the depth; tactile seta of tarsus located 0.085–0.1 mm. from the proximal margin.

Genital Complex.—Anterior operculum with 22 to 24 (in one individual, only 17) setae; posterior operculum with a row of 10 setae.

Holotype, male.—Urbana, Illinois, March 27, 1938, H. H. Ross.

Allotype, female.—Same data as for holotype.

Paratypes.—ILLINOIS.—URBANA: Same data as for holotype, 2 ♀. ROCHESTER, Sangamon County, Oct. 3, 1943, H. R. Lowenstam, 1 ♀ (IMI).

The Urbana collection was from a rotten log; the Rochester collection, from the underside of a stone slab in a yard.

Subfamily CHERNETINAE

This subfamily constitutes the most conspicuous and important group in our fauna. A member of the subfamily may be recognized by the straight or evenly convex posterior margin of the carapace; by the many short and either toothed or more or less club-shaped setae of the palps and dorsum of the body; and by the tactile seta of the fourth tarsus being located near the middle, or distad from the middle, of the segment.

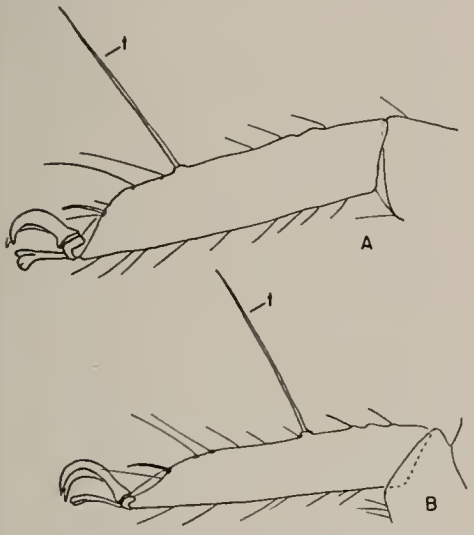


Fig. 31.—Tarsus of fourth leg showing tactile seta, *t*. *A*, *Parachernes squarrosus* ♂; *B*, *Pselaphochernes parvus* ♀.

The present scheme of classification within the subfamily is entirely unstable and unsatisfactory. In order to circumvent confused concepts of some older genera, the writer has established several new ones even though there is a possibility that one or more of these may later lapse into synonymy. A comprehensive revision of the entire subfamily is needed.

In the following key to genera, two points may give the student considerable trouble. The setae on the flagellum of chelicera, mentioned in couplet 8, are often difficult to distinguish, and therefore observations should be made of several specimens whereever possible. Great care must be taken with respect to identification of the tactile seta of the fourth pedal tarsus mentioned in couplet 12, since the seta is easily broken and lost. Also, the seta may be of reduced size. If it is, there is sometimes confusion over whether or not a true tactile seta is present. A true tactile seta varies from an ordinary seta of the vestiture by having greater length, by being entirely acuminate, and by being directed at more of a right angle to the surface of the segment, fig. 31.

KEY TO GENERA

1. Cheliceral galea about two-thirds as long as the movable cheliceral finger..... ..... **23. Genus? corticis**
   Cheliceral galea much less than two-thirds as long as the movable finger of the chelicera.....2
2. Internal surface of chelal hand with a large, projecting, anvil-shaped structure, fig. 45*C*. Males of..... ..... **21. Mirochernes**
   Internal surface of chelal hand without such projection.....3
3. All interior setae of fixed chelal finger grouped in the basal portion of the finger, fig. 32*E*..... **12. Parachernes**
   At least *it* situated beyond middle of fixed finger.....4
4. Palp slender, palpal femur about four times as long as wide..... ..... **17. Pseudozaona**
   Palp less slender, moderate to very stout.....5
5. Setae of palp leaflike and bilaterally feathered..... **22. Illinichernes**
   Setae of palp otherwise.....6
6. Tactile seta *st* of movable chelal finger closer to *sb* than to *t*..... ..... **15. Dendrochernes**
   Tactile seta *st* midway between *sb* and *t* or nearer the latter.....7
7. Tactile seta *ist* of fixed chelal finger on the same level as *est* or a little proximad to *est*.....8
   Tactile seta *ist* distad from *est*.....9
8. Cheliceral flagellum composed of four setae; no tactile seta on fourth pedal tarsus; in our form, the palpal femur and tibia each have a length greater than 0.75 mm..... **13. Chelanops**
   Flagellum composed of three setae; a tactile seta present on fourth pedal tarsus; length of femur and of tibia less than 0.6 mm..... ..... **14. Pselaphochernes**
9. Setae *b* and *sb* of cheliceral hand thickened and denticulate..... ..... **19. Hesperochernes**
   Not as above, at least seta *b* acuminate.. 10
10. Both seta *b* and seta *sb* of cheliceral hand acuminate..... **20. Acuminochernes**
    Seta *b* of cheliceral hand acuminate, *sb* denticulate.....11
11. Palp with following combination of

characters: length-width ratio of palpal femur about 2.3:1; length of chela exclusive of the pedicle divided by length of femur usually between 1.7 and 1.8; length of chela greater than 1.0 mm.; length of femur more than 0.6 mm.; tactile seta present on tarsus of fourth leg. Females of.....**21. Mirochernes**

Some other combination of palpal characters; tactile seta absent from or present on tarsus of fourth leg.....12

12. No tactile seta on tarsus of fourth leg; combination of length-width ratio of femur 2.3–2.5:1 and of chela 2.6–2.75:1 .....**16. Reginachernes**

Tactile seta present on tarsus of fourth leg; Illinois species having a similar length-width ratio of both femur and chela (exclusive of pedicle) of palp, either both greater than 2.6, or both less than 2.5.....**18. Dinocheirus**

12. *PARACHERNES* Chamberlin

Parachernes Chamberlin (1931*b*, p. 192). Genotype, by original designation: *Parachernes ronnaii* Chamberlin.

Parachernes Chamberlin. Beier (1932*c*, p. 116).

Members of this genus can be recognized by the grouped condition on the fixed chelal finger of the tactile setae *it, ist, isb,* and *ib,* with *it* clearly farther from the finger tip than from *isb,* fig. 32*E*; flagellum of three setae; eye spots mostly present; tergites divided; setae of body and palp toothed or feathered, seldom lightly clavate; tactile seta *st* of movable chelal finger only a little nearer to *sb* than to *t* or standing in the middle between the two, fig. 32*E*; tactile seta of the fourth pedal tarsus located distad from the mid-point of the segment. A single species is known from the north-central states.

Parachernes squarrosus new species

Chelanops pallidus Ewing (1911, p. 78), (*non Chernes pallidus* Banks). Misidentification.

The present species figs. 32*A*–32*E*, bears considerable relationship to two species described by Nathan Banks, *Parachernes pulchellus* from Texas and *virginicus* from Virginia. From *pulchellus, squarrosus* may be distinguished by the absence of silver blotches on the outer ends of the abdominal tergites and by the flatly convex rather than evenly convex outer margin of the palpal femur. From *virginicus,* this new species can be distinguished by the more granular nature of the palpal segments, the fewer plates in the serrula exterior, and the slightly different size and length-width ratio of the palpal femur.

Among the local fauna, *squarrosus* can be identified readily on the basis of the lightly colored silver blotches along the posterior margin of the carapace. No other Illinois pseudoscorpion has such a pigment pattern.

Two specimens from Ewing's collections were found to belong to this species. One specimen, a female, deposited in the Museum of Comparative Zoology, had been labeled *Chelanops virginica* but this name had been deleted and the identification *C. pallidus* supplied. This specimen was apparently reported by Ewing (1911) under the name *pallidus* from "under bark" at Arcola, Illinois. The date of collection of this specimen was June 12, 1908. The second specimen available from the Ewing collections is a male deposited at the Cornell University Museum. The slide of this specimen bears the deleted name *Chelanops pallidus,* which was replaced by the identification *Chelanops sanborni.* The specimen was taken under the bark of a living oak tree at Marshall, Illinois, on October 10, 1908. Since Ewing (1911) reported *pallidus* but not *sanborni* from Marshall, this specimen was probably reported as *pallidus.*

The erroneous identification of the present species as *pallidus* (Banks) is easily explained since, during the time Ewing worked, generic and specific characters were poorly understood and inadequately described. We now know that the species *pallidus* belongs to the genus *Dinocheirus* as indicated elsewhere in this paper. Cleared specimens of *Dinocheirus pallidus* and *Parachernes squarrosus* are superficially similar and can easily be confused. However, the cheliceral flagellum of *pallidus* has four setae while there are only three setae in the cheliceral flagellum of *squarrosus.*

MALE.—Measurements and ratios are given as the limits of variation of three individuals, including the holotype. Body and palps fairly stout, legs moderately slender; body and appendages for the most part distinctly granular; color varying from yellow on the legs to reddish or golden brown to brown on the palps and carapace, and dark brown on the tergites; body 1.8–1.9 mm. long. Carapace, fig. 32*A*, with surface coarsely granular except for a transversely placed white blotch along the posterior margin on each side of the median line; posterior mar-

gin with 8 to 12 subclavate to clavate marginal setae placed just anteriad to the white blotches; anterior margin weakly convex, with four stout setae, each with a few subterminal and terminal denticulations; carapace narrowed rapidly anteriad to the mid-point, posterior portions of lateral margins of two sides nearly parallel; the median transverse furrow near the mid-point of the face of the carapace, the posterior furrow anteriad to the white blotch of each side and a little closer to the posterior carapacic margin than to the median furrow; setae of face and sides of carapace short, slender, subclavate or paucidenticulate; a single pair of eye spots; carapace 0.65–0.7 mm. long, width just posteriad to the center of the carapace 0.5–0.6 mm.; ocular width about 0.3 mm. Abdomen suboval in general shape; 1.1–1.3 mm. long; 0.8–0.9 mm. wide. Tergites except the eleventh divided; dark brown in color; granulations very similar to those of the carapace; the medial end of some of the tergites lighter in color than the rest of the tergite; the lateral ends of tergites not bearing lightly colored blotches; each tergite with a single row of marginal setae and, in addition, frequently with a lateral seta at each outer end of the tergite; setae of all but the eleventh tergite weakly clavate; four to seven setae on each half-tergite; eleventh tergite with four to five pairs of subacuminate to acuminate setae. Sternites 4 through 10 divided; sternites dark brown, surface marked by scalelike or netlike impressions; setae acuminate, moderately long, very slender; fourth sternite with eight setae; each of sternites 5 through 10 with 12 to 18 setae; sternite 11 with three pairs of setae, the medial and lateral pairs of which are very long. Pleural membranes with wavy parallel striations; anterior stigmatic plate with one or two acuminate setae, posterior plate with one.

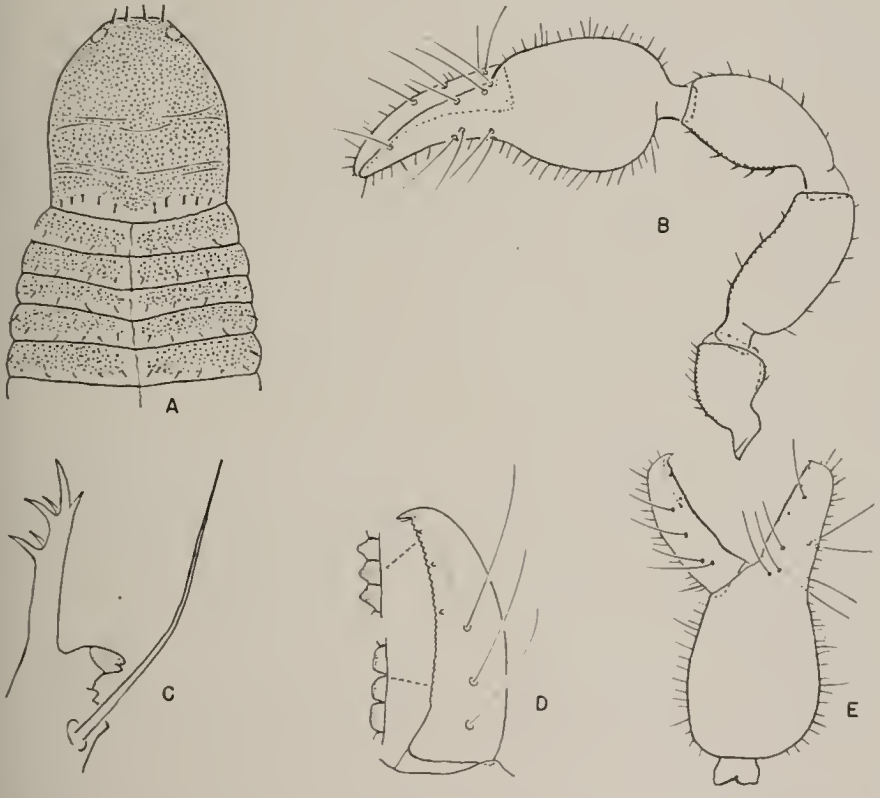


Fig. 32.—*Parachernes squarrosus*. *A*, dorsal view of carapace and five anterior tergites, holotype ♂; *B*, dorsal view of palp, holotype ♂; *C*, galea and tip of movable cheliceral finger, paratype ♂; *D*, lateral view of movable chelal finger with teeth enlarged, paratype tritonymph; *E*, lateral view of chela, allotype ♀.

Chelicera.—Light brown in color, sometimes with a greenish tinge; 0.185–0.19 mm. long, base about 0.12 mm. wide; movable finger 0.16–0.17 mm. long. Flagellum of three setae, the longest having six to eight fine denticulations along the distal half of the anterior margin. Fixed finger with conspicuous lamina exterior; most teeth of the serrula interior fused, but the distal four teeth free and with serrate margins; inner margin of finger with three retroconical teeth near the distal end; apical tooth acute and with three small, rounded denticles on the inner surface. Movable finger, fig. 32*C*, fairly stout, slightly curved; apical tooth well developed, terminally split to form two cusps; subapical tooth weakly developed, located just distad from the insertion of the galeal seta; two small, conical denticles or accessory teeth sometimes found on the inner margin of the movable finger between the subapical tooth and the base of the apical tooth; galeal seta extending slightly beyond the tip of the galea; serrula exterior of 19 to 21 ligulate plates; galea fairly stout and straight, with six or seven simple rami confined to the terminal one-half or one-third of the galea; considerable variation in the stoutness of the galea.

Palp.—Fig. 32*B*. Lateral surface of maxilla, all surfaces of trochanter, and the flexor surfaces of the femur and tibia coarsely granulate; rest of palp weakly granular to smooth; setae varying from acuminate to subclavate and paucidenticulate. Maxilla with acuminate and slender setae; 0.295–0.305 mm. long, 0.22–0.23 mm. wide, length 1.35 to 1.4 times the width. Trochanter with inner margin regularly convex, surface bearing numerous short setae with terminal and subterminal denticulations; a well-rounded, dorsolateral protuberance present; trochanter 0.24–0.26 mm. long, 0.17–0.175 mm. wide. Femur with pedicle wider than long, well separated from the rest of the segment; extensor margin flatly convex, except at the ends; flexor margin distinctly S-shaped, concave in the distal half of the segment but distinctly convex in the proximal portion; granulations coarser and much more marked on the medial than on the sometimes nearly smooth, outer surface; setae of the medial surface sparse and subclavate, setae of the lateral surface somewhat longer and with few denticulations; femur 0.48–0.505 mm. long, 0.19–0.22 mm. wide, length 2.3 to 2.5 times the width. Tibia pedicellate, with pedicle about as long as wide; outer margin of tibia including the pedicle evenly convex; inner margin centrally bulged and convex but slightly flattened in the distal one-third; setae much as in the femur; flexor or medial surface coarsely granulate; outer or lateral surface virtually smooth; 0.45–0.48 mm. long, 0.215–0.235 mm. wide, length 2.0 to 2.15 times the width. Chela stout; setae of hand relatively long, with one or two very fine submedial to subterminal denticulations on each; setae of fingers acuminate; hand with a few fine granulations on the inner aspect near the base of the fingers, otherwise smooth; flexor margin of chelal hand slightly more convex than the extensor; pedicle placed nearer the outer than the inner surface of the hand; fingers evenly curved; chela, without pedicle, 0.785–0.835 mm. long, 0.32–0.33 mm. wide, length 2.4 to 2.5 times the width; chelal hand 0.32–0.36 mm. deep, hand, without pedicle, 0.41–0.43 mm. long; movable finger about equal in length to length of hand without pedicle. As viewed from the side, dorsal margin of the chelal hand more convex than the ventral; the pedicle displaced toward the ventral side; fixed finger stout and nearly straight; movable finger distinctly curved. Marginal teeth of both fingers contiguous; distal teeth acute and each with a well-marked cusp, proximal teeth more rounded and with weak cusps; 30 to 35 marginal teeth on each finger; each finger with five to seven external and two or three internal accessory teeth. Tactile setae as in fig. 32*B*; nodus ramosus of movable finger located slightly proximad from the areole of tactile seta *t*.

Legs.—Surfaces, except the posterior, of the basal segments of legs fairly well marked by scalelike sculpturing, becoming weaker on the distal segments; setae variable. First leg with stout trochanter, 0.11–0.115 mm. long; pars basalis 0.115–0.12 mm. deep; pars tibialis almost smooth to coarsely granulate, 0.107–0.122 mm. deep; entire femur 0.3–0.35 mm. long; tibia with extensor margin weakly S-shaped, greatest depth in the distal one-fourth, 0.23–0.25 mm. long, 0.072–0.087 mm. deep, length 2.85 to 3.2 times the depth; tarsus subcylindrical, with weak sculpturing, setae not abundant, 0.23–0.24 mm. long, 0.053–0.057 mm. deep, length 4.2 to 4.4 times the depth. Fourth leg with pars basalis almost smooth, a few long acuminate setae on the flexor surface, subtriangular in

tline, 0.137–0.14 mm. deep; pars tibialis th anterior surface conspicuously sculp- red, posterior surface almost smooth, xor margin almost straight, 0.165–0.175 n. deep; entire femur 0.44–0.465 mm. ıg, length 2.65 to 2.75 times the depth; ia with extensor margin slightly S-shaped almost straight, 0.35–0.37 mm. long, 095–0.102 mm. deep, length 3.65 to 3.85 ıes the depth; tarsus subcylindrical, nu- rous acute setae on the flexor surface, a v relatively long and subterminally den- ulate setae on the extensor surface, weak- developed sculpturing, 0.28–0.30 mm. ıg, 0.065–0.0685 mm. deep, length 4.3 to 5 times the depth; a long and slender tac- e seta inserted 0.165–0.19 mm. from the oximal margin of the tarsus.

Genital Complex.—Anterior operculum th usually 8 to 12 marginal setae near e anterior margin of the genital aperture d with as many as 30 setae more anteri- ly located on the operculum; posterior erculum with 6 to 10 setae on the posterior of the genital aperture and 8 to 10 widely parated and very slender setae in a trans- rse row between the genital slit and the sterior margin of the operculum.

FEMALE.—Measurements and ratios based four individuals, including the allotype. general, much like the male; body length 85–2.20 mm.; carapace 0.675–0.75 mm. ıg, width 0.85 to 0.95 times the length; ular width 0.32–0.34 mm.; abdomen 1.15– 50 mm. long, 0.9–1.05 mm. wide.

Chelicera.—Similar to the male; 18 to 19 ıtes in the serrula exterior; length of elicera 0.2–0.215 mm., width of base 0.13– 14 mm., length of movable finger 0.175– 19 mm.

Palp.—Segments slightly larger than in e male but the length-width ratios almost entical in the two sexes; maxilla 0.33–0.35 m. long, 0.25–0.28 mm. wide, length 1.2 1.45 times the width; trochanter 0.26– 27 mm. long, 0.18–0.195 mm. wide, length 35 to 1.45 times the width; femur 0.52– 535 mm. long, 0.215–0.225 mm. wide, ngth 2.35 to 2.5 times the width; tibia 48–0.495 mm. long, 0.235–0.25 mm. wide, ngth 1.95 to 2.05 times the width; chela, ithout pedicle, 0.865–0.885 mm. long, 0.34– 375 mm. wide, length 2.37 to 2.55 times e width; chelal hand exclusive of pedicle 47–0.485 mm. long, 0.34–0.38 mm. deep; ovable finger 0.445–0.465 mm. long. eeth, both marginal and accessory, much as in the male except slightly more variation in number. Tactile setae arranged as in the male.

Legs.—Essentially as in the opposite sex; some segments, however, slightly larger in actual size and sometimes a little more extensively granulate. First leg with trochanter 0.115–0.125 mm. long; pars basalis 0.123–0.133 mm. deep; pars tibialis 0.12–0.13 mm. deep; entire femur 0.33–0.375 mm. long; tibia 0.24–0.26 mm. long, 0.08–0.085 mm. deep, length 2.8 to 3.05 times the depth; tarsus 0.235–0.255 mm. long, 0.06–0.065 mm. deep, length 3.8 to 4.2 times the depth. Fourth leg with trochanter 0.19–0.195 mm. long, length 1.3 to 1.65 times the depth; pars basalis 0.145–0.16 mm. deep; pars tibialis 0.17–0.19 mm. deep; entire femur 0.48–0.515 mm. long, length 2.6 to 3.0 times the depth; tibia 0.36–0.39 mm. long, 0.1–0.112 mm. deep, length 3.35 to 3.85 times the depth; tarsus 0.285–0.31 mm. long, 0.069–0.075 mm. deep, length 4.0 to 4.45 times the depth; sensory seta 0.175–0.195 mm. from proximal margin of tarsus.

Genital Complex.—Anterior operculum with between 20 and 25 (in one individual only 17) setae arranged chiefly in a medially placed triangular group; posterior operculum with six or eight widely scattered setae arranged in a single marginal row.

TRITONYMPH.—Description based on two individuals. Measurements of one are given in parentheses after the corresponding measurements of the other whenever the two differ significantly. Same general features as in the adult except that the body is less darkly colored and less sclerotic; length 1.65 mm. Carapace light yellowish-brown; white blotches near the posterior margin fused medially to form a single transverse bar anteriad to and isolating a small median pigmented area lying near the posterior margin of the carapace; carapace 0.55 (0.575) mm. long, with the greatest width but little less than the length. Abdomen much as in the adult; tergites, however, lighter in color and less sclerotic; setae of tergites less clavate and in some cases almost acuminate; sternites as in the adult except less darkly colored, not so coarsely granular, and with fewer setae.

Chelicera.—In general with the characteristics in the adult; serrula exterior with 16 or 17 ligulate plates; chelicera 0.16 (0.17) mm. long, base 0.1 (0.11) mm. wide, movable finger 0.15 mm. long.

Palp.—In general shape, chaetotaxy, and sculpturing much as in the adult; the pedicles of the femur and tibia are much wider than long and poorly separated from the rest of the segment; tibia a little stouter and the chela a little more slender than in the adult. Maxilla 0.285 mm. long, trochanter 0.205 (0.215) mm. long, femur 0.38 mm. long; tibia 0.355 (0.34) mm. long, 0.195 mm. wide; chela 0.695 (0.675) mm. long, 0.262 (0.258) mm. wide; chela depth about 0.26 mm., hand length 0.37 mm.; movable chelal finger 0.36 (0.35) mm. long. Marginal teeth, fig. 32*D*, of each finger between 25 and 30 in number; the distal 8 to 12 teeth of the marginal row of each finger acute and with well-formed cusps, other teeth blunt, rounded, with very weak cusps or without cusps; accessory teeth fewer in number and more weakly developed than in the adult. The three tactile setae of movable finger as shown in fig. 32*D*. Fixed finger with four tactile setae in external series, arranged much as in the adult male; internal series of three tactile setae with *it* slightly more than twice as far from the finger tip as from the level of *et* and somewhat distad from the level of *est*; *isb* and *ib* as in the adult; *ist* wanting.

Legs.—In general as in the male, except segments a little stouter, lighter in color, less sclerotic, and with fewer setae. First leg with entire femur about 0.25 mm. long; tibia with extensor margin straight except at the proximal end, 0.18 (0.175) mm. long, length 2.6 (2.4) times the depth; tarsus with both margins more convex than in the adult, 0.185 (0.19) mm. long, length about 3.2 times the depth. Fourth leg with pars basalis about 0.13 mm. deep; pars tibialis 0.15 (0.155) mm. deep; entire femur 0.375 mm. long, length 2.5 (2.4) times the depth; tibia with extensor margin almost straight, 0.29 (0.277) mm. long, 0.087 (0.08) mm. deep; tarsus with both margins conspicuously convex, 0.22 (0.225) mm. long, about 0.075 mm. deep; sensory seta of tarsus shorter than in the adult and inserted 0.115 (0.13) mm. from the proximal margin of the segment.

Holotype, male.—Fowler, Illinois: bark of oak tree, July 19, 1944, C. C. Hoff.

Allotype, female.—Karnak, Illinois: Feb. 24, 1933, Ross & Mohr.

Paratypes.—ILLINOIS.—ARCOLA: under bark, June 12, 1908, H. E. Ewing, 1 ♀ (MCZ). CARBONDALE: jarred from willow and sycamore branches, Sept. 22, 1908, L. N. Smith, 11 nymphs and adults. CENTRALIA: under pear bark, June 18, 1947, L. J. Stannard, 1 ♂. FOWLER: same data as for holotype, 1 ♂ (JC). KARNAK: same data as for allotype, 1 ♀. LAKE GLENDALE: ground cover, March 17, 1943, Ross & Sanderson, 1 nymph. MARSHALL: under bark of living oak tree, Oct. 10, 1908, H. E. Ewing, 1 ♂ (CU). QUINCY: near Benton's Cave, inner layer of bark on log, April 27, 1944, C. C. Hoff, 1 ♂ (CH); nest in bluebird box, Oct. 30, 1945, T. E. Musselman, 1 nymph (CH). URBANA: under bark of maple, June 18, 1942, K. M. Sommerman, 1 ♂; under bark, July 20, 1944, K. M. Sommerman, 1 ♀.

This species is usually found under the bark of deciduous trees or logs but may occasionally be taken in woody debris and forest ground cover. The tritonymph collected at Quincy by T. E. Musselman was taken from a nest in a bluebird box.

13. *CHELANOPS* Gervais

Chelanops Gervais, *in* Gay (1849, p. 13). Genotype, monobasic: *Chelifer (Chelanops) coecus* Gervais.

Chelanops Gervais. Beier (1932*c*, p. 177), Hoff (1947, p. 503).

Carapace somewhat longer than wide, granular; tergites divided, granular. Setae of body and palps somewhat variable, plumose, and usually appearing subclavate to clavate. Flagellum with four setae. Palp, fig. 33, moderately heavy, granular; tactile seta *ist* placed on the same level with *est* or a little proximad from *est*; *st* nearer to *t* than to *sb*. Tarsus of fourth leg without a tactile seta.

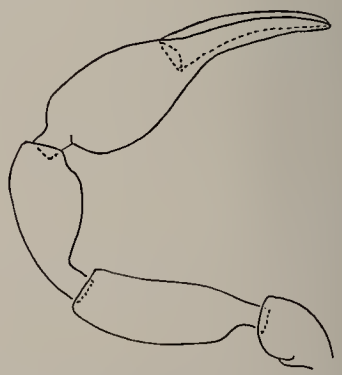


Fig. 33.—*Chelanops affinis* ♂. Dorsal view of palp (setae omitted).

The genus is confined to the Americas, chiefly South and Central America and the West Indies, and, as now limited, contains a small number of species. One species, *Chelanops affinis* Banks, is recorded from Florida. Many species were assigned to *Chelanops* by earlier authors, but most of them have been transferred to other genera.

14. *PSELAPHOCHERNES* Beier

Pselaphochernes Beier (1932*c*, p. 130), (1933, p. 520). Genotype, by original designation: *Chelifer scorpioides* Hermann.

Cephalothorax somewhat longer than wide, fig. 34*D*, fairly well granulated; setae of body and palps moderately long, toothed, and often lightly clavate; three blades in the cheliceral flagellum; a single internal accessory tooth on each chelal finger; fixed finger with short and vestigial venedens and duct; tactile seta *ist* of the fixed finger on about the same level as *est*. Internal series of tactile setae not forming a basal group, fig. 34*B*; seta *st* a little nearer to *t* than to *sb* or about midway between the two; tarsus of fourth leg with a tactile seta near the mid-point or slightly proximad from the mid-point of the segment.

Except for a doubtful record of the European *scorpioides* from the eastern United States, only the following species is known from the nearctic region.

Pselaphochernes parvus Hoff

Pselaphochernes parvus Hoff (1945*a*, p. 38).

Diagnostic characters of the species are illustrated in fig. 34. A full description of the female is given in the original description. Study of the present material has brought to light the undescribed male of the species and has led to a clearer demonstration of the differences between *parvus* and the closely related European species, *scorpioides* (Hermann). Several characteristics that can be expressed numerically serve to separate the two forms. The chela of the female of *parvus* has a length 2.9 to 3.15 times the width, while in *scorpioides* the chela is 2.7 times as long as wide; in the male of *parvus* the femur is 0.45–0.51 mm. long, in *scorpioides* 0.43 mm.; the chela of the male of *parvus* is 3.1 to 3.2, but in *scorpioides* 2.9, times as long as wide; in *parvus* the movable chelal finger of the male is 0.41–0.45 mm. long, in *scorpioides* 0.38 mm. Measurements for *scorpioides* have been taken from Beier (1932*c*). There is also a distinct difference between the two species in the amount of flattening of the outer margin of the chelal hand, our Illinois species, fig. 28, having a much more flattened margin than does *scorpioides* as figured by Beier (1932*c*). An atypical male in one of the collections appears to resemble the male of *scorpioides* as figured by Beier (1932*c*), but the length of the palpal segments and the somewhat flattened external margin of the chelal hand indicate that the individual is not *scorpioides*.

MALE.—Measurements and ratios are based on four individuals. Body moderately stout; yellow in color except for light brown or golden colored palps; 1.5–1.9 mm. long; carapace, fig. 34*D*, with straight to slightly convex posterior margin and with 8 to 10 marginal setae; anterior margin bluntly rounded and with four setae; anterior half of each lateral margin convex, posterior half of lateral margins straight and parallel; median and posterior transverse furrows not well marked; surface moderately granular, light brown in color; numerous setae scattered over the face and sides; setae subclavate, with a few terminal denticulations; no eye spots; length of carapace 0.53–0.61 mm., greatest width 0.45–0.51 mm. near center, posterior width almost equal to the greatest width. Abdomen 0.95–1.3 mm. long, 0.6–0.72 mm. wide; length 1.5 to 1.8 times the width. Tergites weakly sclerotic, inconspicuously divided except the eleventh; half-tergites each usually with five to seven (occasionally eight) widened and terminally paucidenticulate setae. Sternites 4 through 10 divided, most half-sternites with from 9 to 11 (occasionally more) acuminate setae, chiefly confined to a marginal row; fourth sternite with three to five setae forming a marginal row in each half-sternite. Pleural membranes marked by wavy, subpapillose, longitudinal plications. Each anterior stigmatic plate with one seta; each posterior plate with two.

Chelicera.—Length 0.175–0.195 mm., width 0.11–0.125 mm., the laminal and interior setae acuminate, simple, much longer than the basal and subbasal; basal, subbasal, and exterior setae denticulate along the distal fourth. Flagellum of three blades, the distal one bearing 10 to 12 denticulations on the anterior edge along the distal two-thirds. Fixed finger with well-developed lamina exterior; the serrula interior with five free and serrate marginal teeth, remain-

der fused into a velum; apical tooth with two or three internal denticles; the internal margin of finger with six or seven denticles arranged along the distal one-third of the finger. Movable finger, fig. 34*A*, 0.173–0.185 mm. long; serrula exterior of 18 ligulate plates, the basal one or two but little longer than the remainder; subapical lobe close to end of finger and subequal in size to the apical or terminal tooth; galeal seta extending just beyond the tip of the galea; galea less well developed than in the female, usually with two main rami, each of which is in turn branched or bifurcated.

Palp.—Fig. 34*C*. Moderately granular except that the fingers are smooth and the flexor surfaces of the femur and tibia are coarsely granular; setae subclavate to acuminate. Maxilla with scattered acuminate setae; 0.275–0.31 mm. long; length about 1.5 times the width. Trochanter with two protuberances, coarsely granular; numerous multidenticulate setae on inner surface; length 0.255–0.275 mm., 1.45 to 1.55 times the width. Femur with pedicle about as long as wide; extensor margin convex and with numerous setae varying from short and multidenticulate near the base to longer and paucidenticulate near the distal end; flexor surface coarsely granular and with a few setae like those of the trochanter; flexor margin weakly S-shaped; length measur along the extensor margin 0.45–0.51 mm maximum over-all length a little greate 0.17–0.195 mm. wide; length 2.55 to 2.(times the width. Tibia slightly shorter a wider than the femur; granulations a chaetotaxy much as in the femur; extens margin somewhat flatly convex but mo convex toward the distal end; flexor marg bulging in the center; 0.435–0.485 mm. lon 0.185–0.215 mm. wide; length 2.23 to 2.. times the width. Chela moderately slende hand granulate and with long subacumina setae, each with one or two subtermin denticulations; outer margin of chela flat convex, inner margin more convex; finge curved; chela 0.75–0.83 mm. long, 0.24–0.. mm. wide, length 3.1 to 3.2 times the widt 0.235–0.27 mm. deep; hand length witho pedicle 0.385–0.43 mm.; finger slightly long than hand without pedicle, measuring fro 0.41–0.45 mm. Viewed laterally, fig. 34 both dorsal and ventral margins of ha appear convex. Each finger with betwe 35 and 45 marginal teeth, contiguous, a with well-developed cusps; a single interi accessory tooth on each finger, locat slightly more than one-fourth of fing length from the tip; usually seven or eig exterior accessory teeth on each finge spaced along the distal three-fourths of t

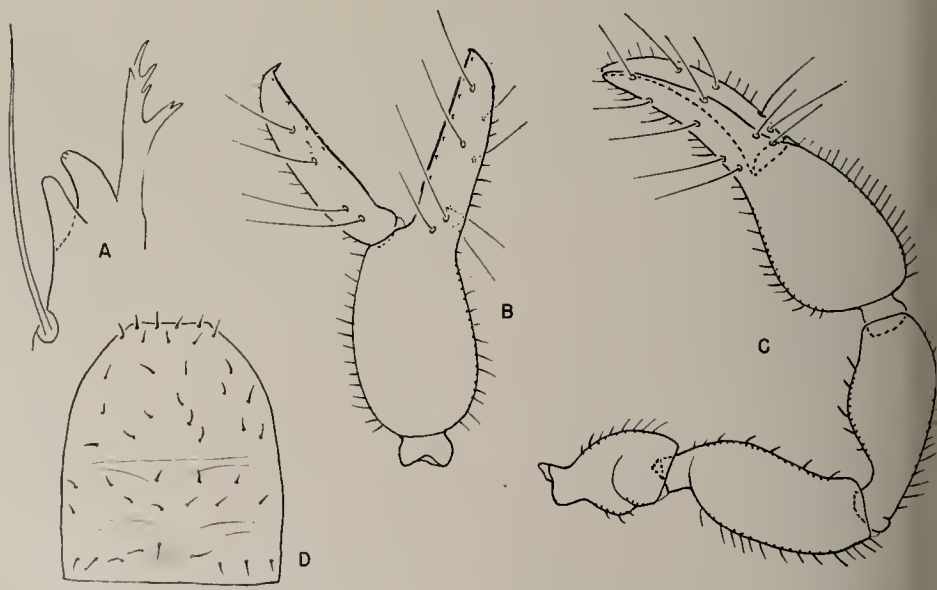


Fig. 34.—*Pselaphochernes parvus* ♂. *A*, tip of movable cheliceral finger; *B*, lateral vie of chelal hand; *C*, dorsal view of palp; *D*, dorsal view of carapace.

nger length. Tactile setae of chelal fingers s shown in the figure.

Legs.—Yellow to very pale brown in lor; moderately slender; subterminal setae nd tarsal claws simple and entire; surface sually weakly marked by scalelike lines; tae varying from paucidenticulate to cuminate. First leg with trochanter about 12 mm. long, several relatively long pauci- nticulate setae on flexor surface as well s a long acuminate pseudotactile seta; pars asalis 0.125–0.135 mm. long, length 1.2 to 4 times the depth; pars tibialis with a eakly convex extensor margin, flexor mar- n more weakly convex and almost straight, tae of extensor margin short and pauci- nticulate, those of flexor surface slightly nger and almost acuminate, length of pars bialis 0.183–0.23 mm., depth 0.08–0.114 m. length 2.0 to 2.3 times the depth; tibia ith a very weakly S-shaped extensor mar- n, flexor margin weakly convex, chaetotaxy s in the pars tibialis, tibia 0.23–0.26 mm. ng, 0.065–0.077 mm. deep, length 3.35 to 55 times the depth; tarsus with flexor mar- n slightly convex, extensor margin nearly raight, setae more numerous than on other gments, setae varying from terminally and bterminally denticulate on the basal part f the extensor surface to truly acuminate n the terminal portion of the segment; rsus 0.24–0.27 mm. long, 0.05–0.054 mm. ep, length 4.6 to 5.1 times the depth. ourth leg with chaetotaxy and sculpturing s in the first leg; trochanter with numerous tae, especially on the flexor surface, length 16–0.17 mm., 1.35 to 1.45 times the depth; rs basalis subtriangular, distal three- ourths of flexor margin straight, flexor sur- ce with numerous long and subacuminate tae, length 0.16–0.175 mm., 1.3 to 1.45 mes the depth; pars tibialis with extensor argin evenly and moderately convex, flexor argin straight and continuous with that of e pars basalis; pars tibialis 0.3–0.35 mm. ng, 0.122–0.15 mm. deep, length 2.3 to 45 times the depth; entire femur 0.42– 48 mm. long, length 3.2 to 3.45 times the pth; tibia with weakly S-shaped extensor argin and convex flexor margin, length 5 to 3.85 times the depth; tarsus with both exor and extensor margins weakly convex, ightly narrowed distally, deepest near the vel of the sensory seta, chaetotaxy much s in the tarsus of the first leg, 0.26–0.315 m. long, 0.065–0.07 mm. deep, length 4.4 4.0 in one individual) to 4.75 times the depth; sensory seta of the extensor surface of the tarsus located proximad from the mid-point of the segment, usually little more than 0.4 of the tarsus length from the proximal margin.

Genital Complex.—Anterior operculum with about 20 setae arranged in a crescent; posterior operculum with 8 to 10 (rarely 12) marginal setae; four (rarely five or six) setae on the posterior lip of the genital opening, almost within the opening, and anteriad to the marginal row.

FEMALE.—Females much more numerous than males. Female differing but little from male; slightly larger, up to 2.2 mm. or more in length, often a little more darkly pigmented than the male. Carapace and abdomen not distinctly different in the two sexes.

Chelicera.—Slightly larger and with the galea more branched than in the male; otherwise almost identical in the two sexes.

Palps.—Most segments, especially the chela, slightly larger than in the male; otherwise similar. Chela (measurements based on 16 Illinois specimens) exclusive of pedicle 0.85–0.95 mm. long, 0.27–0.31 mm. wide, length 2.9 to 3.15 (rarely less than 3.0) times the width; movable finger 0.45–0.51 mm. long. Teeth and tactile setae of chela as in the male; length-width ratios of chelae of Illinois specimens on the average slightly less than the ratios for the type specimens from Arkansas (Hoff 1945*a*).

Legs.—Shape, chaetotaxy, and sculpturing essentially as in the male; segments, however, frequently larger; length-depth ratios about the same in the two sexes. The following measurements and ratios of certain pedal segments in the female are based on measurements of nine individuals: tibia of first leg 0.255–0.295 mm. long, 0.072–0.08 mm. deep, length 3.4 to 3.85 times the depth; tarsus of first leg 0.27–0.3 mm. long, 0.053–0.059 mm. deep, length 4.6 to 5.2 times the depth; pars tibialis of fourth leg 0.35–0.4 mm. long, 0.135–0.155 mm. deep, length 2.45 to 2.75 times the depth; tibia of fourth leg 0.345–0.385 mm. long, 0.09–0.1 mm. deep, 3.7 to 4.2 times as long as deep.

Genital Complex.—Anterior operculum with 14 to 18 setae; posterior operculum with 8 or 10 setae.

TRITONYMPH.—Measurements are based on three individuals mounted in balsam. Much like the adult but smaller and lighter in color; appendages stouter. Body 1.35–1.55 mm. long; carapace about 0.5 mm. long

and about 0.4 mm. wide; abdomen between 0.6 and 0.7 mm. wide. Chelicera essentially as in the adult. Palpal segments conspicuously and coarsely granular on the flexor surfaces, other surfaces moderately granular; chelal hand moderately granular; trochanter 0.22–0.23 mm. long, 0.13–0.14 mm. wide; femur with maximum length between 0.33 and 0.35 mm., length along the extensor margin 0.3–0.32 mm., width 0.14–0.15 mm., greatest length 2.3 to 2.5 times the width, length along the extensor margin 0.21 to 0.23 times the width; tibia about 0.33 mm. long, 0.16 mm. wide; chela 0.61 mm. long, 0.205–0.21 mm. wide, length between 2.9 and 3.0 times the width; depth of chelal hand subequal to the width; chelal hand 0.32 mm. long; movable chelal finger 0.29–0.31 mm. long. Tactile setae of the chelal fingers much as in the adult except *b* is missing from the movable finger and *ist* is wanting from the fixed finger; also *it* is much closer to the level of *est* than to the level of *et*, while in the adult *it* is closer to the level of *et* than to the level of *est*. Marginal and accessory chelal teeth much as in the adult except fewer in number.

Deutonymph.—Two specimens examined. Smaller than the tritonymph but same general characteristics. Body length 1.0–1.05 mm., carapace about 0.38 mm. long. Serrula exterior of the movable cheliceral finger with 14 or 15 ligulate plates. Palpal segments smaller than in the tritonymph but with about the same length-width ratios. Palp with the following measurements (based on two individuals): trochanter about 0.17 mm. long, 0.1 mm. wide; femur with greatest length between 0.24 and 0.25 mm., width 0.11 mm.; tibia 0.23 to 0.24 mm. long, 0.12 mm. wide; chela exclusive of pedicle 0.45 to 0.46 mm. long, 0.148–0.155 mm. wide, length 2.9 to 3.1 times the width; chelal hand with length of 0.24 mm., depth about equal to the width; movable chelal finger 0.22 mm. long. Movable chelal finger with two tactile setae: one, probably *st*, near the mid-point of the finger and the second, probably *sb*, near the proximal margin; nodus ramosus a little distad from *st*. Fixed chelal finger with tactile setae much as in the tritonymph but with both *ist* and one of the external series, probably *esb*, wanting. Accessory teeth of chelal fingers apparently wanting.

Protonymph.—Somewhat smaller and with conspicuously stouter appendages than the deutonymph; body length about 0.9 mm. Serrula exterior of the movable cheliceral finger apparently of 11 plates. Chela exclusive of pedicle about 0.4 mm. long, about 0.14 mm. wide; chelal hand exclusive of pedicle 0.21 mm. long; movable finger equal in length to length of hand exclusive of pedicle. Movable finger with one tactile seta, probably *st*, located about two-fifths of the finger length from the proximal finger margin. Fixed finger with one tactile seta, probably *est*, located somewhat distad from the mid-point of the finger and one basal seta of the external series located near the finger base; internal series represented by a single tactile seta located about on a level with the single basal seta of the external series.

Distribution.—Known only from Arkansas and Illinois; taken from scattered localities in all areas of the latter state. Habitat data are available for 25 collections. Sixteen of these collections were made from rotting logs or hollow trees and, in two of these, nests of small mammals were present. The other collections were made from woody debris and ground cover. The collections indicate a decided association with rotting wood as a preferred habitat.

Illinois Records.—Thirty collections, taken throughout the year, are from Cache, Caledonia, Elk Grove, Elsah, Grand Tower, Harrisburg, Herod, Kampsville, Karnak, La Rue, Makanda, Monticello, Mount Olive, Pere Marquette State Park, Quincy, Sherman, Urbana.

15. *DENDROCHERNES* Beier

Dendrochernes Beier (1932*c*, p. 171). Genotype, monobasic: *Chernes cyrneus* L. Koch. *Dendrochernes* Beier. Hoff (1947, p. 536).

Carapace almost quadrate or a little longer than wide, weakly to moderately granular, the posterior transverse furrow nearer to the posterior carapacic margin than to the median transverse furrow. Tergites except the eleventh divided, finely to moderately granular. Setae of the body and palps toothed, not appearing clavate. Flagellum of four setae. Palp heavy, fig. 35, finely to moderately granular; tactile seta *ist* is almost at the same level as *est*, *st* is nearer to *sb* than to *t*. Tarsus of fourth leg with a sensory seta distad from the mid-point of the segment.

The genus is holarctic in distribution. In North America, *Dendrochernes morosus*

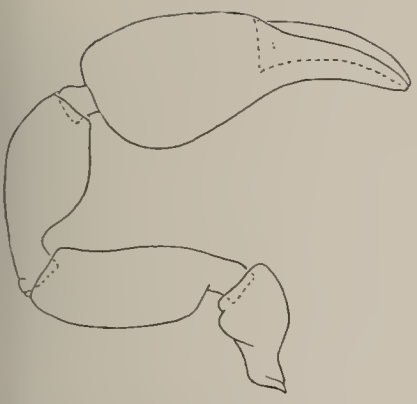


Fig. 35.—*Dendrochernes morosus* ♀. Dorsal ew of palp (setae omitted).

Banks) is recorded from Isle Royale, Lake perior.

16. ***REGINACHERNES*** new genus

DIAGNOSIS.—Chelicera with flagellum of ur setae; seta *b* of cheliceral hand acuinate, *sb* stout and subterminally denticute, fig. 36*D*; subapical lobe of movable eliceral finger well developed, figs. 36*E*, *C*, finger-like, and conspicuous; galea out, with several simple terminal and subrminal rami. Palp stout; tactile seta *st* movable chelal finger midway between *t* and *sb* or somewhat closer to *t* than to *sb*, *ist* of fixed chelal finger distad from *est*, figs. 36*A*, 37*B*; setae of palp subclavate to clavate; little sexual dimorphism exhibited by palp; fixed chelal finger with reduced venedens and short vestigial venom duct, fig. 36*B*. Fourth leg with no true tactile seta on the tarsus, but with a denticulate pseudotactile seta near the distal end. Seminal receptacle of the female in the form of a long and slender tubule with a terminal sac or bulb.

Genotype.—*Reginachernes ewingi* new species.

Because it lacks a tactile seta on the tarsus of the fourth leg, the present genus appears closely related to the genus *Hesperochernes* Chamberlin, but differs in having the tactile seta *b* of the cheliceral hand acuminate and not denticulate as in *Hesperochernes*. The genus *Reginachernes* also bears some resemblance to *Allochernes* Beier, but the two genera differ in number of setae in the cheliceral flagellum.

KEY TO SPECIES

Length of chela exclusive of pedicle less than 0.9 mm., length of femur less than 0.55 mm. ..... **ewingi**

Length of chela exclusive of pedicle more than 0.9 mm., length of femur more than 0.55 mm..... **lymphatus**

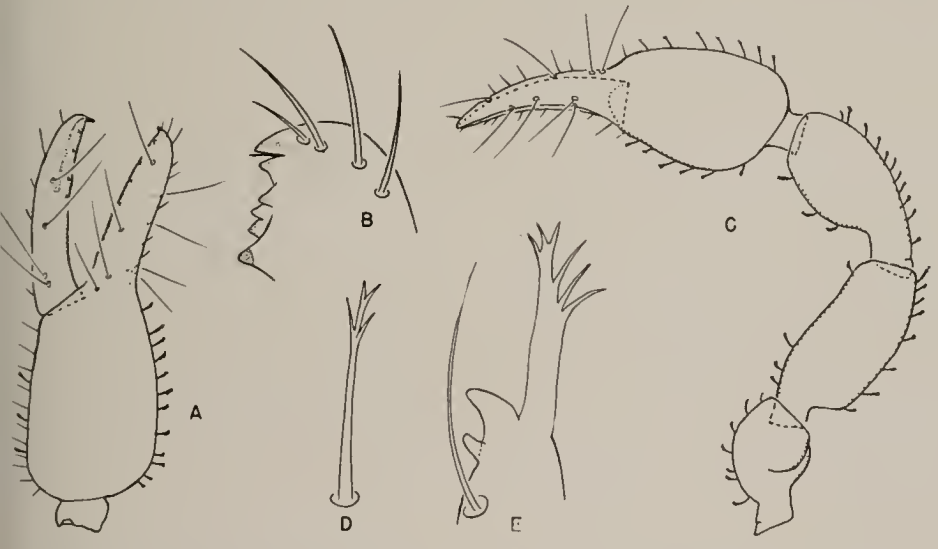


Fig. 36.—*Reginachernes ewingi*, holotype ♀. *A*, lateral view of chela; *B*, end of fixed helal finger to show vestigial venedens; *C*, dorsal view of palp; *D*, tactile seta *sb* of the heliceral hand; *E*, tip of movable cheliceral finger.

Reginachernes ewingi new species

Only two individuals, one male collected by Ewing more than 30 years ago, and one female, are available for study. Since the male is not in good condition for detailed examination, the female has been designated as the holotype fig. 36. The specimen collected by Ewing and deposited at the Museum of Comparative Zoology has, according to data accompanying the slide, been assigned successively to the species *Chelanops morosus* Banks and *Chelanops sanborni* (Hagen). The specimen appears to be more closely related to *Hesperochernes sanborni* as redescribed by Hoff (1946*a*) than to *Dendrochernes morosus* as also redescribed by Hoff (1947), but belongs to neither of these species. The present specimen appears not to have been reported by Ewing (1911) under either *Chelanops morosus* or *sanborni,* since the only specimens collected at Arcola and assigned by Ewing to the genus *Chelanops* were listed as *Chelanops pallidus.* It is possible that this specimen was not included in the report made by Ewing in 1911.

Female.—Body and appendages fairly stout; abdomen, carapace, and legs brown; palps deeper golden brown; length of body about 2 mm. Carapace rounded anteriorly and laterally; surface coarsely granulate; anterior margin with 4 and the posterior margin with 8 to 10 setae; all carapacic setae distinctly clavate; greatest width near the center of the carapace, slightly narrower behind; length of carapace 0.65 mm., greatest width 0.66 mm. (or a little less, as the carapace may be somewhat flattened from mounting); posterior width 0.64 mm. Tergites a little deeper brown than the carapace; interscutal areas subpapillose and not pigmented; each tergal half with five to eight distinctly clavate setae. Sternites almost smooth, brown in color, all except the tenth divided and with scuta well separated; tergite 4 with nine setae; maximum number of setae on any sternal half is 10; all sternal setae acuminate. Pleural membranes with wavy, almost papillose, striations; each anterior stigmatic plate with three setae, each posterior plate with two.

Chelicera.—Yellow in color; fairly stout; palm of hand with netlike markings; longest flagellar seta serrate along almost the entire anterior edge. Fixed finger with two or three weak and rounded denticles on the inner margin of the apical tooth and two strong and one or two very weak denticles on the inner finger margin near the distal end; lamina exterior evenly convex. Movable finger stout, fig. 36*E*; subapical lobe located near the base of the apical tooth; galeal seta not reaching to the tip of the galea; galea fairly stout and straight, with apparently six simple rami in the distal half; serrula exterior of 17 ligulate plates; movable finger about 0.16 mm. in length.

Palp.—Fig. 36*C*. Maxilla with numerous acuminate setae and with all except the ventral face moderately granulate; the trochanter, femur, and tibia weakly to moderately granular and with numerous clavate setae, the setae ranging from strongly clavate on the trochanter and femur to weakly clavate on the extensor surface of the tibia; chela weakly granulate on the flexor surface, setae more clavate on the flexor than on the extensor surface; fingers almost smooth and with numerous acuminate setae. Maxilla 0.34 mm. long, 0.24 mm. wide. Trochanter with very globose protuberances, little elevated; pedicle almost as long as wide; 0.34 mm. long, 0.205 mm. wide. Femur with pedicle well separated from the rest of the segment and a little wider than long; flexor margin weakly convex except on the distal one-third; extensor margin a little convex; 0.48 mm. long, 0.21 mm. wide. Tibia with a stout pedicle; flexor margin bulging in the center but flattened beyond; extensor margin flatly convex in the central portion; setae much less clavate on the extensor than on the flexor surface; 0.48 mm. long, 0.22 mm. wide. Chela with pedicle near center of base; extensor margin flatly convex, flexor margin much more convex; fingers slender and gently curved; chela, without pedicle, 0.85 mm. long, 0.31 mm. wide; hand, without pedicle, 0.415 mm. long, 0.3 mm. deep; movable finger 0.455 mm. long. Viewed laterally, fig. 36*A*, chelal hand fairly stout, pedicle displaced a little toward the ventral side; ventral margin little convex, dorsal margin more convex; basal margin rounded; the fixed finger nearly straight, the movable finger a little curved. Tactile seta as shown in the figure. Fixed chelal finger with a reduced venedens, fig. 36*B*, and a short vestigial venom duct; nodus ramosus of movable finger between one and two areolar diameters basad from tactile seta *t*; marginal teeth of both fingers contiguous and cusp-bearing, between 30 and 35 in number; three or four internal

ıd the same number of external accessory eth on each finger.

Legs.—Setae of legs variable; those of the tensor surface of segments chiefly clavate, hers subclavate to acuminate; segments parently smooth. First leg with pars salis 0.122 mm. deep; pars tibialis with th margins evenly convex, 0.113 mm. deep; tire femur with most setae subclavate to avate, 0.34 mm. long; tibia stout and very eakly S-shaped, 0.247 mm. long, 0.087 mm. ep; tarsus with setae of extensor surface uminate, extensor margin nearly straight, xor margin very weakly convex, deepest the basal third and tapering a little to- ard the distal end, 0.27 mm. long, 0.065 m. deep. Fourth leg with setae of the ochanter, the pars basalis, and the flexor rface of the tarsus acuminate; setae of the tensor surface of the tibia and tarsus rongly clavate; setae of the flexor surface the pars tibialis and tibia weakly clavate acuminate; pars basalis 0.145 mm. deep; tire femur with the flexor margin evenly d weakly convex, the extensor margin ell rounded and evenly convex, margins the two femoral parts continuous; entire mur 0.46 mm. long, 0.155 mm. deep; tibia uch more slender than that of the first and a little S-shaped, 0.365 mm. long, 095 mm. deep; tarsus narrowing gradu- y toward the distal end, 0.305 mm. long, 07 mm. deep; a subtactile clavate seta nger than the other investing setae located ward the distal end of the extensor margin the tarsus.

Genital Complex.—Posterior margin with setae forming a single row; anterior erculum with about 20 setae irregularly ranged in a group anteriad to the genital erture.

MALE.—The single known male, the allo- pe, not in a favorable condition or position r study, having been mounted in an un- sected condition by Ewing. As near as n be determined, structural details are ntical in the two sexes except that the ela is a little stouter and the tactile seta of the movable chelal finger is relatively oser to *t* and farther from *sb* in the male. easurements secured from the male as lows: carapace 0.65 mm. long, 0.67 mm. de; palpal trochanter 0.34 mm. long and 05 mm. wide; femur 0.49 mm. long, 0.21 n. wide; tibia 0.48 mm. long, 0.215 mm. de; chela exclusive of pedicle 0.85 mm. g and 0.32 mm. wide; chelal hand ex-

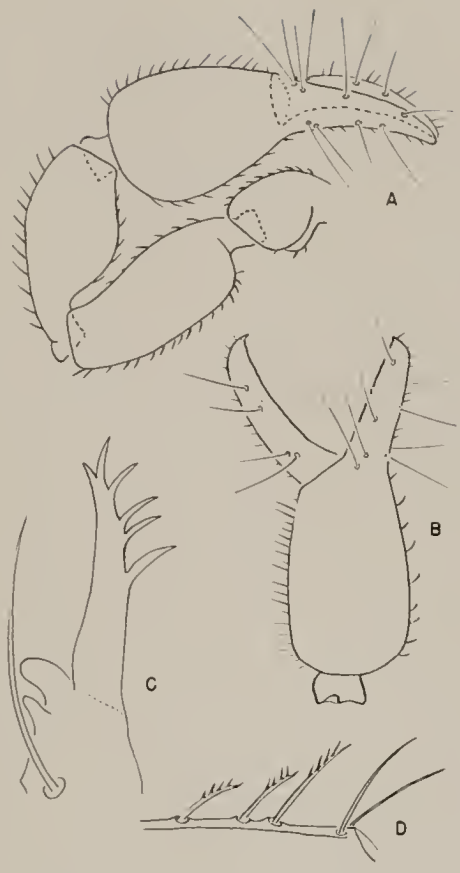


Fig. 37.—*Reginachernes lymphatus. A*, dorsal view of palp, holotype ♀; *B*, lateral view of chelal hand, allotype ♂; *C*, tip of movable cheliceral finger, holotype ♀; *D*, apical setae of extensor surface of tarsus IV, holotype ♀.

clusive of pedicle about 0.4 mm. long, movable finger 0.46 mm. long. Fourth leg with entire femur 0.46 mm. long, 0.15 mm. deep; tibia 0.36 mm. long, 0.09 mm. deep; tarsus 0.31 mm. long and 0.07 mm. deep. Details of genital complex not discernible in specimen.

Holotype, female.—Muncie, Illinois, Sept. 19, 1943, H. H. Ross.

Allotype, male.—Arcola, Illinois, July 21, 1909, H. E. Ewing (MCZ).

The holotype was collected from leaf mold and the allotype was secured from beneath the bark of an oak tree.

Reginachernes lymphatus new species

Reginachernes lymphatus, figs. 37*A*–37*D*, may be separated from *ewingi* by characters

given in the key. The palp of *lymphatus* has considerable similarity to the palp of *Chelanops corticis* Ewing, as figured by Ewing (1911, fig. 9). Our form, however, differs in many ways from the text description given by Ewing with respect to the cheliceral galea, the investing setae of the palps, and other details. There is a possibility that some of these characters may have been misinterpreted, in which case *lymphatus* may really be *corticis*. To date the type material of *corticis* has not been located; so its identity cannot be established.

FEMALE.—Observations and measurements are based upon the female holotype and one female paratype unless otherwise indicated. Body and legs light brown, palps golden brown; body stout; length of body (four females measured) between 2.4 and 2.6 mm., the holotype with the abdomen contracted measuring only 1.95 mm. Carapace stout; anterior half with rounded margins, posterior portion with sides almost parallel; surface moderately to coarsely granular, appearing more weakly granular on the dorsal surface; setae scattered, fairly numerous, distinctly clavate; posterior transverse furrow much closer to the posterior carapacic margin than to the median furrow; posterior carapacic margin with 10 to 12 clavate setae; eye spots not observed; length of carapace about 0.85 mm., greatest width about 0.75 mm. Tergites of abdomen brown in color, all divided except the eleventh, with the interscutal membranes very rugose; tergites fairly granular; setae clavate, usually seven setae on each scutum of first tergite and eight setae on each scutum of the second tergite, maximum number of setae on any tergal half is 11. Sternites 4 through 10 divided; interscutal spaces striate and rugose; sternal scuta brown in color, marked by scalelike lines; each half-sternite of the fourth abdominal segment with four to six acuminate setae; maximum number of setae on any sternal half is 17. Pleural membranes very rugose; each anterior stigmatic plate with two setae, posterior plate with one; abdomen stout, usually about 1.5 mm. long, about 1 mm. wide.

Chelicera.—Fairly stout; palm of hand with netlike markings; subbasal seta with a few minute terminal and subterminal denticulations; longest flagellar seta unilaterally serrate, the serrations minute and widely spaced; length of chelicera 0.22–0.24 mm., width of base 0.13 mm. Fixed finger slender; lamina exterior well developed and evenly convex; inner margin of apical tooth with three small denticles, inner margin of finger with two strong and two weak denticles near the distal end. Movable finger, fig. 37*C*, fairly stout; subapical lobe inserted near the base of the apical tooth and much distad from the insertion of the galeal seta; one or two minute denticles on the inner finger margin near the level of the insertion of the galeal seta; galeal seta not reaching to the tip of the galea; galea fairly stout, with six simple and distally acute rami confined to the distal one-half of the galea; serrula exterior of 17 or 18 ligulate plates; length of movable cheliceral finger about 0.19 mm.

Palp.—Fig. 37*A*. Measurements and ratios of the palpal femur, tibia, and chela (except the depth) given as the range of four individuals (the holotype and three female paratypes), of which two are in alcohol. Stout, fairly deep brown to reddish or golden brown in color; the sides of the maxilla and the entire trochanter and femur moderately to coarsely granular; the flexor surface of the tibia moderately granular; the flexor surface of the chelal hand weakly to moderately granular; setae of the trochanter and the flexor surfaces of the femur and tibia heavy and chiefly clavate; setae of the extensor surface of the femur and tibia less strongly clavate and sometimes paucidenticulate; setae of the flexor surface of the chelal hand subclavate, those of the extensor surface paucidenticulate; setae of the fingers acuminate. Maxilla about 0.4 mm. long and 0.3 wide. Trochanter in strict dorsal view very stout; subdorsal protuberance rounded and not much elevated; trochanter of female paratype 0.42 mm. long, 0.24 mm. wide. Femur with pedicle little longer than wide; extensor margin of femur very flatly convex, flexor margin weakly convex in the basal two-thirds but weakly concave beyond; measured along the extensor margin 0.63–0.64 mm. long, 0.255–0.27 mm. wide, length 2.35 to 2.5 times the width. Tibia with extensor margin slightly flattened in the central portion; flexor margin bulging and convex except at the extreme distal end where the margin is flattened or very slightly concave; 0.6–0.63 mm. long, 0.28–0.29 mm. wide, length between 2.1 and 2.2 times the width. Chela with margins evenly convex, the flexor margin a little more convex than the extensor; base of hand

rounded; fingers fairly slender and somewhat curved; chela, without pedicle, 0.99–1.02 mm. long, 0.37–0.38 mm. wide, length between 2.65 and 2.75 times the width; chelal hand exclusive of pedicle 0.52–0.55 mm. long, about 0.33 mm. deep (depth determined for the hand of only one female); movable finger 0.5–0.53 mm. long. Viewed laterally, the base of the chelal hand appears rounded, the margins weakly convex, and the pedicle displaced a little toward the ventral side; the fixed finger nearly straight, the movable finger a little curved and appearing weakly granulate on the exterior surface. Tactile setae of chelal fingers as shown for the male, fig. 37*B*; nodus ramosus of movable chelal finger varying from a position about midway between tactile setae *t* and *st* to a position much closer to *st* than to *t*. Each finger with about 40 contiguous, conical, cusp-bearing marginal teeth; accessory teeth somewhat variable, usually 8 to 10 in the external row of each finger and 1 to 4 in the internal row; end of fixed finger with a very poorly developed venedens containing a vestigial duct.

Legs.—Measurements relative to the holotype are followed in parentheses by the corresponding measurements of the mounted female paratype whenever the two show a significant difference. Legs usually light brown in color; femoral parts and tibiae weakly granular, granules not easily observed except on the pars tibialis; setae of the extensor surface of the segments and in part setae of flexor surfaces of femora subclavate to paucidenticulate; setae of the flexor surfaces of the tibia and tarsus acuminate and more numerous. First leg with pars basalis 0.152 (0.16) mm. deep; pars tibialis 0.14 mm. deep; entire femur 0.44 mm. long, length 2.88 (2.75) times the depth; tibia stout, deepest near the distal one-third, 0.3 (0.315) mm. long, 0.102 mm. deep; tarsus tapering a little toward the distal end, subcylindrical, about 0.295 mm. long, 0.065 (0.068) mm. deep. Fourth leg with pars basalis 0.182 (0.175) mm. deep; pars tibialis 0.205 (0.192) mm. deep; femur with extensor margin evenly convex, flexor margin very weakly convex to straight, length of entire femur 0.595 (0.61) mm., length 2.9 (3.17) times the depth; tibia much more slender than in the first leg, flexor margin a little convex, extensor margin straight to a very little concave; tibia 0.46 (0.48) mm. long, 0.12 (0.114) mm. deep; tarsus subcylindrical but tapering a little toward the distal end, 0.34 (0.35) mm. long, 0.084 mm. deep; the extensor margin of the tarsus with a denticulate pseudotactile seta, fig. 37*D*, longer than the denticulate investing setae and located 0.2–0.22 mm. from the proximal margin of the tarsus.

Genital Complex.—About 12 to 15 marginal setae on the posterior operculum; nearly 20 setae grouped anteriad to the aperture on the anterior operculum.

MALE.—Unless otherwise indicated, description and measurements are based upon the male allotype. Body and carapace much as in the female; a few more setae on the fourth sternal halves and a few less on the central sternal halves than in the female; body of allotype 2.4 mm. long, of one paratype 2.15 mm. long; carapace and abdomen as in the female.

Chelicera.—As in the female.

Palp.—Chaetotaxy and sculpturing, as well as the general appearance, much as in the opposite sex except setae may be a little heavier and the palpal femur and chela appear to be a very little stouter. Measurements based on two individuals (one in alcohol), the measurements of the male allotype followed in each instance by the corresponding measurement of the male paratype, whenever a measurement was secured for the latter. Maxilla 0.38 mm. long, about 0.3 mm. wide; trochanter 0.43 mm. long, 0.25 mm. wide; femur measured along the extensor margin 0.64 (0.6) mm. long, 0.27 (0.255) mm. wide; tibia 0.63 (0.6) mm. long, 0.295 (0.285) mm. wide; chela exclusive of pedicle 1.06 (0.97) mm. long, 0.407 (0.38) mm. wide; chelal hand exclusive of pedicle 0.55 (0.51) mm. long, 0.355 mm. deep; movable finger 0.545 (0.51) mm. long. Tactile setae, fig. 37*B*, and teeth of the chelal fingers much as in the female.

Legs.—Essentially as in the female; measurements secured only from the allotype. First leg with pars basalis 0.15 mm. deep, pars tibialis 0.14 mm. deep; entire femur 0.44 mm. long; tibia 0.308 mm. long, 0.103 mm. deep; tarsus 0.285 mm. long, 0.065 mm. deep. Fourth leg with pars basalis 0.164 mm. deep, pars tibialis 0.183 mm. deep; entire femur 0.595 mm. long; tibia 0.465 mm. long, 0.118 mm. deep; tarsus 0.345 mm. long, 0.084 mm. deep; denticulate pseudotactile seta located 0.225 mm. from proximal margin of tarsus.

Genital Complex.—Posterior operculum

with 24 scattered setae, some of which are arranged along the posterior margin, and four smaller setae just posteriad to the posterior rim of the aperture; anterior operculum with 24 scattered setae.

Tritonymph.—Unless indicated to the contrary, description is based on one tritonymph paratype. Lighter in color, smaller in size, and with stouter segments than in the adult. Chaetotaxy of the abdomen and carapace much as in the adult but with a slightly smaller number of setae; body about 2 mm. long.

Chelicera.—Much as in the adult except smaller; the denticulations of the subbasal seta almost wanting; galea more slender and the rami confined to about the distal one-third; serrula exterior of 15 or 16 ligulate plates.

Palp.—Chaetotaxy and sculpturing much as in the female, except the setae a little less stout, color lighter; the palpal femur a little stouter but the chela more slender than in the adult. Measurements of the femur, tibia, chela, and movable finger are the ranges secured from measuring three individuals, of which two are unmounted. Femur 0.4–0.41 mm. long, 0.195–0.2 mm. wide; tibia 0.395–0.4 mm. long, 0.205–0.21 mm. wide; chela exclusive of pedicle 0.7–0.73 mm. long, 0.25–0.255 mm. wide; movable finger 0.37–0.39 mm. long; chelal hand exclusive of pedicle in the mounted paratype 0.37 mm. long, 0.35 mm. deep. Movable finger with three tactile setae: *t* a little more than one-third of the finger length from the tip; *b* placed much as in the adult; *st* midway between *t* and *b*; *sb* wanting; nodus ramosus about one areolar diameter proximad from the level of tactile seta *t*. Fixed finger with tactile setae much as in the adult except *ist* is wanting and *it* is relatively a little farther from the level of *et*. Each finger with between 25 and 30 marginal teeth; each external row of accessory teeth with three to five teeth, internal row represented by one or two teeth; fixed finger with weakly developed venedens and vestigial duct.

Legs.—Lighter in color, less sclerotic, and with fewer setae than in the adult; segments stouter; tarsi more narrowed distally; fourth tarsus with the denticulate pseudotactile seta as described for the adult. Measurements not secured.

Deutonymph.—Description based on one individual. Smaller, lighter in color, and with appendages stouter than in the tritonymph; most tergal scuta with five or six clavate setae; anterior stigmatic plate appears to have but one seta; length of body about 1.4 mm.

Chelicera.—Smaller than in the tritonymph; subbasal seta simple; galea with probably three rami, terminal and subterminal in position.

Palp.—Segments much smaller, lighter in color, and with fewer and slightly weaker setae than in the tritonymph; general shape very similar in the tritonymph and the deutonymph. Measurements of one deutonymph follow: femur 0.28 mm. long, 0.145 mm. wide; tibia 0.28 mm. long, 0.15 mm. wide; chela exclusive of pedicle 0.53 mm. long, 0.185 mm. wide; chelal hand exclusive of pedicle 0.275 mm. long, 0.175 mm. deep; movable finger 0.27 mm. long. Viewed laterally, dorsal margin of chelal hand appears much more convex than the ventral margin. Movable finger with two tactile setae; one probably *st*, a little distad from the midpoint of the finger and about one areolar diameter proximad from the level of the nodus ramosus; *b* as in the tritonymph. Setae of the fixed finger considerably different from those of the tritonymph; *it* near the mid-point of the finger or a little proximad from the mid-point; *et* about midway between the finger tip and *it*; *est* about as far from the finger base as *et* is from the finger tip; *ib* a little proximad from the level of *isb*; *esb* apparently wanting; *eb* basad from the level of *ib*. Marginal teeth of the chelal fingers much as in the tritonymph except cusps less well developed; accessory teeth wanting except for a single internal accessory tooth near tip of fixed finger.

Legs.—Much like the legs of the tritonymph except less sclerotic, much smaller, and with many segments probably a little stouter. Pseudotactile seta of the fourth pedal tarsus denticulate in the mounted deutonymph.

Holotype, female.—Urbana, Illinois: Brownfield Woods, Oct. 21, 1933, H. H. Ross.

Allotype, male.—Mooseheart, Kane County, Illinois: Sept. 24, 1940, Henry Dybas (CM).

Paratypes.—Illinois. Aurora: Sept. 4, 1939, Henry Dybas, 4 tritonymphs, 2 deutonymphs (CM); April, 1940, 1 ♂, 1 ♀, 2 tritonymphs (CM). Mooseheart: same data as for allotype, 2 ♀ (CM).

The holotype was taken from soil-cover mples in oak-hickory woods.

17. *PSEUDOZAONA* Beier

eudozaona Beier (1932*c*, p. 182; 1933, p. 542). Genotype, by original designation, also nonobasic: *Pseudozaona communis* Beier.
eudozaona Beier. Hoff (1947, p. 539).

Carapace longer than wide, with two nsverse furrows. Setae of body and palps ithed, usually subclavate to clavate. agellum with four setae. Palps slender, s. 38*A*, 38*C*, the pedicle of the femur not ll set off from the rest of the segment. ie tactile seta *ist* placed distad from *est* the fixed chelal finger; *st* between *t* and or a little closer to *t* than to *sb* on the vable chelal finger. Legs moderately nder; tarsus of fourth leg without a tac- e seta.

This genus, which has not been reported om Illinois, can be recognized by charac- istics given in the key. It contains the notype, *communis*, from Mexico; *uni- mis* (Banks), from Costa Rica; and *rabilis* (Banks), from the eastern United ates, where it has been taken from caves Kentucky and Virginia. Diagnostic characters are illustrated in figs. 38*A–C*; a more nearly complete description has been given previously by the writer (Hoff 1946*f*).

18. *DINOCHEIRUS* Chamberlin

Dinocheirus Chamberlin (1929*a*, p. 171). Genotype, monobasic: *Dinocheirus tenoch* Chamberlin.
Dinocheirus Chamberlin. Chamberlin (1934, p. 126), Hoff (1947, p. 513).

DIAGNOSIS.—Carapace with two well-developed transverse furrows; usually no eye spots. Cheliceral hand with five setae, the basal seta acuminate, the subbasal seta subterminally denticulate; galea of male commonly less branched than the galea of the female; flagellum of chelicera with four setae. Palps moderately stout; chela of male usually stouter and larger than that of the female; well-developed accessory teeth present on the chelal fingers; nodus ramosus of movable finger between *t* and *st*; *st* closer to *t* than to *sb* and *t* closer to *st* than to the finger tip; *ist* commonly a little distad from *est*, fig. 39*B*. Tarsus of fourth leg with an acuminate or pseudotactile acuminate seta located distad from the mid-point of the extensor surface and longer than the

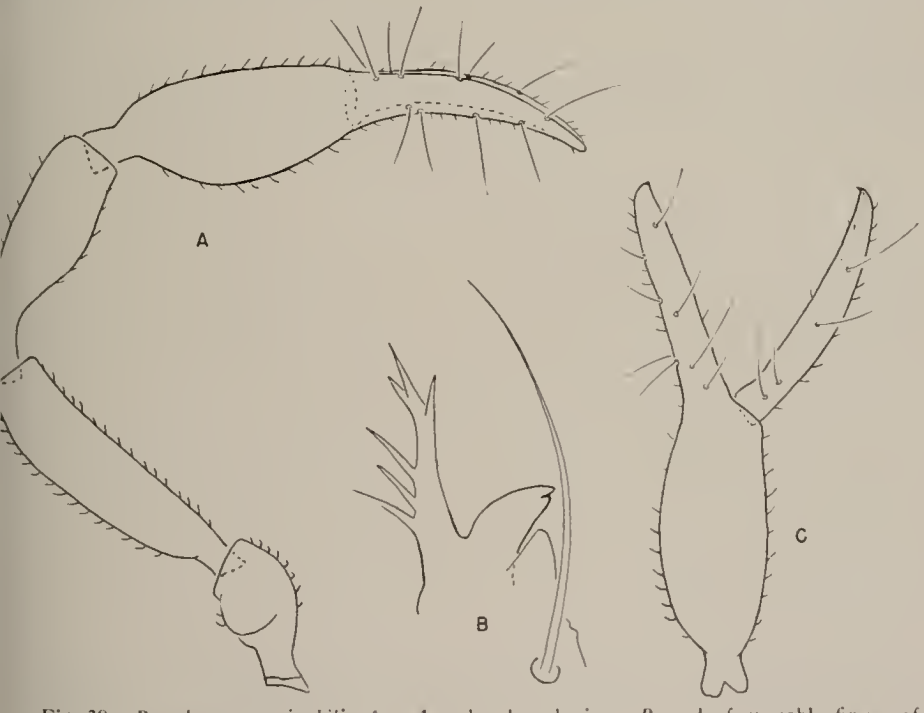


Fig. 38.—*Pseudozaona mirabilis* ♂. *A*, palp, dorsal view. *B*, end of movable finger of elicera; *C*, chela, lateral view (teeth omitted).

depth of the tarsus. Seminal receptacle of the female paired, very elongate, tubular, with a terminal ovate sac.

Two species have been collected in Illinois. Several others are known from the Atlantic states and from the West and Southwest.

KEY TO SPECIES

Palpal femur with length more than 0.6 mm. and more than 2.5 times the width..... .....**pallidus**

Palpal femur with length less than 0.6 mm. and less than 2.5 times the width.....**solus**

Dinocheirus pallidus (Banks) new combination

Chernes pallidus Banks (1890, p. 152).
Hesperochernes pallidus (Banks). Hoff (1947, p. 509).

Ewing (1911) listed *Chelanops pallidus* from Arcola and from Marshall, Illinois. A study of some of the specimens assigned by Ewing to this species indicates an incorrect determination, which is also evident when his figure (Ewing 1911, fig. 11) is compared with the lectotype of *pallidus* at the Museum of Comparative Zoology. Ewing's available specimens of *pallidus* are really *Parachernes squarrosus* new species, as noted under this latter species.

Diagnostic characters for *pallidus* are given in fig. 39. The male has not been described previously. Three specimens of this sex were taken in an Arkansas collection along with a female that agrees closely with the lectotype at the Museum of Comparative Zoology.

MALE.—Description and measurements based on four males, one from Illinois and three from Arkansas. Body fairly stout, yellowish to light brown in color; palps reddish-brown; body length 2.55–2.75 mm. Carapace granular; setae clavate and fairly numerous; anterior half of carapace rounded, posterior portion of sides subparallel; posterior margin with 12 to 15 irregularly placed marginal setae; no eye spots; carapace 0.88–0.96 mm. long, 0.6–0.8 mm. wide near the center; posterior width a little less than the greatest width. Tergites of abdomen except the eleventh divided but first tergite sometimes very weakly divided; setae clavate; each first tergal scutum with 9 or 10 setae, central tergal halves with as many as 14 setae; tergal scuta moderately granular. Sternites 4 through 10 divided, marked by scalelike markings; each half-sternite 4 with four setae; maximum number of setae on any sternal half about 12, usually somewhat less; setae acuminate to subacuminate and paucidenticulate. Pleural membranes with fine wavy striations; each stigmatic plate with one or two (rarely three) setae, somewhat variable; abdomen 1.65–1.8 mm. long, about two-thirds as wide as long.

Chelicera.—Fairly stout, deep yellow in color; palm of hand with a few netlike markings; subbasal seta denticulate, basal seta acuminate; length of chelicera 0.24–0.25 mm., width of base 0.135–0.165 mm., movable finger 0.2–0.23 mm. long. Fixed finger slender; two or three small denticles on the inner margin of the apical tooth and four or five denticles on the inner margin of the finger near the distal end. Movable finger, fig. 39*C*, little curved; apical tooth often weakly bicuspid; subapical lobe weakly bicuspid or tricuspid, often a weak denticle on the finger margin near the insertion of the galeal seta; gelea slender and with five or six acutely pointed, short rami confined to the distal one-third; galeal seta not reaching to the level of the tip of the galea; serrula exterior of 17 or 18 ligulate plates.

Palp.—Fig. 39*A*. Moderately stout; granular except the face of the maxilla, the extensor surface of the tibia and the chelal hand, and the fingers; setae of maxilla acuminate; setae of the trochanter and femur subclavate and multidenticulate, those of the tibia multidenticulate but somewhat slender and especially on the extensor surface not subclavate; setae of the chelal hand weakly multidenticulate to paucidenticulate, those of the fingers acuminate. Maxilla 0.45–0.53 mm. long, 0.27–0.32 mm. wide. Trochanter with a stout subdorsal protuberance; length 0.38–0.45 mm., 1.4 to 1.6 times the width. Femur with pedicle about as long as wide; extensor surface of femur weakly and somewhat flatly convex; flexor surface weakly convex except a little concave near the distal end; 0.77–0.88 mm. long, 0.27–0.31 mm. wide; length 2.75 to 3.25 times the width. Tibia with extensor margin somewhat flatly convex; flexor margin convex near the center but somewhat concave beyond; 0.76–0.8 mm. long, 0.29–0.34 mm. wide; length 2.45 to 2.65 times the width. Chela as viewed from the dorsum with the extensor, flexor, and basal margins more or less evenly convex; in general the chelal hand is elongate-oval, tapering somewhat toward the base of the fingers, and widest in the basal half; chelal fingers

slender, gently and evenly curved; chela exclusive of pedicle 1.22–1.36 mm. long, 0.43–0.52 mm. wide, length 2.6 to 3.0 times the width; chelal hand exclusive of pedicle

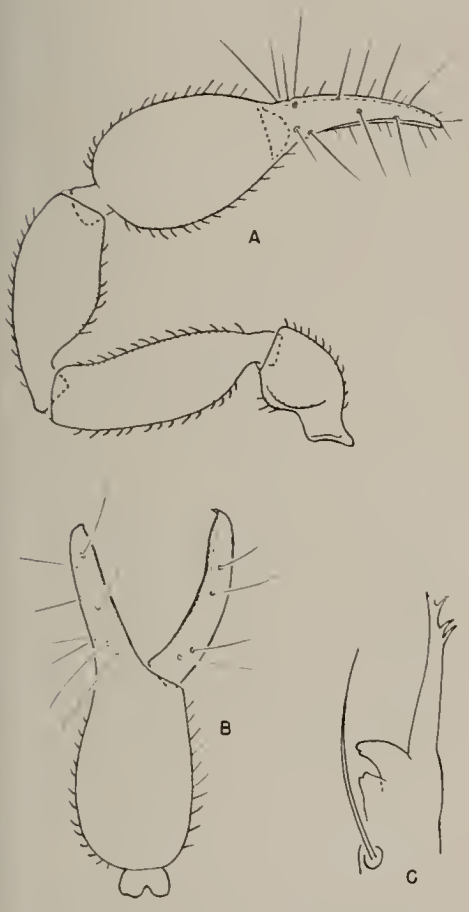


Fig. 39.—*Dinocheirus pallidus* ♂. *A*, dorsal view of palp; *B*, lateral view of chela; *C*, end of movable cheliceral finger.

0.64–0.69 mm. long, 0.4–0.52 mm. deep, usually 4.5 mm. or less; movable finger between 0.63 and 0.72 mm. long, usually 0.7 mm. or more. Viewed laterally, fig. 39*B*, chelal hand fairly stout, extensor and flexor margins moderately convex but hand tapering little toward base of fingers; basal margin flatly convex, with the pedicle displaced somewhat toward the ventral side; movable finger markedly convex, especially near the center; fixed finger variable, either nearly straight or with the inner margin convex and the outer margin distinctly concave; fingers gapping when closed. Tactile setae as shown in the figure. Fixed finger with a vestigial venedens and a short nonfunctional venom duct. Marginal teeth of chelal fingers contiguous and cuspid, between 35 and 45 on each finger; each finger usually with two (occasionally only one) to four internal and six to eight external accessory teeth. Nodus ramosus of movable chelal finger located between tactile seta *t* and *st*, usually much closer to the latter than to the former.

Legs.—Legs slender; setae multidenticulate to paucidenticulate on the extensor surface of segments, paucidenticulate on the flexor surface of segments except acuminate on the flexor surface of the tarsi; femora and tibiae weakly granular or sculptured by netlike markings. First leg with trochanter 0.16–0.18 mm. long, length 1.1 to 1.13 times the width; pars basalis 0.16–0.18 mm. deep; pars tibialis 0.145–0.16 mm. deep, with both margins very weakly convex; entire femur 0.56–0.65 mm. long, length 3.1 to 3.6 times the depth; tibia slender, flexor margin weakly convex, 0.41–0.49 mm. long, 0.1–0.11 mm. deep, length 3.9 to 4.5 times the depth, length usually 4.3 or more times the depth; tarsus very slender, subcylindrical, tapering a little toward the distal end, 0.4–0.45 mm. long, 0.065–0.075 mm. deep, length 5.7 to 6.4 times the depth. Fourth leg with pars basalis 0.2–0.21 mm. deep; pars tibialis 0.23–0.24 mm. deep; entire femur with evenly convex extensor margin, flexor margin virtually straight except at the ends, 0.72–0.82 mm. long, length 3.0 to 3.4 times the depth; tibia with weakly convex flexor margin, extensor margin nearly straight except at the basal end, 0.6–0.7 mm. long, 0.13–0.145 mm. deep, length 4.5 to 4.9 times the depth; tarsus tapering a little toward the distal end, 0.45–0.50 mm. long, 0.08–0.09 mm. deep, length 5.35 to 5.75 times the depth; short tactile seta on the extensor surface 0.32–0.37 mm. from the proximal end of the tarsus.

Genital Complex.—Posterior operculum with about 25 setae, many of which form an irregular marginal row, and with 6 to 8 setae along the very posterior rim of the aperture; anterior operculum very setaceous, with between 50 and 60 setae more or less scattered over the face of the operculum.

FEMALE.—The two available females, one from Illinois and one from Arkansas, are

essentially like the male and also very similar in detail to the female lectotype previously described (Hoff 1947). Some of the minor discrepancies noticed between the present females and the lectotype can be attributed to the poorly preserved and somewhat broken condition of the lectotype. None of the differences are of sufficient value to justify even subspecific segregation. Measurements are given to show some of the species variations that occur. The measurement of the single available female from Illinois is followed in each instance by the corresponding measurement of the female from Arkansas. Female length 3.35 (2.98) mm.; carapace 1.1 (1.01) mm. long, 0.83 (0.675) mm. wide; abdomen about 2.3 (1.86) mm. long, 1.8 (1.25) mm. wide; chelicera 0.26 (0.255) mm. long, 0.155 (0.145) mm. wide across the base, movable finger 0.21 (0.21) mm. long. Palp with maxilla 0.51 (0.51) mm. long, 0.35 (0.34) mm. wide; trochanter 0.51 (0.48) mm. long, 0.3 (0.32) mm. wide; femur measured along the extensor margin 0.88 (0.88) mm. long, greatest over-all length 0.94 (0.95) mm., width 0.305 (0.29) mm.; tibia 0.84 (0.785) mm. long, 0.335 (0.315) mm. wide; chela exclusive of pedicle 1.44 (1.44) mm. long, 0.52 (0.495) mm. wide; chelal hand exclusive of pedicle 0.75 (0.735) mm. long, 0.53 (0.485) mm. deep; movable finger 0.78 (0.77) mm. long. First leg with pars basalis 0.182 (0.178) mm. deep; pars tibialis 0.155 (0.152) mm. deep; entire femur 0.65 (0.625) mm. long; tibia 0.48 (0.465) mm. long, 0.106 (0.103) mm. deep; tarsus 0.45 (0.46) mm. long, 0.068 (0.076) mm. deep. Fourth leg with pars basalis 0.228 (0.225) mm. deep; pars tibialis 0.25 (0.246) mm. deep; entire femur 0.85 (0.83) mm. long; tibia 0.68 (0.69) mm. long, 0.136 (0.133) mm. deep; tarsus 0.49 (0.495) mm. long, 0.091 (0.092) mm. deep; tactile seta 0.34 (0.38) mm. from the proximal margin of the tarsus.

Tritonymph.—Very similar in most ways to the adult but lighter in color, much smaller in size, and with some segments, especially those of the legs, stouter. Movable chelal finger with three tactile setae: *b* (or *sb*?) wanting; *t* a little distad from the mid-point of the finger; *st* about as far from the finger base as *t* is from the tip; *sb* (or *b*?) as in the adult; nodus ramosus a little proximad from the level of tactile seta *t*. Fixed finger with tactile setae much as in the adult except *ist* is wanting. Important measurements of the tritonymph are given here. Body about 2.45 mm. long carapace 0.78 mm. long, 0.58 mm. wide Chelicera 0.22 mm. long, 0.13 wide; movable finger 0.175 mm. long. Palp with the trochanter 0.32 mm. long, 0.21 mm. wide femur 0.59 mm. long, 0.225 mm. wide tibia 0.55 mm. long, 0.25 mm. wide; chela exclusive of pedicle 1.03 mm. long, 0.345 mm. wide; chelal hand exclusive of pedicle 0.53 mm. long, 0.35 mm. deep; movable finger 0.54 mm. long. First leg with entire femur 0.43 mm. long, depth across pars basalis 0.152 mm.; tibia 0.308 mm. long 0.087 mm. deep; tarsus 0.34 mm. long, 0.065 mm. deep. Fourth leg with entire femur 0.61 mm. long, 0.192 mm. deep across the pars tibialis; tibia 0.48 mm. long, 0.114 mm deep; tarsus 0.38 mm. long, 0.084 mm. deep

Distribution.—This species, originally described from Ithaca, New York, has been taken in two collections from northern Illinois. In addition, three males, one female and one tritonymph were secured by M. W. Sanderson on April 13, 1940, at Lake Wedington Wildlife Area, Washington County, Arkansas.

The Illinois collection from Magnolia came from a decayed log, and the Arkansas specimens were taken from debris in a hollow tree on a wooded hillside.

Illinois Records.—A single male was taken in a collection made by Henry Dybas at Palos Park, Cook County, Illinois, on May 16, 1943, and a single female was taken at Magnolia, Putnam County, Illinois on March 23, 1944, by H. H. Ross.

Dinocheirus solus new species

Specimens of *Dinocheirus solus,* figs. 40*A*, 40*B*, differ from those of many species of the genus *Dinocheirus* by their much smaller size. This new species appears to be closely related by size and general structure to *dorsalis* (Banks), from which it is readily separated by small differences in the shape of some of the palpal segments, the length and position of the tactile seta of the fourth pedal tarsus, and numerous other details.

Male.—Body ovate, fairly stout; yellow to yellowish-brown in color, with the palp a deeper golden brown; length of body 2.5 mm. Carapace rounded anteriorly, sides convex; widest across the center; furrows well marked; eyes apparently wanting; posterior carapacic margin with 12 setae; al

ie of carapace weakly to strongly clavate; s of carapace moderately granular, dor- face virtually smooth; length of carapace 3 mm., greatest width 0.7 mm., posterior th 0.66 mm. Tergites of abdomen weakly nular and with scalelike markings, all ided except the last; intertergal spaces le; setae of tergites clavate and with as ny as 12 setae on some of the central gal halves. Sternites 4 to 10 inclusive ided; fourth sternal halves each with r or five setae, central sternal halves each h 11 or 12 setae; all setae of sternites minate; sternites with scalelike sculptur- ; pleural membranes striated and rugose; lomen about 1.35 mm. long, 1.12 mm. le.

Chelicera.—Base fairly stout, fingers rela- ly slender and slightly curved; subbasal subterminally denticulate, basal seta minate; length of chelicera 0.2 mm., lth of base 0.125 mm. Fixed finger a le curved, with five or six weakly de- oped teeth on the distal inner margin in lition to three denticles on the inner sur- e of the apical tooth. Movable finger rly straight; subapical lobe not especially ll developed; apical tooth terminally rotic and bicuspid; galea slender and g, with five weakly developed and short minal and subterminal rami; serrula erior of 17 to 18 plates; movable finger 75 mm. long.

Palp.—Fig. 40*A*. Fairly stout; the lateral face of the maxilla, the extensor surface the trochanter, and the flexor surfaces the femur and tibia coarsely to moder- ly granular; other surfaces very weakly nulate to smooth; setae acuminate on maxilla; setae of the trochanter, femur, l tibia somewhat stout and multidenticu- e to paucidenticulate; setae stouter on femur and the trochanter than else- ere; chelal hand with setae chiefly pauci- nticulate; acuminate setae on the fingers. axilla 0.37 mm. long, 0.27 mm. wide. ochanter with the flexor, or inner margin, derately convex; 0.32 long, 0.21 mm. le. Femur moderately stout to stout, 6 mm. long, 0.235 mm. wide; outer mar- convex, more convex near the ends than the center; inner margin weakly convex the basal two-thirds but a little concave the distal one-third; the pedicle about as g as wide, well set off from the rest of segment. Tibia with outer margin flatly nded, inner margin bulging, but slightly concave distad from the center; pedicle stout; 0.56 mm. long, 0.245 mm. wide. Chela with outer and inner margins more or less evenly convex, the outer a little less convex than the inner; pedicle near the center of the base; fingers slender, curved, well set off from hand; chela, pedicle excluded, 0.9 mm.

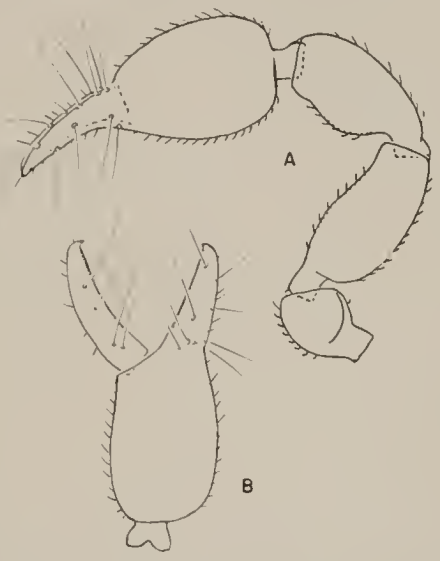
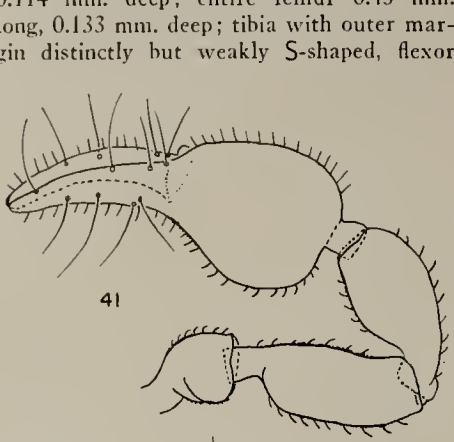


Fig. 40.—*Dinocheirus solus*, holotype ♂. *A*, dorsal view of palp; *B*, lateral view of chela.

long, 0.37 mm. wide; chelal hand 0.495 mm. long, 0.34 mm. deep; movable finger of chela 0.46 mm. long. From the side, hand, fig. 40*B*, appears somewhat quadrangular in general outline; pedicle displaced far toward the ventral side; ventral margin weakly convex, dorsal margin more convex; fingers moderately stout, the fixed finger nearly straight, the movable finger gently curved. Each finger with about 40 marginal teeth, conical and with well-developed cusps at the distal end of the row but rounded and acuspid at the proximal end of the row; each finger with five external accessory teeth; movable finger with three, fixed finger with two, internal accessory teeth. Nodus ramosus of movable finger located just distad from the level of tactile seta *st*. Fixed finger with a vestigial venedens and a short vestigial venom duct.

Legs.—Somewhat slender; yellow in color; pars tibialis and flexor surface of tibia of first leg weakly granular, otherwise pedal segments smooth; setae of the extensor surface of most segments paucidenticulate, slender, not clavate; setae of the flexor sur-

face of segments chiefly acuminate. First leg with pars basalis 0.133 mm. deep; pars tibialis with both margins evenly convex, 0.114 mm. deep; entire femur 0.43 mm. long, 0.133 mm. deep; tibia with outer margin distinctly but weakly S-shaped, flexor



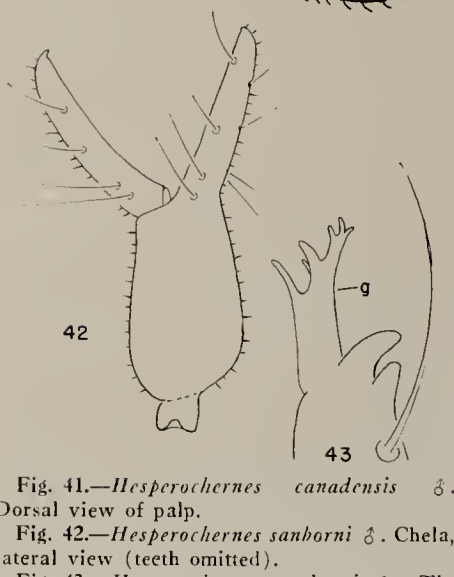


Fig. 41.—*Hesperochernes canadensis* ♂. Dorsal view of palp.

Fig. 42.—*Hesperochernes sanborni* ♂. Chela, lateral view (teeth omitted).

Fig. 43.—*Hesperochernes sanborni* ♂. Tip of movable finger of chelicera; *g*, galea.

margin convex, 0.342 mm. long, 0.088 mm. deep; tarsus tapering very little toward the distal end, 0.315 mm. long, 0.061 mm. deep. Fourth leg with pars basalis 0.14 mm. deep, pars tibialis 0.151 mm. deep; entire femur with flexor margin nearly straight, extensor margin flatly convex, 0.545 mm. long, 0.151 mm. deep; tibia slender, extensor margin very weakly S-shaped, flexor margin weakly convex, 0.46 mm. long, 0.097 mm. deep; tarsus subcylindrical, tapering very little toward the distal end, 0.355 mm. long, 0.07 mm. deep; a short tactile seta located on the extensor surface 0.25 mm. from t proximal margin of the tarsus.

Genital Complex.—Posterior operculu with 17 irregularly placed setae on the fa of the operculum and along the posteri margin and with five setae on the posteri rim of the genital aperture; anterior ope culum with 31 irregularly placed setae, which the 4 medial ones are much long and stouter than the others.

Holotype, male.—Rockford, Winneba County, Illinois: taken from moist whe stubble, June 12, 1944, C. L. Remington.

19. *HESPEROCHERNES* Chamberl

Hesperochernes Chamberlin (1924, p. 8 Genotype, monobasic: *Hesperochernes laur* Chamberlin.

Hesperochernes Chamberlin. Beier (1932*c*, 174).

Cephalothorax clearly longer than wid carapace granular with two transverse car pacic furrows. Tergites divided, granul Palps stout, femur with well-defined pedic Setae of body and palps usually lightly, b clearly, clavate. Flagellum with four seta setae *b* and *sb* of hand of chelicera thicken and denticulate. The sensory seta *ist* of t fixed chelal finger is distad from *est; st* the movable chelal finger is found near to *t* than to *sb*. The tarsus of the four leg is without a true sensory seta, althou a short-toothed pseudotactile seta may present.

This is a common North American gen and is represented by a number of speci from the United States, Mexico, a Canada. *H. unicolor* (Banks) has been d scribed from Austin, Texas. Diagnost characters are illustrated in figs. 41, 42, 4

20. *ACUMINOCHERNES* new gen

DIAGNOSIS.—Chelicera with both tacti setae *b* and *sb* smooth and acuminate; fl gellum with four setae. Palps stout, set chiefly subclavate to clavate; some sexu dimorphism shown in palps; tactile se *st* nearer to *t* than to *sb;* tactile seta distad from *est,* fig. 44*D*. Fourth leg wi a tactile seta distad from the mid-point the tarsus. Seminal receptable of fema in the form of a long slender tubule term nating in a closed bulb or sac.

Genotype.—*Hesperochernes crassopalp* Hoff.

A very distinctive characteristic of th genus is the acuminate nature of both th

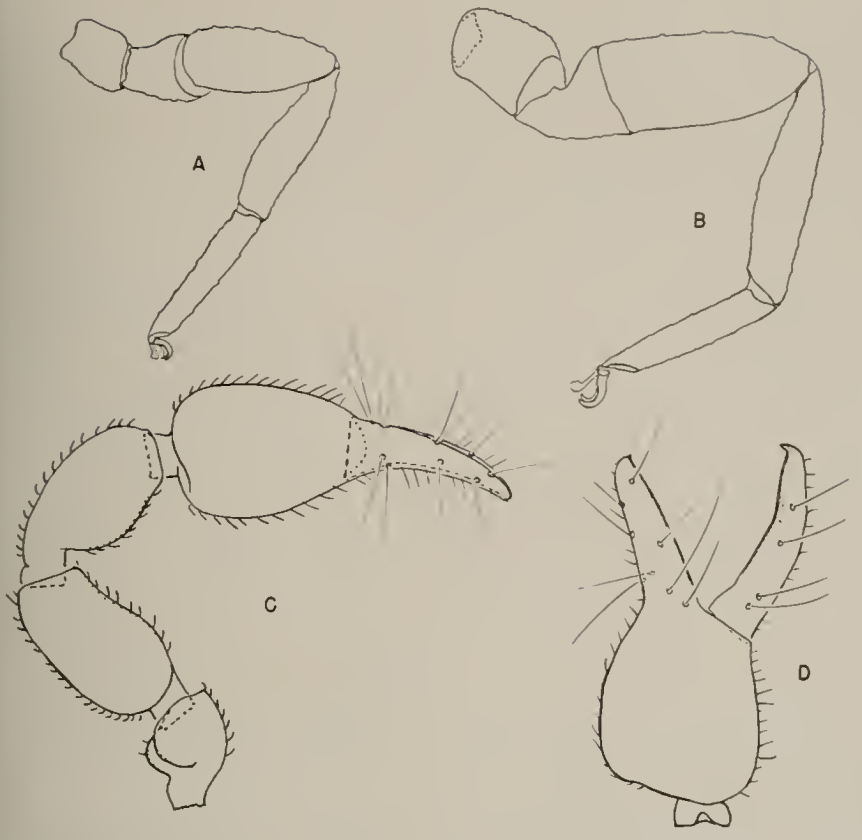


Fig. 44.—*Acuminochernes crassopalpus*. *A*, right leg I, ♀; *B*, right leg IV, ♀; *C*, dorsal ew of palp, ♀; *D*, lateral view of chela, ♂.

sal and subbasal setae of the base of the elicera. Only one species, the genotype, known.

Acuminochernes crassopalpus (Hoff) new combination

esperochernes crassopalpus Hoff (1945*a*, p. 43).

Since the present species has been deribed in detail in a previous publication Hoff 1945*a*), only measurements of the lpal segments and illustrations of chela id palp, figs. 44*D*, 44*C*, are given here. he members of this species may be recogzed by generic characteristics given in the y.

MALE.—The following pertinent measureents are expressed as the limits of range r nine individuals. Body length 1.8–2.1 m. Palpal femur 0.56–0.61 mm. long, 265–0.295 mm. wide, length 2.0 to 2.1 nes the width; tibia 0.56–0.61 mm. long, 0.26–0.3 mm. wide, length 2.0 to 2.2 times the width; palpal chela without pedicle 0.96–1.05 mm. long, 0.425–0.49 mm. wide, length 2.14 to 2.3 times the width; chelal hand 0.43–0.52 mm. deep, 0.48–0.52 mm. long exclusive of pedicle; movable chelal finger 0.53–0.59 mm. long.

FEMALE.—The following measurements are given as the range of six females. Body length 2.0–2.35 mm. Palps with femur 0.57–0.62 mm. long, 0.255–0.27 mm. wide, length 2.2 to 2.3 times the width; tibia 0.56–0.62 mm. long, 0.255–0.28 mm. wide, length 2.15 to 2.22 times the width; chela exclusive of pedicle 0.98–1.05 mm. long, 0.38–0.41 mm. wide, length 2.5 to 2.6 times the width; chelal hand exclusive of pedicle 0.49–0.54 mm. long, 0.375–0.425 mm. deep; movable finger 0.51–0.54 mm. long.

DISTRIBUTION.—This species, which was previously reported only from Arkansas, has been taken in eight collections in north-cen-

tral to southern Illinois. In addition, it was taken from pack-rat nests at Lawrence, Kansas, by R. H. Beamer of the University of Kansas.

Hesperochernes crassopalpus often occurs in great numbers in a collection, although on some occasions it is taken singly. Of the five Illinois collections bearing habitat data, three were secured from debris in hollow trees, one was made from a decayed log, and one came from the stomach of a red-bellied woodpecker.

Illinois Records.—CACHE: April 19, 1944, Ross & Sanderson, 4 ♂. EDGEWOOD: grass pile, July 25, 1947, Sanderson & Stannard, 7 ♀, 10 ♂. GILLESPIE: Aug. 30, 1944, Clarence & Marie Goodnight, 1 ♀. HERRIN: July 8, 1944, W. Snow, 1 tritonymph (WS). LAWRENCE: Aug. 25, 1944, W. Snow, 1 specimen. MAGNOLIA: March 23, 1944, Ross, great numbers of ♂ ♂, ♀ ♀, and nymphs. THOMASBORO: in corn mash, Nov. 10, 1947, Cooper, 1 ♀, 5 immatures. URBANA: Nov. 12, 1934, A. C. Toumey, 1 ♀ (HJV).

21. *MIROCHERNES* Beier

Mirochernes Beier (1930*b*, p. 216; 1932*c*, p. 182). Genotype, by original designation and monobasic: *Chelanops dentatus* Banks.

DIAGNOSIS.—Chelicera with flagellum of four setae; seta *b* of base of chelicera acuminate, seta *sb* denticulate; usually two acute denticles on the inner margin of the movable finger near the level of the insertion of the galeal seta. Palps stout, the chela of the male with an internal hooklike ornament on the hand, fig. 45*C*; sexual dimorphism marked in the palps; setae subclavate to clavate; tactile seta *st* nearer to *t* than to *sb*; tactile seta *ist* distad from *est*, fig. 45*A*. Fourth leg with tactile seta distad from the mid-point of the tarsus. Female with seminal receptacle consisting of a long tubule with a saclike bulb at the end.

The generic diagnosis has been amended above to include the tactile seta on the tarsus of the fourth leg. Previously, the tactile seta was reported as wanting (Beier 1932*c*, Hoff 1947). The tactile seta apparently had been broken from the fourth pedal tarsus of the male lectotype previously examined by the present writer (Hoff 1947) and its presence was, as a result, not reported.

Males of this genus are easily recognized by the unusual modification of the inner surface of the chelal hand. At the present time characters have not been found for the accurate recognition of females of this genus. The genus contains only the genotype.

Mirochernes dentatus (Banks)

Chelanops dentatus Banks (1895, p. 6).

Mirochernes dentatus (Banks). Beier (1930*b*, p. 216, but not pp. 217–218, fig. 14; 1932*c*, p. 182). Hoff (1947, p. 502).

Chernes dentatus (Banks). Chamberlin (1931*a*, p. 124).

The male of this species is easily recognized by the toothlike projection on the chelal hand, fig. 45*C*. From related Illinois pseudoscorpions the females may be differentiated by characters given in the key. The female is described here in considerable detail, since, up to the present time, this sex has been undescribed. The females of this species appear to be much more abundant than the males. In some collections, usually mixed with specimens of other species, are nymphs probably of this species. However, since it is impossible to state with certainty that the nymphs are of *dentatus*, they are not described here.

FEMALE.—Measurements given represent the range of eight females. Body and legs light brown in color; palps dark reddish-brown; legs moderately slender, palps stout; body fairly stout, 2.2–3.15 mm. long. Carapace darker and more red in color than the abdomen; transverse furrows well marked; no eye spots; anterior portion of carapace rounded, sides convex; greatest width near the center, slightly narrower across the posterior margin; surface moderately to coarsely granular; setae distinctly clavate, usually 12 setae along the posterior carapacic margin; carapace 0.82–0.99 mm. long, greatest width 0.67–0.85 mm., posterior width 0.64–0.82 mm. Abdomen ovate in general outline; tergites except the eleventh divided; interscutal spaces mostly wide and conspicuously granulate; each first half-tergite with six or seven setae; central tergal halves with as many as 10 setae, all clavate; surface of tergal scuta weakly to moderately granular. Sternites very weakly sculptured, sternites 4 through 10 divided; each fourth half-sternite with three or four setae, central tergal halves with as many as 14 setae, all acuminate; interscutal spaces wide and very weakly sculptured, striate to granulate. Each anterior stigmatic plate with three setae, each posterior plate with one; pleural membranes very rugose and papillose; abdomen 1.4–2.2 mm. long, greatest width 1.05–1.6 mm.

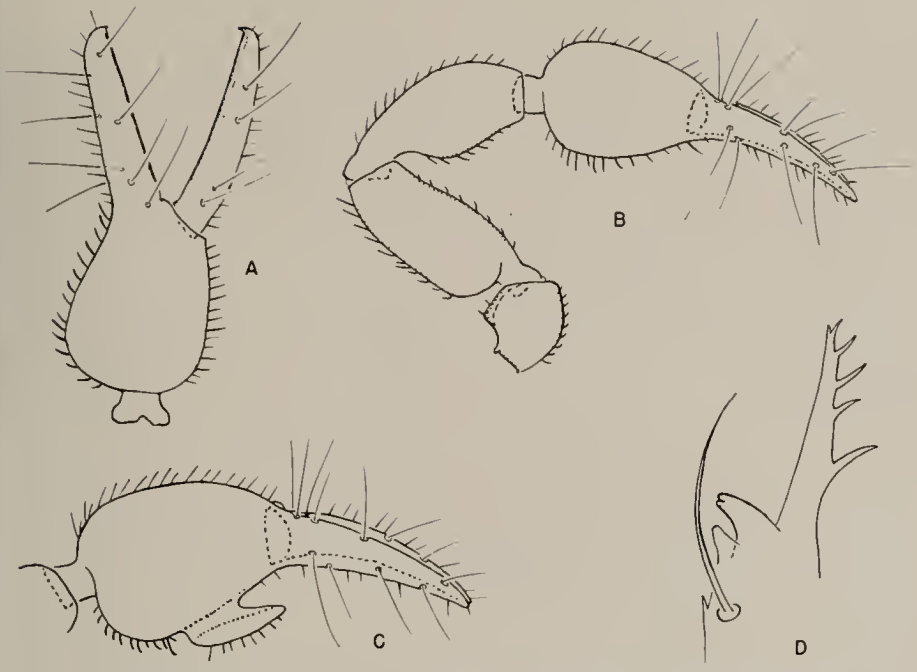


Fig. 45.—*Mirochernes dentatus*. *A*, lateral view of chela, ♀ ; *B*, dorsal view of palp, ♀ ; *C*, dorsal view of chela, ♂ ; *D*, tip of movable chelicеral finger, ♀.

Chelicera.—Fairly stout, yellow in color; exterior aspect of base of hand sculptured with netlike markings; subbasal seta terminally and subterminally denticulate, basal seta acuminate; chelicera between 0.25 and 0.3 mm. long, width of base 0.145–0.17 mm., length of movable finger 0.21–0.25 mm. Fixed finger with three denticles on the inner surface of the apical tooth and usually two large and three small denticles on the inner finger margin; lamina exterior well developed and extended as a keel along the base of the chelicera; all except the distal four plates of the serrula interior fused into a velum. Movable finger, fig. 45*D*, only a little curved; subapical lobe large; one or two acute but small denticles present on the inner finger margin near the level of the insertion of the galeal seta; serrula exterior of 18 to 19 plates; galeal seta reaching only about half way to the tip of the galea; galea with usually six terminal and lateral rami, all simple and arranged along little more than the terminal one-half of the galea.

Palp.—Fig. 45*B*. Surface moderately granular on trochanter and femur, tibia weakly granular except smooth on the extensor surface, the ventral face of the maxilla and most of the chela virtually smooth; setae of maxilla acuminate, setae of the trochanter and femur subclavate, setae of the flexor surface of the tibia and chelal hand multidenticulate while those of the extensor surface of the tibia and chelal hand are paucidenticulate; setae of the fingers acuminate. Maxilla 0.43–0.51 mm. long, 0.27–0.35 mm. wide, length 1.4 to 1.6 times the width. Trochanter stout, with two well-rounded protuberances; 0.435–0.51 mm. long, 0.24–0.3 mm. wide, length 1.65 to 1.82 times the width. Femur with a cylindrical pedicle, about as long as wide; femur enlarged suddenly beyond the pedicle and slightly narrowed toward the distal end; extensor margin flatly convex in the central portion; flexor margin slightly S-shaped; femur widest near the center; femur along the extensor margin 0.6–0.75 mm. long, 0.26–0.325 mm. wide, length 2.27 to 2.34 times the width. Tibia with pedicle larger than that of the femur and about as long as wide; flexor margin rounded and bulging except flattened or a little concave near the distal end; extensor margin flatly convex except in the terminal one-third; 0.61–0.8 mm. long, 0.27–0.34 mm. wide, length

2.17 to 2.43 times the width. Chela with hand stout, fingers slender and gently curved; both extensor and flexor margins of chelal hand convex, the flexor much more so than the extensor; hand tapering rapidly toward the fingers; pedicle displaced toward the extensor side of the hand; chela exclusive of pedicle 1.07–1.33 long, 0.365–0.465 mm. wide, length 2.6 to 3.0 times the width; chelal hand exclusive of pedicle 0.48–0.6 mm. long, 0.38–0.475 mm. deep; movable chelal finger 0.625–0.78 mm. long. From the side, chelal hand, fig. 45*A*, appears stout; pedicle displaced far toward the ventral side; fixed finger nearly straight, movable finger usually a little curved. Marginal teeth of chelal fingers conical, contiguous, and with well-defined cusps; usually 50 to 60 marginal teeth on each finger, with slightly more on the fixed than on the movable finger; accessory teeth variable, usually two to four internal accessory teeth and six to eight external accessory teeth. Nodus ramosus of movable finger usually very near the level of tactile seta *st*. Tactile setae of chelal fingers as shown in the figure.

Legs.—Yellow in color; setae of the flexor surface of segments (except pars tibialis of fourth leg) chiefly acuminate, fairly long and numerous; setae of the extensor surface multidenticulate to paucidenticulate; surface of segments smooth except very weakly granular on the femoral parts of the fourth leg and sometimes on the femur of the first leg. First leg with pars basalis 0.16–0.197 mm. deep; pars tibialis slender, extensor margin weakly curved, flexor margin nearly straight to very weakly curved, 0.129–0.155 mm. deep; entire femur 0.48–0.61 mm. long, length 2.98 to 3.28 times the depth; tibia very weakly S-shaped, 0.36–0.46 mm. long, 0.093–0.114 mm. deep, length 3.85 to 4.2 times the depth; tarsus very slender, tapering a little toward the distal end, 0.37–0.45 mm. long, 0.06–0.072 mm. deep, length 5.6 to 6.6 times the depth. Fourth leg with pars basalis 0.175–0.212 mm. deep; pars tibialis 0.188–0.225 mm. deep; entire femur somewhat slender, extensor margin evenly hut not strongly convex, flexor margin nearly straight, 0.63–0.8 mm. long, length 3.26 to 3.55 times the depth; tibia S-shaped with the extensor margin markedly concave in the distal two-thirds, 0.5–0.645 mm. long, 0.114–0.133 mm. deep, length 4.35 to 4.85 times the depth; tarsus tapering a little toward the distal end, 0.43–0.53 mm. long, 0.076–0.088 mm. deep, length 5.5 to 6 times the depth; tactile seta present tarsus and located about two-thirds of segment length from the proximal marg of the segment, seta short and easily brok

Genital Complex.—Usually about 10 se along the posterior margin of the poster operculum and 18 to 22 setae scattered the anterior operculum. Seminal recepta with surface of bulb at end of tubule rug or wrinkled.

MALE.—Description based on two Illin males; the measurements of one are giv in parentheses following the correspond measurements of the other. Body, appe ages, and most details as in the female. T chela, fig. 45*C*, is much stouter than in female and bears a hooklike appendage the subflexor surface. Body length 2.3 (2 mm.; carapace 0.97 (0.88) mm. long, 0 (0.77) mm. wide; cheliceral finger 0 (0.24) mm. long. Palp with maxilla (0.49) mm. long, 0.35 (0.33) mm. wi trochanter about 0.5 mm. long and 0.3 m wide; femur 0.8 (0.75) mm. long, 0 (0.325) mm. wide; tibia 0.83 (0.76) m long, 0.365 (0.33) mm. wide; chela exc sive of pedicle 1.38 (1.32) mm. long, wi exclusive of hook 0.525 (0.51) mm.; che hand exclusive of pedicle 0.67 (0.65) m long, 0.56 (0.54) mm. deep; movable che finger 0.75 (0.77) mm. long. First leg w pars basalis 0.212 (0.178) mm. deep; pa tibialis 0.17 (0.145) mm. deep; entire fem 0.63 (0.57) mm. long; tibia 0.465 (0.4 mm. long, 0.118 (0.106) mm. deep; tars 0.45 (0.41) mm. long, 0.076 (0.071) m deep. Fourth leg with pars basalis 0 (0.194) mm. deep, pars tibialis 0.24 (0.21 mm. deep; femur 0.78 (0.73) mm. lo tibia 0.64 (0.59) mm. long, 0.145 (0.13 mm. deep; tarsus 0.53 (0.48) mm. lo 0.092 (0.09) mm. deep; tactile seta pres on tarsus as in the female.

Genital Complex.—Between 20 and setae on the posterior operculum with 4 6 smaller setae on the very posterior r of the genital aperture; nearly 30 scatter setae on the anterior operculum.

DISTRIBUTION.—This widespread easte species, originally described from Flori has been collected from nine localities Illinois, ranging from the central to t southern part of the state.

Two collections were taken from fun one from a rotten log, three from tree hol three from ground cover and woody debr

u from mammal nests, and one from the omach of a red-bellied woodpecker.

Illinois Records.—CACHE: debris in hol- tree, April 19, 1944, Ross & Sanderson, . CAHOKIA: "50" on cork, Aug. 6, 1943, . Snow, 1 ♀ (WS). HAVANA: debris and st in log, Nov. 9, 1943, Ross & Sanderson, ; ground cover below levee near river, ov. 9, 1943, Ross & Sanderson, 1 ♀. ERRIN: July 24, 1944, W. Snow, 1 ♀ (WS). AMPSVILLE: leafy and woody debris on hill- le, Sept. 30, 1943, Ross & Sanderson, 1 ♂. NARGA: fungus in tree hole, July 22, 1943, . H. Ross, 2 ♀. QUINCY: near Burton's ave, mouse nest and dead wood in hollow ag, April 27, 1944, C. Hoff, 1 ♂ (CH). RBANA: in rotten log, March 29, 1942, H. . Ross, 1 ♀; tree hole, Nov. 12, 1944, W. ow, 1 ♀ (WS); University Woods, stom- h of red-bellied woodpecker, Nov. 12–13, 34, A. C. Toumey, 1 ♀ (HJV). WHITE EATH: "ex-fungi," Aug. 5, 1939, Ross & egel, 2 ♀.

22. *ILLINICHERNES* new genus

DIAGNOSIS.—Chelicera with flagellum of ur setae; basal seta of cheliceral hand uminate, subbasal seta denticulate. Palps irly stout; setae, figs. 46*C*–46*E*, of palps d mure especially of dorsum of body bi- erally feathered, leaflike, and stout; tae of sternal scuta chiefly clavate; prox- al two-thirds of fixed chelal finger, fig. 46*B*, bearing long clavate setae; tactile seta *st* of movable chelal finger closer to *t* than tu *sb*; *ist* considerably distad from *est* on fixed chelal finger; both *ib* and *ish* distad from the level of *esb*; palps showing little sexual dimorphism. Tarsus of fourth leg without a tactile seta. Seminal receptacle of female not observed.

Genotype.—*Illinichernes distinctus* new species.

This genus appears closely related to the genus *Hesperochernes* Chamberlin, from which it may be separated without difficulty by the nature of the setae of the body and palps and the acuminate condition of the basal seta of the cheliceral hand. Only one species is known in the genus.

Illinichernes distinctus new species

This species is the only one known in the genus; hence, the diagnostic features of the genus are also the diagnostic features of the species. Several diagnostic structures are illustrated in fig. 46.

MALE.—Description based on three males, including the holotype. Measurements are given as the limits of range. Body stout; palps and legs moderately stout; body and legs light brown; palps deep reddish-brown or golden in color; body 1.7–1.85 mm. long. Carapace with anterior half rounded, lateral margins convex; surface coarsely granular; setae stout, wide, and feather-like in general appearance; no eye spots; median

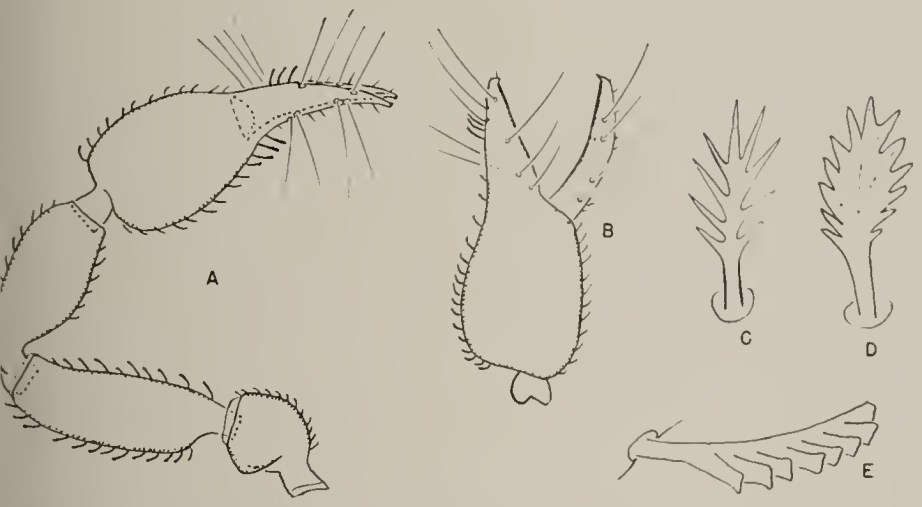


Fig. 46.—*Illinichernes distinctus*, holotype ♂. *A*, dorsal view of palp; *B*, lateral view chela; *C*, a seta of the palpal femur; *D*, another seta of the palpal femur; *E*, side view of a ta from the palpal femur.

transverse furrow a little posteriad to or near the center of the carapace, posterior furrow much nearer to the posterior carapacic margin than to the median furrow; 12 to 14 setae along the posterior margin of the carapace; length of carapace 0.65–0.72 mm., greatest width near the center and equal to 0.62–0.65 mm.; posterior width very slightly less than the greatest width. Abdomen oval, very stout; tergites except the eleventh divided; surface of tergites granular; interscutal spaces not especially wide, usually narrow; each scutum of first tergite with six to eight setae; maximum number of setae on any tergite is about 11; all tergal setae stout and clavate, like those of the carapace. Sternites 4 to 10 divided, interscutal spaces narrow and striate; setae of sternal halves varying from subacuminate on the anterior part of the abdomen to strongly clavate on the central and posterior portions; each fourth sternal scutum with 5 or 6 setae, maximum number on central sternites about 10; surface of sternal scuta with scalelike markings. Each anterior stigmatic plate with two or three small acuminate setae, each posterior plate with three. Pleural membranes very rugose and irregularly striate; length of abdomen 1.05–1.13 mm., width about 0.95–1.02 mm.

Chelicera.—Yellow in color; fairly stout; exterior surface of base marked by weakly developed netlike lines; subbasal seta with three or four terminal and subterminal spinules; basal seta smaller and acuminate; largest flagellar seta unilaterally serrate along the distal half; the two smaller flagellar setae subequal in length; chelicera about 0.19 mm. long and with the base 0.12 mm. wide; length of movable finger between 0.145 and 0.165 mm. Fixed finger slender; three small rounded teeth on the inner surface of the apical tooth followed by four (of which the basal two are weak) denticles along the inner finger margin. Movable finger with a long and slender apical tooth, subapical lobe moderately well developed but much shorter than the apical tooth; galeal seta reaching about to the level of the tip of the galea; galea straight and with two or three very minute denticles (often not discernible) confined to the distal one-third of the galea; serrula exterior consisting of 15 or 16 ligulate plates.

Palp.—Fig. 46*A*. Coarsely granular except on the chelal fingers; most setae of maxilla weakly clavate, with numerous denticulations; setae of trochanter, femur, tibia and chelal hand clavate, stout, very similar to those of the carapace and tergites; fixed finger with long clavate setae on the dorsal and extensor surfaces of more than the basal one-half of the finger, setae of the remainder of the fixed finger and the entire movable finger acuminate. Maxilla 0.33–0.3 mm. long, 0.25–0.26 mm. wide. Trochanter with well-defined pedicle about as long as wide; subspherical in shape beyond the pedicle; sublateral and subdorsal protuberances rounded and not much elevated, thickly set with setae on the flexor surface but very few setae on the extensor surface; trochanter 0.32–0.385 mm. long, about 0.21–0.242 mm. wide, length 1.5 to 1.6 times the width. Femur with a well-defined pedicle about as long as wide; femur subcylindrical beyond the pedicle except near the distal end; extensor margin flatly convex in the central part, a little more convex beyond; flexor margin very weakly convex in the central part and very weakly concave in the distal one-third or one-fourth; 0.6–0.69 mm. long, 0.21–0.225 mm. wide, length 2.85 to 3.05 times the width. Tibia pedicellate; extensor margin flatly convex in the central part but a little more convex near each end; flexor margin centrally rounded and somewhat bulging, flattened or very little concave in the distal part; tibia 0.57–0.63 mm. long, 0.225–0.25 mm. wide, length 2.5 to 2.5 times the width. Chela with both extensor and flexor margins of hand gently and evenly rounded; pedicle placed slightly toward the extensor margin; fingers relatively stout, slightly curved, and tapering gradually toward the distal end; chela exclusive of pedicle 0.84–0.955 mm. long, 0.34–0.36 mm. wide, length 2.45 to 2.6 times the width; chelal hand without pedicle 0.44–0.49 mm. long, 0.32–0.375 mm. deep; length of movable chelal finger 0.42–0.48 mm. From the side, chela, fig. 46*B*, fairly stout; pedicle displaced conspicuously toward the ventral side; ventral margin a little less convex than the dorsal margin; fixed finger stout and straight, tapering regularly toward the distal end; movable finger curved and more slender than the opposing finger. Movable finger with nodus ramosus between one and two areolar diameters basad from the level of tactile seta *st*. Tactile setae placed as shown in the figure. Marginal teeth of chelal fingers contiguous, and, except for a few proximal teeth, cusp-bearing

sually between 30 and 35 marginal teeth n each finger; movable finger usually with our or five external and one or two internal ccessory teeth; fixed finger with seven or ight external and two or three internal ccessory teeth. Vestigial venedens and ort venom duct on fixed finger.

Legs.—Moderately slender; most segents except the tarsi sculptured by scalee to granular markings; all setae except few on the distal portion of the tarsi ultidenticulate and clavate to subclavate. irst leg with pars basalis 0.13–0.14 mm. eep; pars tibialis slender, extensor margin little convex, flexor margin less convex to lmost straight, 0.11–0.12 mm. deep; entire emur 0.42–0.47 mm. long, length 3.2 to .35 times the depth; tibia with flexor marin a little convex, extensor margin very eakly concave in the distal two-thirds, .32–0.35 mm. long, 0.08–0.086 mm. deep, ength 3.95 to 4.1 times the depth; tarsus ith the extensor margin almost straight, exor margin a little convex, tapering somehat toward the distal end, 0.34–0.38 mm. ng, 0.058–0.064 mm. deep, length 5.85 to .4 times the depth. Fourth leg with the ars basalis 0.135–0.148 mm. deep; pars bialis 0.145–0.159 mm. deep; entire femur airly slender, extensor margin evenly conex, flexor margin nearly straight, 0.51–.595 mm. long, length 3.45 to 3.8 times he depth; tibia weakly S-shaped, 0.43–0.48 m. long, 0.09–0.1 mm. deep, length 4.6 o 4.9 times the depth; tarsus with both argins slightly convex, tapering in the disal one-half, 0.37–0.4 mm. long, 0.07–0.072 m. deep, length 5.3 to 5.6 times the depth.

Genital Complex.—Anterior operculum ith usually between 35 and 40 acuminate nd well-developed setae; posterior operulum with four to six multidenticulate etae along the posterior margin, with a otal of about 20 setae on the operculum.

FEMALE.—Measurements and ratios given re the ranges of three females, the allo-ype and two paratypes. Essentially like he male; body 1.95–2.05 mm. in length. Carapace with 14 to 16 marginal setae, .72–0.79 mm. long, greatest width 0.61–.69 mm., posterior width little less than he greatest width. Abdomen 1.15–1.3 mm. ng, 1.05–1.2 mm. wide.

Chelicera.—Chiefly as in the male except he galea with five terminal and subterminal ami, each minute and simple, but much ore highly developed and conspicuous than in the male; galeal seta not extending to the tip of the galea; serrula exterior of 16 to 17 plates; chelicera 0.21–0.22 mm. long, base 0.112–0.117 mm. wide, movable finger 0.15–0.155 mm. long.

Palp.—Virtually like that of the male. Maxilla 0.35–0.38 mm. long, 0.24–0.26 mm. wide, length 1.43 to 1.48 times the width; trochanter 0.36–0.39 mm. long, 0.22–0.24 mm. wide, length 1.58 to 1.6 times the width; femur measured along the extensor margin 0.64–0.73 mm. long, 0.21–0.225 mm. wide, length 2.97 to 3.22 times the width; tibia 0.58–0.66 mm. long, 0.225–0.25 mm. wide, length 2.43 to 2.64 times the width; chela exclusive of pedicle 0.88–0.975 mm. long, 0.325–0.37 mm. wide, length 2.55 to 2.7 times the width; hand of chela without pedicle 0.45–0.5 mm. long, 0.325–0.37 mm. deep; movable chelal finger 0.45–0.51 mm. in length. Tactile setae and teeth of chelal fingers as in the male.

Legs.—As in the male. First leg with pars basalis 0.133–0.143 mm. deep; pars tibialis 0.11–0.12 mm. deep; entire femur 0.44–0.51 mm. long, length 3.22 to 3.6 times the depth; tibia 0.34–0.38 mm. long, 0.085–0.09 mm. deep, length 3.92 to 4.22 times the depth; tarsus 0.35–0.38 mm. long, 0.065–0.07 mm. deep, length 5.0 to 5.6 times the depth. Fourth leg with pars basalis 0.137–0.152 mm. deep; pars tibialis 0.145–0.158 mm. deep; entire femur 0.56–0.64 mm. long, 3.65 to 4.05 times the depth; tibia 0.45–0.51 mm. long, 0.092–0.103 mm. deep, length 4.65 to 4.95 times the depth; tibia 0.39–0.42 mm. long, 0.069–0.076 mm. deep, length 5.3 to 5.8 times the depth.

Genital Complex.—Anterior operculum with 30 to 35 scattered setae; posterior operculum with 13 to 15 setae arranged in a single marginal row along the posterior margin of the operculum.

TRITONYMPH.—Observations and measurements based on three individuals. Body and appendages with color, sculpturing, and chaetotaxy much as in the adult; body 1.25–1.45 mm. long. Carapace usually with 10 to 12 setae along the posterior carapacic margin; carapace about 0.6 mm. long, 0.52 mm. wide. Tergites less sclerotic than in the adult; each first tergal scutum with five or six setae, central scuta with no more than eight setae. Sternites faintly sculptured, without color, weakly sclerotized; setae as in the adult, four or five setae on each fourth half-sternite, central sternal halves

with no more than six setae. Each stigmatic plate with two setae; abdomen 0.69–0.84 mm. long, 0.72–0.77 mm. wide.

Chelicera.—Like that of the female in all details including the nature of the galea, but smaller and less sclerotic. Chelicera 0.175–0.19 mm. long, base about 0.1 mm. wide; movable finger 0.13–0.135 mm. long; serrula exterior of 14 ligulate plates.

Palp.—Essentially like that of the male except the segments are smaller; the femur and tibia, especially the pedicles, are relatively stouter while the chela is a little more slender; the palps are a little lighter in color than in the male. Palps with maxilla 0.27–0.29 mm. long, 0.185–0.2 mm. wide, length about 1.45 times the width; trochanter about 0.285 mm. long, 0.17–0.18 mm. wide; femur measured along the extensor margin 0.45–0.47 mm. long, 0.16–0.17 mm. wide, length 2.75 to 2.85 times the width; tibia 0.42–0.45 mm. long, 0.175–0.185 mm. wide, length 2.4 to 2.45 times the width; chela exclusive of pedicle 0.66–0.68 mm. long, 0.245–0.25 mm. wide, length between 2.65 and 2.8 times the width; chelal hand without pedicle 0.33–0.34 mm. long, 0.24 mm. deep; movable finger 0.34–0.35 mm. long. From the side, the chelal hand appears less stout than that in the adult. Movable finger with three tactile setae: *t* about one-third of the finger length from the tip; *st* in the basal half of the finger and very little closer to *t* than to *sb*; *sb* between one-fourth and one-fifth of the finger length from the hand margin; *b* wanting; nodus ramosus about midway between *t* and *st*. Fixed finger with tactile setae much as in the adult except seta *ist* is wanting. About 25 or 30 marginal teeth on each finger; somewhat fewer accessory teeth than in the adult.

Legs.—Lighter in color, somewhat less sclerotic, smaller, and a little stouter than in the adult; surface of segments virtually without sculpturing; setae as in the adult. First leg with segments shaped much as in the adult except that the tibia and the tarsus are much stouter and the tarsus narrows more rapidly toward the distal end; entire femur 0.33–0.35 mm. long, length 3.1 to 3.2 times the depth; tibia 0.24 mm. long, 0.072–0.076 mm. deep, length 3.15 to 3.35 times the depth; tarsus 0.26–0.28 mm. long, 0.06–0.061 mm. deep, length 4.35 to 4.7 times the depth. Fourth leg much like that of the male; the flexor margin of the tibia evenly but weakly convex, the extensor margin virtually straight to a little concave in the distal two-thirds; the tarsus tapering markedly in the distal one-half; pars tibialis 0.114–0.122 mm. deep; entire femur 0.41–0.42 mm. long, length 3.45 to 3.6 times the depth; tibia 0.32–0.33 mm. long, 0.08–0.085 mm. deep, length 3.8 to 4.15 times the depth; tarsus 0.29–0.31 mm. long, 0.064–0.065 mm. deep, length 4.55 to 4.8 times the depth.

PROTONYMPH.—Description based on two individuals; measurements of one are given in parentheses after the measurements of the other whenever the two differ. Body stout; lighter in color than the adult; length 1.02 (0.94) mm. Setae of body, legs, and palps like those of the adult except much less numerous. Ten or 11 plates on the serrula exterior of the movable cheliceral finger. Palps much lighter in color than in the adult; surface of trochanter and femur granular, surfaces of tibia and chela slightly granulate or smooth; clavate setae on the side of the fixed chelal finger as in the adult. Palpal segments smaller and, with the exception of the chela, much stouter than in the tritonymph. Palpal femur 0.2 (0.21) mm. long, 0.095 mm. wide; tibia 0.2 mm. long, 0.105 (0.1) mm. wide; chela 0.39 (0.40) mm. long exclusive of pedicle, about 0.135 mm. wide; chela 0.135 mm. deep; hand exclusive of pedicle 0.2 (0.19) mm. long; movable finger 0.205 mm. long. Each chelal finger with between 15 and 20 marginal teeth, chiefly acuspid; no accessory teeth observed. Movable finger with one tactile seta (*t?*) near the center of the finger. Three setae on the fixed finger; two are external, one about one-third of the finger length from the tip and the other near the base; one is internal, located between one-third of the finger length from the base and the mid-point of the finger.

Holotype, male.—Magnolia, Illinois: decayed log, March 23, 1944, H. H. Ross.

Allotype, female.—Same data as for holotype.

Paratype.—ILLINOIS.—KELL: March 7, 1945, Ross & Sanderson, 2 ♂, 2 protonymphs, 1 tritonymph. MAGNOLIA: same data as for holotype, 2 ♀, 3 tritonymphs, 1 ♀ (CH).

No habitat data accompany the Kell collection.

23. *Genus? corticis* Ewing

Chelanops corticis Ewing (1911, p. 75).

In spite of the large number of collections available, I have been unable to associate

any of the Illinois specimens with *Chelanops corticis* described by Ewing. Since Ewing's description does not include generic key characters in use at present, and since it has been impossible to locate the types of this species, I am unable to assign *corticis* even tentatively to a genus. According to correspondence from J. C. Chamberlin, the species should serve as the genotype of a new genus. However, since no specimens are available for study, I hesitate to establish a new genus with *corticis* as the genotype.

From Ewing's description, it is apparent that the species belongs in the family Chernetidae and the subfamily Chernetinae.

On the basis of Ewing's description, it is possible to devise means of separating *corticis* from other species of the subfamily Chernetinae found in Illinois. Among the important characteristics listed for *corticis* in the original description and not found in other Illinois species are the following:

1. Galea very long, about two-thirds as long as the movable cheliceral finger.

2. The flexor margin of the palpal femur is bulging just distad from the pedicle; then is virtually straight for at least two-thirds of the length of the femur.

3. The flexor margin of the palpal tibia is markedly bulging in the basal half; then is virtually straight beyond; while the other margin beyond the pedicle is more or less evenly rounded.

4. The palpal hand is suboval in general shape and the palpal fingers are much stouter than in most species of Chernetinae.

5. The hairs of the fingers arise from minute tubercles.

Illinois Records.—In the original description two collections are cited, both from Illinois, as follows: HAVANA: from under bark of trees standing in water, Aug. 9, 1908, H. E. Ewing, 2 specimens; URBANA: March, 1902, J. W. Folsom, 2 specimens.

UNIDENTIFIED NYMPHS

Among the many collections examined, a few contained chernetid nymphs unassociated with adults or nymphs that are obviously of different species from the adults in the same collection. In these instances where certain association cannot be made between the immature and adult animals, it seems advisable to refrain both from describing the nymphs and from giving tentative identifications. Collections containing undetermined nymphs are from Champaign, Mason, Iroquois, Vermilion, St. Clair, Alexander, Will, Jackson, Calhoun, Lake, Madison, and Kane counties.

ATEMNIDAE

Members of this family are rare in the Western Hemisphere, being typically Oriental and Ethiopian in distribution. One species, *Paratemnus elongatus* (Banks), is known from Florida.

CHELIFERIDAE

Pseudoscorpions belonging in this family may be recognized by the absence of accessory teeth from the chelal fingers and by the presence of a venom apparatus and tooth on each of the chelal fingers, fig. 51*C*. The world fauna of the family is divided into three subfamilies. One of these, fig. 47, the Cheliferinae, is present in the central and eastern part of the United States. Another subfamily, the Withiinae, is represented in the fauna of America north of Mexico only by a few species, restricted as far as known to Texas and California.

KEY TO SUBFAMILIES

Flagellum with four or five setae; usually some abdominal sternites of the males with clusters of microsetae; coxae of male without coxal sacs; well-developed genital sacs lacking . . . . . **Withiinae**

Flagellum with three setae; male without clusters of microsetae on abdominal sternites; coxal sac present in the fourth coxa; well-developed genital sacs usually present, fig. 10 . . . . . **Cheliferinae**

Subfamily WITHIINAE

The subfamily is represented in the United States by only one genus, which has been reported from the southern part of the United States and from the West Coast region.

Subfamily CHELIFERINAE

The subfamily is characterized above in the key. Two tribes are described in the subfamily, both represented in Illinois.

KEY TO GENERA

1. Dorsal plates of the entire posterior half of the abdomen bearing a seta in the center of each of the sclerotized halves,

fig. 51*B*, in addition to the peripheral setae.....2

Dorsal plates of the posterior portion of the abdomen having only peripheral setae on each of the sclerotized halves,

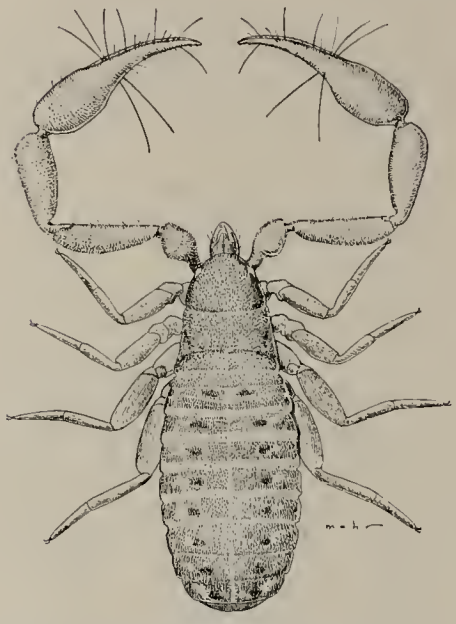


Fig. 47.—*Dactylochelifer copiosus*. An example of the suborder Monosphyronida and the family Cheliferidae.

except occasionally on last one or two segments, fig. 50*B*.....3

2. Tarsal claws of at least legs II and III distally split or having a small to medium subterminal inner tooth, as in fig. 50*D*, but larger; plumose setae of the carapace arising from greatly enlarged tubercles or warts; statumen convolutum of the male genitalia invaginated anteriorly, containing a median sclerotized rod within the invagination; fourth coxal male genital sac without a differentiated median atrium.....**24. Chelifer**

Tarsal claws of all of the legs without lateral or inner teeth; plumose setae of the carapace not arising from conspicuously enlarged warts; statumen convolutum of the male genitalia rounded anteriorly, not cleft, and without a median sclerotized rod, fig. 10; fourth coxal male genital sac having a well-marked atrium medially, fig. 10.....**27. Dactylochelifer**

3. Tibia and tarsus of leg IV subequal in length; coxae without spurs.....**26. Paisochelifer**

Tibia 1¼ times as long as the tarsus of leg IV; coxae IV of males with spurs near the anterolateral corner.....**25. Idiochelifer**

Tribe CHELIFERINI

In this tribe the male has coxal sacs that lack well-differentiated atria and the statumen convolutum of the genital complex is invaginated anteriorly to form a median depression in which lies a sclerotic rod. The female, almost without exception, has the median cribriform plates paired and separate, not fused together.

About a dozen genera have been placed in this tribe of which eight are known from the nearctic and neotropical regions and three from Illinois. A key to all the genera in the tribe is given by Hoff (1946*d*).

24. *CHELIFER* Geoffroy

Chelifer Geoffroy (1762, p. 617). Genotype, by subsequent designation of Simon (1879): *Acarus cancroides* Linnaeus.

Chelifer Geoffroy. Chamberlin (1932, p. 19), Beier (1932*c*, p. 235).

DIAGNOSIS.—Cephalothorax and palps granular; cephalothorax with numerous large granules scattered among the others; eyes present; tergites divided, anterior tergites of the male with lateral keels. Flagellum with subbasal seta of the base absent. Palp slender. Tarsus of the first pair of legs in the male without terminal spine; subterminal setae of fourth pedal tarsus denticulate; tarsal claws bifid except for modified claws of first leg of male.

A single species occurs in North America.

Chelifer cancroides (Linnaeus)

Acarus cancroides Linnaeus (1758, p. 616).

Chelifer cancroides Fourcroy (1785, p. 526).

Chelifer muricatus Say, in part (1821, p. 63).

Chelifer cancroides dentatus Ewing (1911, p. 73).

Chelifer cancroides (Linnaeus). Beier (1932*c*, p. 236), Hoff (1944*a*, p. 123).

Inasmuch as *cancroides* is the only known Illinois species of the genus *Chelifer*, it can be identified on the basis of the generic characteristics, figs. 9, 48. Measurements of several Illinois individuals are given below to show the variation that occurs in the palpal segments.

Through the kindness of Henry Dietrich of the Cornell University Museum, I have examined six males of the type collection of

Chelifer cancroides dentatus Ewing from Otto, New York. All of these were found to be typical *cancroides*.

Several nymphs, apparently of this species, were found in some of the collections. These nymphs differ markedly from the adults by having entire and not toothed tarsal claws on the legs. A description of the nymphal stages is postponed until a larger number of specimens can be secured for study.

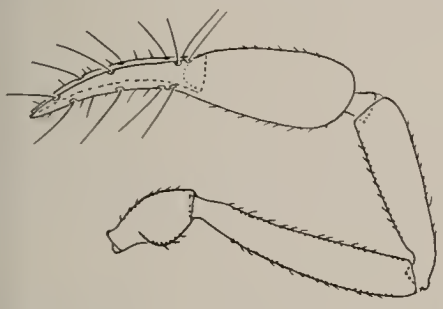


Fig. 48.—*Chelifer cancroides* ♀. Dorsal view of palp.

MALE.—Measurements and ratios are the ranges secured by measuring four males. Body length 2.55–3.2 mm.; palpal femur 1.16–1.29 mm. long, 0.21–0.25 mm. wide, length 5.2 to 5.55 times the width; tibia 0.95–1.15 mm. long, 0.24–0.275 mm. wide, length 3.85 to 4.1 times the width; chela exclusive of pedicle 1.6–1.85 mm. long, 0.4–0.475 mm. wide, length 3.9 to 4.1 times the depth; chelal hand exclusive of pedicle 0.75–0.9 mm. long, 0.36–0.45 mm. deep; movable chelal finger 0.85–1.05 mm. long.

FEMALE.—Measurements and ratios are given as the range of four females. Body length 3.3–3.7 mm.; palpal femur 1.15–1.2 mm. long, 0.21–0.25 mm. wide; length of femur 4.75–5.45 times the width; palpal tibia 0.95–1.05 mm. long, 0.24–0.28 mm. wide, length 3.75 to 4.1 times the width; chela exclusive of pedicle 1.55–1.8 mm. long, 0.37–0.46 mm. wide, length 3.95 to 4.25 times the width; hand exclusive of pedicle 0.75–0.85 mm. long, 0.35–0.45 mm. deep; movable finger 0.85–1.0 mm. long.

DISTRIBUTION.—This cosmopolitan species is invariably associated with man and may be found in dwellings, barns, granaries, beehives, and the nests of such birds as sparrows and starlings (Hoff 1944*a*). One collection in the present lot was taken from cattle. Although the species is thought to molest man only infrequently, one collection was labeled "Attacking People."

The species is much more common than the number of collections reported here would indicate because most of the collections used in this study were taken from natural habitats. Most of the pseudoscorpions brought to schools and museums for identification are of this species; people ordinarily do not encounter the species that occur in soil, under the bark of trees, and in other natural habitats.

Ewing (1911) recorded *cancroides* and its varieties from several localities in Illinois. Several of these records apply to other species, but the record of one specimen from a house in Arcola is probably true *cancroides*.

Illinois Records.—Many specimens of both sexes have been collected from Arcola, Champaign, Chicago, Deerfield, Freeburg, Glencoe, Palos Park, Quincy, Roodhouse, Shumway, Springfield, Urbana, Waukegan.

25. *IDIOCHELIFER* Chamberlin

Idiochelifer Chamberlin (1932, p. 19). Genotype, by original designation: *Chelifer cancroides* var. *nigripalpus* Ewing.
Idiochelifer Chamberlin. Hoff (1946*d*, p. 486).

DIAGNOSIS.—Cephalothorax a little longer than wide, with a few large, seta-bearing tubercles scattered among the investing granules; cephalothorax with two cross furrows; eyes present. Tergites divided, those of the male with crests or keels. Each coxa of the fourth leg of the male with a coxal sac and lateral spur; subterminal setae of the tarsus of the fourth leg *toothed, not simple*; tarsus of the first leg of the male without a terminal spine; claws of pedal tarsi simple except one claw of first leg of male with a well-developed accessory tooth; tarsus of the fourth leg with a tactile seta distad from the mid-point. Cribriform plates of female genitalia moderately small.

Among several females observed as belonging to the species *nigripalpus*, there was found one in which many of the tarsal claws of the legs have an accessory tooth. This is clearly an anomaly and does not necessitate a modification of the generic diagnosis.

The only species known in the genus occurs in Illinois.

Idiochelifer nigripalpus (Ewing)

Chelifer muricatus Say, in part? (1821, p. 63).

Chelifer cancroides var. *nigripalpus* Ewing (1911, p. 73).
Chelifer nigripalpus Ewing. Chamberlin (1931*a*, p. 52).
Idiochelifer nigripalpus (Ewing). Chamberlin (1932, p. 19), Hoff (1946*c*, p. 26).
Hysterochelifer longidactylus Hoff (1945*b*, p. 511).

It is probable that Say (1821) included specimens of *Idiochelifer nigripalpus* in his collection of *Chelifer muricatus*. Since types are not intact and since Say apparently based his description on several species, including *Chelifer cancroides* as indicated by the

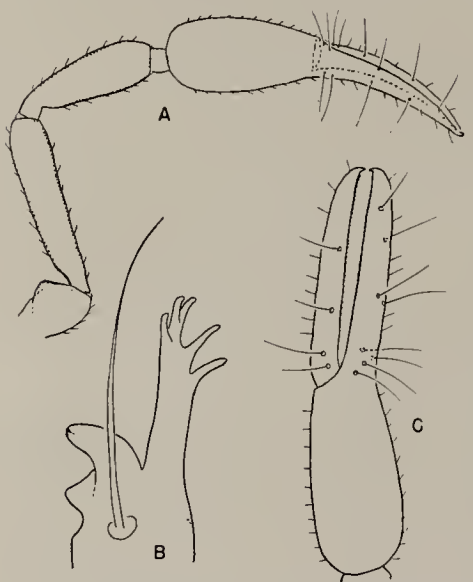


Fig. 49.—*Idiochelifer nigripalpus* ♀. *A*, dorsal view of palp; *B*, end of movable chelicerал finger; *C*, lateral view of chela.

record from a house, *Chelifer muricatus* must for all practical purposes be considered a *nomen nudum*.

In the original description of this species, no type specimens were indicated. Several specimens in the Cornell University collection are undoubtedly the types of the species, and one of these, from Ames, Iowa, was designated recently as the lectotype (Hoff 1946*c*).

Since the type specimens of this species have been described in some detail (Hoff 1946*c*) and the females have been described (Hoff 1945*b*) under the name *Hysterochelifer longidactylus* Hoff, only selected measurements of Illinois specimens are given here. Diagnostic parts are illustrated in figs. 49*A*–49*C*.

MALE.—Important measurements are given as the range of three males from Illinois. Body length 2.1–2.35 mm.; carapace 0.8 mm. long, ocular width 0.39–0.4 mm. Palpal femur 0.78–0.84 mm. long, 0.18–0.185 mm. wide, length 4.35 to 4.55 times the width; tibia 0.64–0.71 mm. long, 0.21 mm. wide; chela without pedicle 1.36–1.41 mm. long, 0.31–0.32 mm. wide, length 4.3 to 4.4 times the width; chelal hand exclusive of pedicle 0.63–0.65 mm. long, movable chelal finger 0.76–0.80 mm. long.

FEMALE.—Measurements of the palpal segments and body length are the ranges of four mounted females; other measurements are given as the ranges of three mounted individuals. Body length (abdomen somewhat contracted in some specimens) 2.1–2.55 mm.; carapace 0.82–0.86 mm. long, 0.8–0.86 mm. wide across the posterior margin; ocular width 0.4–0.44 mm. Chelicera about 0.24 mm. long, base 0.14–0.15 mm. wide; movable finger, fig. 49*B*, 0.18–0.195 mm. long. Palp, fig. 49*A*, with maxilla 0.4–0.45 mm. long, 0.26–0.29 mm. wide; trochanter about 0.43 mm. long, 0.24–0.25 mm. wide; femur 0.82–0.87 mm. long, 0.19–0.195 mm. wide, length 4.3 to 4.6 times the width; tibia 0.65–0.71 mm. long, 0.22–0.23 mm. wide, length 2.95 to 3.2 times the width; chela exclusive of pedicle 1.37–1.43 mm. long, 0.34–0.35 mm. wide, length 3.95 to 4.1 times the width; chelal hand exclusive of pedicle 0.65–0.68 mm. long, about 0.31 mm. deep; movable finger 0.75–0.79 mm. long. First leg with pars basalis 0.148–0.163 mm. deep, pars tibialis 0.137–0.14 mm. deep; entire femur about 0.5 mm. long; tibia 0.33–0.35 mm. long, 0.095–0.1 mm. deep; tarsus 0.35–0.37 mm. long, 0.072–0.076 mm. deep. Fourth leg with pars basalis 0.167–0.18 mm. deep, pars tibialis 0.243–0.265 mm. deep; entire femur about 0.7 mm. long; tibia 0.51–0.53 mm. long, 0.132–0.145 mm. deep; tarsus 0.4–0.415 mm. long, about 0.095 mm. deep; tactile seta located 0.28–0.30 mm. from the proximal margin of the tarsus.

DISTRIBUTION.—This species is known from several north-central states, including Illinois, Iowa, and Wisconsin. Undoubtedly several of Ewing's (1911) records of *cancroides* apply to this species. In the Museum of Comparative Zoology is a mounted female from Arcola (Douglas County), Illinois, that is labeled *Chelifer cancroides* and

that apparently was reported under this designation by Ewing. A mounted male of this species from Clark County, Illinois, in the Ewing collection at Cornell is labeled *Chelifer cancroides* and apparently was not included among the records given by Ewing for Illinois. These and other records indicate a scattered distribution for the species over the central and northern parts of Illinois.

Seven of the Illinois collections of this species were made from the bark of living trees, chiefly oaks and hickories; the eighth collection lacks ecological data.

Illinois Records.—ALPHA: April 19, 1946, C. Hoff, 1 ♂, 1 ♀; April 20, 1946, C. Hoff, 2 specimens (CH). ARCOLA: July 21, 1909, H. E. Ewing, 1 ♀ (MCZ). FOX LAKE: June 11, 1947, Burks & Stannard, 2 specimens. HOMER: July 3, 1944, H. H. Ross, 1 ♀. MAHOMET: July 10, 1943, Ross & Beaver, 1 ♀, 1 tritonymph. MARSHALL: Oct. 31, 1908, J. L. Pricer, 1 ♂ (CU). ROCKFORD: Nov. 29, 1944, C. L. Remington, 1 ♀ (CR). STARVED ROCK STATE PARK: July 12, 1944, Frison & Sanderson, 1 ♀.

26. *PAISOCHELIFER* Hoff

Paisochelifer Hoff (1946*d*, p. 487). Genotype by original designation: *Hysterochelifer callus* Hoff.

DIAGNOSIS.—Carapace wider than long, uniformly granular; transverse furrows deeply impressed, the posterior furrow about one-half as far from the posterior carapacic margin as from the median furrow; one pair of eyes. Tergites, including the eleventh, divided; lateral keels of the male wanting or very weakly developed. Flagellar setae of chelicera entire. Movable chelal finger with *st* nearer *sb* than to *t* and fixed finger with *est* and *ist* on nearly the same level and considerably proximad from the mid-point of the finger. Coxa of the fourth leg of the male with coxal sac; spurs of coxa IV lacking. Subterminal setae of the fourth tarsus weakly toothed. Tarsus of the first leg of the male without a terminal spine. Claws of pedal tarsi, except those of the first leg of the male, simple. A tactile seta located distad from the mid-point of the fourth pedal tarsus.

The genotype, the only species known in the genus, occurs in Illinois.

Paisochelifer callus (Hoff)

Hysterochelifer callus Hoff (1945*b*, p. 515).
Paisochelifer callus (Hoff). Hoff (1946*d*, p. 487).

The adults of this species have been described in detail in the original description (Hoff 1945*b*). Included here are additional data relative to the measurements of the body and palp, and illustrations of important structures, figs. 50*A*–50*E*. The deutonymph, previously unknown, is described in more detail.

MALE.—Measurements given as the range of three individuals, including the holotype. Body length 1.68–1.95 mm.; carapace 0.58–

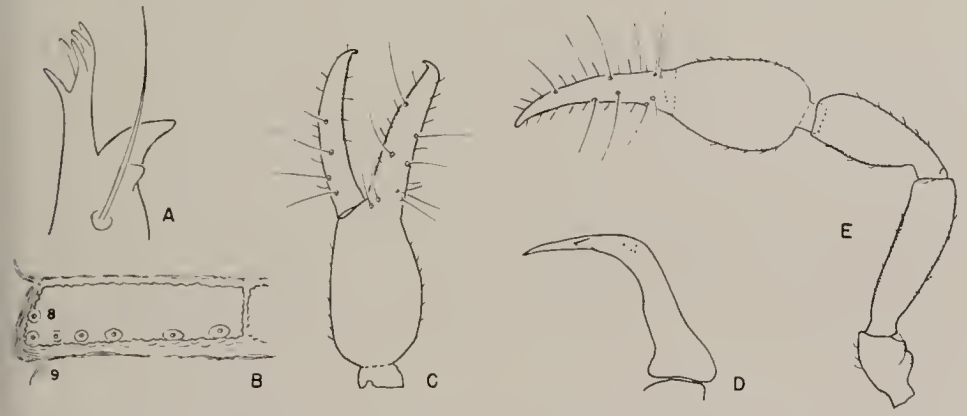


Fig. 50.—*Paisochelifer callus*. *A*, end of movable cheliceral finger, ♂ (many individuals, including the holotype, have two or three terminal and subterminal denticles on the apical tooth); *B*, setal map of left half of eighth abdominal tergite, holotype ♂; *C*, lateral view of chela, holotype ♂; *D*, lateral view of terminal claw of first leg, holotype ♂; *E*, dorsal view of palp, allotype ♀.

0.61 mm. long, greatest width 0.61–0.75 mm., ocular breadth 0.32–0.36 mm. Palp with trochanter 0.27–0.28 mm. long, 0.165–0.175 mm. wide, length 1.57 to 1.7 times the width; femur 0.52–0.56 mm. long, 0.155–0.165 mm. wide, length 3.35 to 3.5 times the width; tibia 0.47–0.5 mm. long, 0.18–0.197 mm. wide, length 2.5 to 2.65 times the width; chela exclusive of pedicle 0.89–0.945 mm. long, 0.27–0.295 mm. wide, length 3.2 to 3.45 times the width; chelal hand 0.41–0.46 mm. long exclusive of pedicle, 0.23–0.28 mm. deep; movable chelal finger 0.5–0.53 mm. long. Serrula exterior of the movable chelicera finger with 17 or 18 plates.

FEMALE.—Measurements given as the range of five females, including the allotype and two paratypes. Body length 1.55–2.15 mm.; carapace 0.63–0.69 mm. long, width usually a little greater than the length but less than the length in one individual; ocular width 0.35–0.38 mm. Palp including trochanter 0.26–0.3 mm. long, 0.16–0.18 mm. wide, length 1.55 to 1.66 times the width; femur 0.59–0.61 mm. long, 0.165–0.175 mm. wide, length 3.45 to 3.65 times the width; tibia 0.48–0.54 mm. long, 0.19–0.205 mm. wide, length 2.4 to 2.7 times the width; chela of palp exclusive of pedicle 1.0–1.07 mm. long, 0.285–0.315 mm. wide, length 3.2 to 3.5 times width; chelal hand exclusive of pedicle 0.48–0.51 mm. long, 0.26–0.295 mm. deep; movable finger 0.53-0.59 mm. long.

DEUTONYMPH.—Body and legs light yellowish-brown, palps a little darker; body fairly stout, appendages usually stouter than in the adult. Body length 1.3 mm. Carapace shaped much as in the adult; furrows less well impressed than in the adult; six setae along the posterior carapacic margin; length of carapace 0.44 mm., posterior and greatest width 0.43 mm.; ocular width 0.25 mm. Tergites divided, marked by netlike sculpturing; nearly all tergal halves with three setae similar in nature to those of the adult. Most sternites weakly divided, with very weak, scalelike markings; usually three setae on each half-sternite. Stigmatic plates and pleural membranes as in adult; abdomen 0.85 mm. long, about 0.52 mm. wide.

Chelicera.—In general, similar to the chelicera of the adult except lighter in color and smaller; subbasal seta of palm of hand wanting; galea with four simple rami; serrula exterior with 14 plates; chelicera 0.155 mm. long; base 0.085 mm. wide; movable finger about 0.1 mm. long.

Palp.—Moderately granular except the chelal fingers, investing setae much as in the adult; segments, with the possible exception of the chela, conspicuously stouter than in the adult. Trochanter about 0.18 mm. long, 0.12 mm. wide. Femur subcylindrical, widened gradually toward the distal end, pedicle almost wanting; both flexor and extensor margins nearly straight; 0.312 mm. long, 0.11 mm. wide. Tibia with weakly developed pedicle much wider than long; flexor margin very weakly convex; extensor margin flatly convex; 0.285 mm. long, 0.133 mm. wide. Chela as viewed from the dorsum with both margins of hand moderately convex, the flexor more so than the extensor; hand gradually narrowed toward the finger base; fingers evenly and gently curved; chela exclusive of pedicle 0.61 mm. long, 0.185 mm. wide; chelal hand exclusive of pedicle 0.29 mm. long, 0.167 mm. deep; movable finger 0.33 mm. long. Viewed from the side, chelal hand appears subcylindrical, ventral margin nearly straight, dorsal margin a little convex; fixed finger nearly straight, movable finger slightly curved. Marginal teeth of the chelal fingers much like those of the adult except the teeth of the basal one-half of the row of the movable finger are acuspid; about 25 teeth on each finger. Movable finger with two tactile setae: one (probably *t)* located a little proximad from the mid-point of the finger; the second (probably *sb*) located twice as far from the first as from the proximal margin of the finger; nodus ramosus located a little distad from the mid-point of the finger. Fixed finger with six setae: *et* a little less than one-third of the finger length from the tip; *it* a little closer to *et* than the latter is to the finger tip; *est* removed from *et* by about the distance of *et* from the finger tip; both *it* and *est* proximad from the mid-point of the finger; one exterior and two interior basal and subbasal setae placed much as in the adult; probably missing setae are *ist* and *esb*; nodus ramosus located less than two areolar diameters basad from tactile seta *et*.

Legs.—General characteristics as in the adult but much lighter in color, less sclerotic, and segments smaller and stouter. All tarsal claws simple. First leg with pars basalis 0.08 mm. deep; entire femur 0.209 mm. long; tibia very stout throughout, 0.133 mm. long, 0.06 mm. deep; tarsus subfusiform, narrowing in the distal half, 0.173 mm. long, 0.05 mm. deep. Fourth leg with the pars tibialis

0.103 mm. deep; entire femur 0.285 mm. long; tibia 0.194 mm. long, 0.071 mm. deep; tarsus 0.209 mm. long, 0.057 mm. deep; the tarsus subfusiform, becoming much narrowed in the distal one-half and bearing a tactile seta that is located 0.145 mm. from the proximal margin of the segment.

DISTRIBUTION.—This species is known only from Illinois. It was described originally from Zion, and since then another collection has been taken in the same locality.

DIAGNOSIS.—Carapace longer than wide, moderately and regularly granular, with two cross furrows. Eyes present. Tergites divided, those of the male without lateral keels or with very weakly developed keels. Setae of body and palp short, toothed, or weakly clavate. Palps moderately slender, with uniformly granular surface; tactile seta *it* about in the middle between *et* and *ist* or somewhat nearer to *et*, fig. 51*C*. Anterior tarsus of the male always strongly modified, the

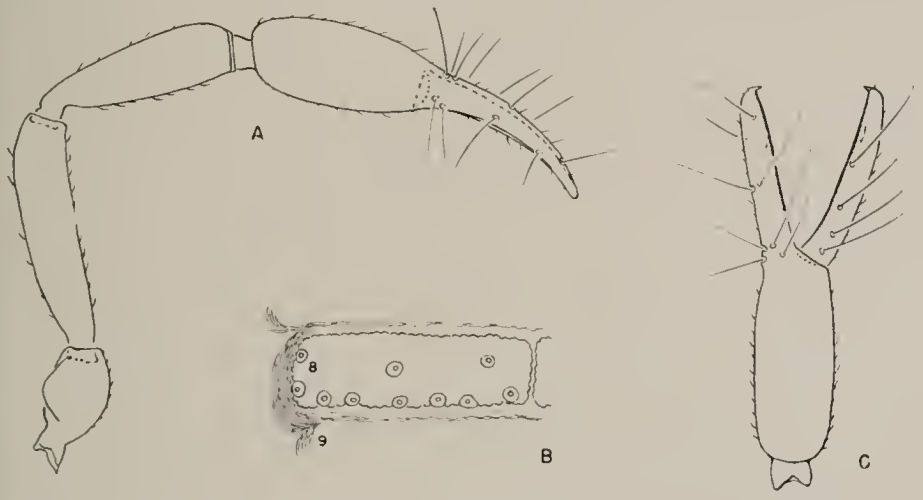


Fig. 51.—*Dactylochelifer copiosus* ♀. A, dorsal view of palp; *B*, setal map of left half of eighth abdominal tergite; *C*, lateral view of chela.

The type series was collected on March 17, 1933, from sand and grass roots in dunes area, Frison & Mohr, 1 ♂, 3 ♀; the later collection was made on October 15, 1942, from ground cover, Ross & Sanderson, 2 ♂, 2 ♀, 1 deutonymph.

Tribe DACTYLOCHELIFERINI

In this tribe, the males usually have a well-differentiated atrium in each coxal sac of leg IV and the sclerotic rod and anterior invagination of the statumen convolutum are always absent from the genital complex, fig. 10. The female has the medial pair of cribriform plates fused into one medial plate. Only one certain genus and one species are found in North America.

27. *DACTYLOCHELIFER* Beier

Dactylochelifer Beier (1932*a*, p. 64; 1932*c*, p. 253). Genotype, by original designation: *Chelifer latreillei* Leach.

claws asymmetrical; tarsal claws of other legs simple; subterminal setae of the tarsi simple; tarsus of leg IV without a tactile seta.

Only one species, *copiosus*, is known from the nearctic region, and this has been taken in Illinois. Other species of the genus occur throughout the palearctic region.

Dactylochelifer copiosus Hoff

Dactylochelifer copiosus Hoff (1945*a*, p. 53; 1945*b*, p. 521).

Adults of this species have been described in detail in the original description (Hoff 1945*a*). Additional data relative to the limits of range in size of the palpal segments and illustrations of important structures, figs. 10, 47, 51*A*–51*C*, are given here. In addition, brief descriptions are presented for the heretofore undescribed nymphal stages.

MALE.—Measurements given as the limits of range were secured by measuring 11 individuals from Illinois. Body length 2.3–2.6

mm. Palpal femur 0.8–0.91 mm. long, 0.193–0.215 mm. wide, length 3.9 to 4.25 times the width; tibia 0.72–0.82 mm. long, 0.225–0.245 mm. wide, length 3.0 to 3.4 times the width; chela 1.21–1.36 mm. long, 0.3–0.33 mm. wide, length 3.85 to 4.35 times the width; movable chelal finger 0.66–0.72 mm. long.

Female.—Measurements given as the limits of range secured from seven individuals from Illinois. Body length 2.4–3.15 mm. Palpal femur 0.82–0.91 mm. long, 0.19–0.22 mm. wide, length 3.9 to 4.6 times the width but usually 3.9 to 4.2 times the width; tibia 0.74–0.85 mm. long, 0.225–0.245 mm. wide, length 3.2 to 3.55 times the width; chela exclusive of pedicle 1.26–1.43 mm. long, 0.33–0.355 mm. wide, length 3.75 to 4.25 times the width; chelal hand exclusive of pedicle 0.61–0.72 mm. long; movable finger between 0.7 and 0.75 mm. in length.

Tritonymph.—Measurements given as the limits of range of four individuals. In general, in appearance much like the adult except a little lighter in color and the segments of appendages much smaller and often a little stouter. Body 1.8–2.4 mm. long. Chelicera 0.195–0.22 mm. long, movable finger 0.14–0.15 mm. long; 16 or 17 plates in the serrula exterior. Palp with trochanter 0.32–0.35 mm. long, 0.185–0.19 mm. wide, length 1.65 to 1.85 times the width; femur 0.55–0.65 mm. long, 0.15–0.17 mm. wide, length 3.65 to 3.95 times the width; tibia 0.53–0.6 mm. long, 0.17–0.19 mm. wide, length 3.1 to 3.25 times the width; chela 0.9–1.1 mm. long, 0.23–0.26 mm. wide, length 3.9 to 4.3 times the width; chelal hand 0.46–0.56 mm. long, 0.21–0.25 mm. deep; movable finger 0.50–0.54 mm. long. Fixed chelal finger with seven tactile setae, arranged much as in the adult except *ist* wanting and *it* placed a little closer to the level of *est* than to the level of *et*. Movable finger with three setae, either *b* or *sb* wanting. About 40 or 45 marginal teeth on each chelal finger.

Deutonymph.—Measurements given as the range of size of five individuals. Appendages and body much like those of the tritonymph except stouter and much smaller. Body length 1.45–1.6 mm. Serrula exterior of 13 or 14 ligulate plates. Palp with trochanter 0.23–0.24 mm. long, 0.125–0.135 mm. wide, length 1.75 to 1.85 times the width; femur 0.38–0.40 mm. long, 0.11–0.12 mm. wide, length 3.25 to 3.45 times the width; tibia 0.35–0.37 mm. long, 0.13–0.1 mm. wide, length 2.55 to 2.7 times the wid chela 0.68–0.715 mm. long, 0.18–0.195 m wide, length 3.6 to 3.85 times the wid chelal hand 0.34–0.39 mm. long, 0.17–0.1 mm. deep; movable finger 0.34–0.37 m long. Movable chelal finger with two set one near the proximal margin, the oth near the mid-point of the finger; homolog uncertain. Fixed finger with three exter setae, either *eb* or *esb* wanting; three terior setae as in the tritonymph except relatively closer to the level of *est*. E chelal finger with about 35 marginal teet

Protonymph.—Measurements based five individuals. Appendages and bo smaller than in the deutonymph. Palpal s ments smaller and, with exception of chela, appreciably stouter than in the deu nymph. Body 1.15–1.3 mm. long. Serr exterior of chelicera with 12 plates. P with trochanter 0.17–0.18 mm. long, 0 0.11 mm. wide, length 1.6 to 1.8 times width; femur 0.28–0.29 mm. long, 0.0 0.1 mm. wide, length 2.85 to 3.05 times width; tibia 0.25–0.26 mm. long, 0.105–0 mm. wide, length 2.15–2.4 times the wid chela 0.55–0.58 mm. long, 0.145–0.16 m wide, length 3.55 to 3.8 times the wid chelal hand exclusive of pedicle 0.27–0.3 m long, 0.135–0.155 mm. deep; movable fin 0.29 mm. long. Movable chelal finger w one tactile seta located about one-third the finger length from the proximal marg Fixed chelal finger with two exterior set one located less than one-third of the fin length from the tip and the other pla near the base of the finger; a single s of the interior series located near the fin base. About 30 teeth on each chelal finge

Distribution.—This species is kno from only two states, Arkansas, from wh it was originally described, and Illino from which it was recorded later (H 1945*b*). Illinois collections are from sc tered localities over the state, with coll tions more abundant in the southern half

Almost every collection was taken fr ground cover and litter, although one w made while sweeping vegetation with a n

Illinois Records.—All stages have b collected from Burksville, Edwardsvi Geff, Giant City State Park, Gilles Grand Detour (Castle Rock), Hava Herod, Logan, Makanda, Murphysbo New Columbia, Pere Marquette State Pa Vienna.

UNIDENTIFIED NYMPHS

Several collections contain nymphs of heliferidae that I have found impossible inadvisable to determine as to genus or species. These undetermined cheliferid nymphs are from the following counties: Adams, Carroll, Hardin, Jackson, Jersey, La Salle, Macoupin, Madison, Mason, Schuyler, and Union.

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INDEX

The page entries in boldface type refer to the principal treatment of various categories from suborders to subspecies and varieties. Names that are synonyms, or of changed generic assignment, are indicated by *italic* type.

INDEX

The following index covers Article 3 of Volume 24 of the Illinois Natural History Survey Bulletin. An index of Article 1, *The Mosquitoes of Illinois (Diptera, Culicidae)*, by Herbert H. Ross, begins on page 95 of this volume. An index of Article 2, *The Leafhoppers, or Cicadellidae, of Illinois (Eurymelinae—Balcluthinae)*, by D. M. DeLong, begins on page 367 of this volume. An index of Article 4, *The Pseudoscorpions of Illinois*, by C. Clayton Hoff, begins on page 497 of this volume.

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