

## CLARIFICATION OF THE GENERA *HESPEROCHERNES* AND *DINOCHEIRUS* (PSEUDOSCORPIONIDA, CHERNETIDAE)<sup>1</sup>

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### ABSTRACT

The chernetid genera *Hesperochnes* Chamberlin and *Dinocheirus* Chamberlin are redefined in the light of recent knowledge and are compared with *Chernes* Menge, type genus of the family Chernetidae. Redescriptions of the type species *Hesperochnes laurae* Chamberlin and *Dinocheirus tenoch* Chamberlin and three new combinations, *Hesperochnes mirabilis* (Banks), *Hesperochnes occidentalis* (Hoff and Bolsterli) and *Dinocheirus bouvieri* (Vachon), are included.

### INTRODUCTION

As I have pointed out earlier (Muchmore, 1972), the pseudoscorpion family Chernetidae is in urgent need of revision. Large numbers of genera have been assigned to the family over the years, but the relationships among them have not been reviewed carefully in the light of recent knowledge and are not at all clear. In spite of its venerable age and the commonness of its species, *Chernes* Menge, type genus of the family, is actually not very well known. Further, its relations to the common American genera *Hesperochnes* Chamberlin and *Dinocheirus* Chamberlin have been so misunderstood that an unnatural grouping of genera has been adopted; specifically, the subfamily Chernetinae Beier, which itself is suspect (see Muchmore, 1972, p. 113), has been divided into the tribes Chernetini Beier and Hesperochnetini Beier mainly on the basis of a supposed difference in the number of setae in the cheliceral flagellum. As it turns out, members of *Chernes*, type genus of the Chernetini, like *Hesperochnes*, type genus of the Hesperochnetini, possess four setae in the cheliceral flagellum (although species of many genera usually placed in the Chernetini do in fact have a flagellum of only three setae). Though the possibility that Hesperochnetini and Chernetini are synonymous was suggested by Hoff a number of years ago (1956, p. 13), Beier (1963) persisted in considering that members of *Chernes* have only three flagellar setae (except teratologically) and in maintaining the distinction between the two tribes. It is clear to the present author that the Chernetini and Hesperochnetini as defined by Beier are indistinguishable, that the subfamilies Chernetinae and Lamprochnetinae are poorly conceived, and that a great amount of work must be done before a satisfactory understanding of chernetid relationships can be attained. Restudy of the species of most genera, together with extensive critical comparisons, is a necessary first step in this process. The present paper

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makes a beginning to the work by redefining the genera *Hesperocheernes* and *Dinocheirus* and comparing them with *Chernes*.

#### FAMILY CHERNETIDAE CHAMBERLIN

Chernetidae Chamberlin, 1931, p. 241. Beier, 1932, p. 80. Hoff, 1956, p. 4. Beier, 1963, p. 248.

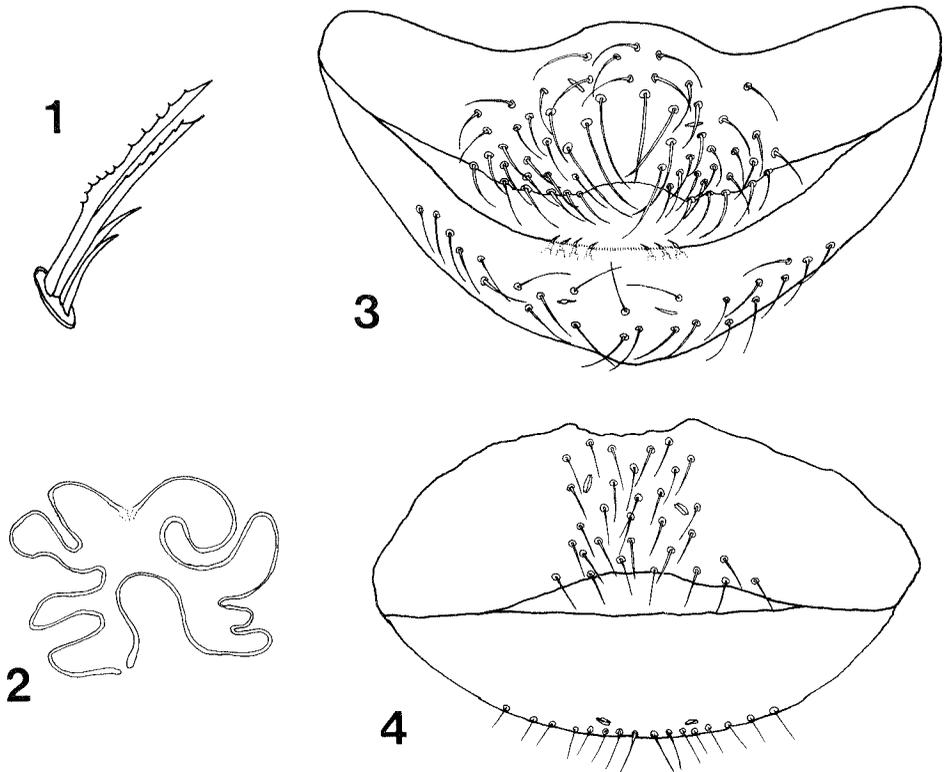
Members of the family Chernetidae may be diagnosed simply as follows: all legs monotarsate; venom apparatus well developed only in the movable chelal finger, poorly developed or absent in fixed finger; chelal fingers usually with accessory teeth external and internal to the marginal row; each tarsus with an elevated slit sensillum ("sense dome") on the outer margin proximad of the middle.

#### Genus *Chernes* Menge

Figs. 1-4.

*Chernes* Menge, 1855, p. 39. Beier, 1932, p. 154 (see this paper for other synonymy). Beier, 1963, p. 273.

While a complete redefinition of *Chernes* is desirable, it is not possible for me to accomplish that task at the present time. Nevertheless, it is necessary to emend the



Figs. 1-4.—*Chernes cimicoides* (Fabricius): 1, cheliceral flagellum; 2, spermathecae of female; 3, genital opercula of male; 4, genital opercula of female.

diagnosis of the genus by acknowledging the presence of *four setae in the cheliceral flagellum* (Fig. 1). In my experience four setae occur regularly in representatives of *Chernes*, though it is conceivable that in some species or some populations the number has been reduced to three (as implied by Beier, 1963, p. 273). A broad critical survey of European forms will be necessary in order to resolve this problem.

Also it must be noted here that, according to all the evidence I can find, the spermathecae of *Chernes* females are paired and in the form of long, thin tubules *without distinct terminal enlargements* (Fig. 2). This is in clear contrast to the closely allied genera *Hesperochnes* and *Dinocheirus*, which have conspicuous spherical or ovoid enlargements of the ends of paired tubular spermathecae (Figs. 9 and 16).

Experience has shown that the chelicera of *Chernes* species usually has seta *sb* terminally denticulate while *b* and *es* are acuminate. This is similar to the situation in *Dinocheirus* species, but different from that in *Hesperochnes* species where both *sb* and *b* are denticulate (see below).

The chaetotaxies of male and female genital opercula of *Chernes cimicoïdes*, generally characteristic of the Chernetidae, are shown in Figs. 3 and 4.

#### Genus *Hesperochnes* Chamberlin

*Hesperochnes* Chamberlin, 1924, p. 89. Beier, 1932, p. 174. Hoff, 1949, p. 476. Hoff and Clawson, 1952, p. 14. Hoff, 1956, p. 31. Hoff, 1958, p. 22; p. 48. Hoff, 1963, p. 3.

**Type species**—*Hesperochnes laurae* Chamberlin, 1924.

**Diagnosis** (emended)—A genus of the family Chernetidae. Surfaces of carapace, abdominal sclerites and palps generally granulate; dorsal vestitural setae denticulate and often expanded distally, ventral setae acuminate or denticulate; setae of genital opercula and spiracular plates acuminate; 11th tergite and sternite with or without long, acuminate tactile setae; pleural membranes roughly, longitudinally striate; carapace with two distinct transverse furrows; eyes absent, or present as two very faint spots; cheliceral hand with five setae, *b* and *sb* terminally denticulate, the others acuminate; flagellum of four setae, including two long ones distally and two short ones lying close together proximally, the distalmost seta heavily dentate along margin, the others often finely denticulate at distal ends; palpal chela of male sometimes larger and stouter than that of female; venom apparatus well developed in movable chelal finger, vestigial or absent in fixed finger; trichobothrium *st* of movable finger closer to *t* than to *sb* and near middle of finger; *ist* on fixed finger distinctly distad of *est*, which is near middle of finger; tarsus of each leg with an elevated slit sensillum on extensor margin within basal half of segment; tarsus IV without a long, acuminate tactile seta, but sometimes with an elongated seta distally which is terminally denticulate; anterior genital operculum of male with a group of 20-25 setae, including 4-6 larger ones medially; posterior operculum of male with 2-3 small setae on either side beneath middle of anterior margin and 15-25 setae on face and along posterior margin; female anterior genital operculum with about 20-30 setae centrally on face and posterior operculum with a row of about 10-15 small setae along posterior margin; spermathecae of female paired and in form of long, thin tubules with conspicuous ovoid or spheroid terminal enlargements.

**Remarks**—Hoff and Clawson (1952, p. 14) stated that, "At the present authors' request, Chamberlin has reexamined the type material [of *Hesperochnes laurae*] and reports that seta *b* is apparently non-denticulate, although it is possible that minute

denticles may be present." From this, the authors concluded that, "It now becomes impractical to use the denticulate character of seta *b* for separating related genera." However, my own observation of the type material of *H. laurae* reveals that *b* is clearly denticulate at the tip on all chelicerae but one, where it does appear acuminate; and in other *Hesperochnes* material it is only very rarely that *b* is not at least finely denticulate terminally. Thus it seems clear that the denticulate character of *b*, as well as of *sb*, is sufficiently constant in species of *Hesperochnes* to be useful for diagnostic purposes. On this basis, then, members of *Hesperochnes* are distinguishable from those of *Chernes* and *Dinocheirus*, in both of which species have cheliceral seta *b* clearly acuminate.

It should be noted that Chamberlin's statement (1924, p. 89) that the seminal receptacles (=spermathecae) of *Hesperochnes* species are like those of *Chernes* species is confusing, because of Chamberlin's imperfect understanding of *Chernes* at that time. Actually, the spermathecae of members of *Hesperochnes* and *Chernes* are similar in consisting of long, thin tubules, but in the former the ends are greatly expanded while in the latter the ends are very little if any larger than the tubules themselves.

While females of *Hesperochnes* and *Chernes* can easily be separated on the basis of the spermathecae, the males are not distinguishable by means of their genitalia because the details of these structures are not yet understood. It is to be hoped that further work along the lines of Legg (1971) will result in the recognition of male genital characters which will be useful in the taxonomy of chernetid genera.

#### *Hesperochnes laurae* Chamberlin

Figs. 5-10.

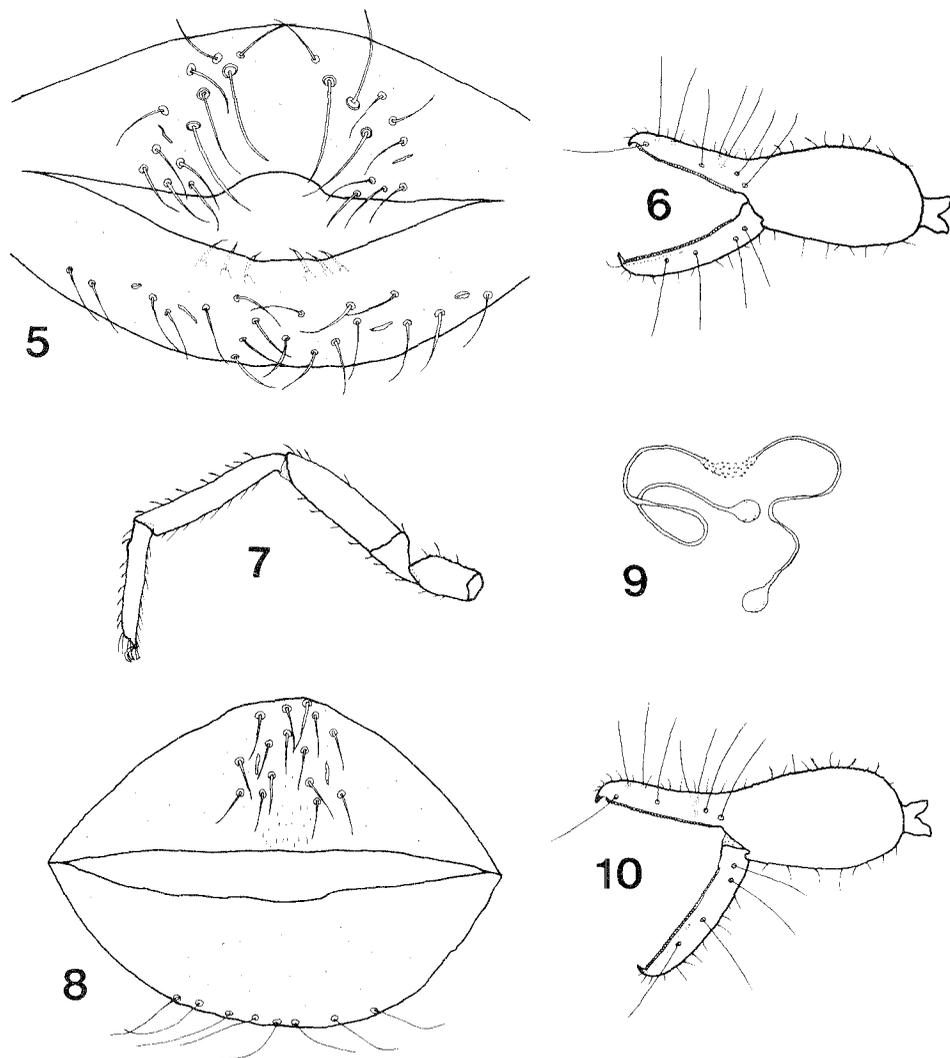
*Hesperochnes laurae* Chamberlin, 1924, p. 90, Figs. A-L. 1931, Figs. 12D, 13A, 51G, 52I.

**Material examined**—Holotype male (JC 530.01001), allotype female and four paratypes (three males, one female) all from a nest of the wasp, *Vespa occidentalis*, at Stanford University, San Mateo County, California [J. C. Chamberlin Collection].

**Description of male**—The original description by Chamberlin (1924, p. 90) is generally satisfactory but a few additions and measurements are desirable (figures given are for the holotype or ranges for the four types). Carapace longer than broad, with two distinct transverse furrows; surface granulate; no eyes present; about 70 vestitural setae, four at anterior and nine along posterior margin. Tergites 1-10 and sternites 4-10 divided. Tergal chaetotaxy 9:9:8:11:11:12:12:10:11:11:8:2; sternal chaetotaxy 22:(3)<sup>3</sup>/<sub>19</sub>(2):(1)7(1):12:15:12:11:10:9:6:2; eleventh tergite and sternite without acuminate tactile setae; setae of anal plates acuminate; anterior genital operculum with six long setae flanked by 16 smaller ones (Fig. 5); posterior genital operculum with two sets of three small setae beneath anterior margin and 19 setae scattered over face and along posterior margin; setae of spiracular plates acuminate.

Chelicera one-third as long as carapace; hand with five setae, *sb* terminally denticulate, *b* very finely denticulate terminally, *es* shorter than *b* and acuminate; flagellum of four setae, distal one dentate along margin, others variably denticulate terminally; galea usually with six small rami.

Palp essentially as figured by Chamberlin (1924, Figs. A, B). Trochanter 1.7-1.8, tibia 3.2-3.3, femur 2.6-2.7, and chela (without pedicel) 2.9-3.2 times as long as broad; hand



Figs. 5-10.—*Hesperochnes laurae* Chamberlin: 5, genital opercula of male; 6, lateral view of left chela of male; 7, leg IV; 8, genital opercula of female; 9, spermathecae of female; 10, lateral view of left chela of female.

(without pedicel) 1.55-1.7 times as long as deep. movable finger 0.95-1.0 times as long as hand. Lateral view of chela shown in Fig. 6. Fixed chelal finger with 37-40 and movable finger with 41-44 contiguous marginal teeth; each finger with 2-4 external and internal accessory teeth. Venom apparatus well developed only in movable finger, nodus ramosus nearer to *st* than to *t*.

Legs fairly slender; leg IV with entire femur 4.55-4.75 and tibia 5.9-6.0 times as long as deep (Fig. 7). Each tarsus with a prominent slit sensillum at basal quarter of outer margin. Leg IV without an acuminate tactile seta on tarsus.

**Female**—Much like male but very slightly larger and more robust. Anterior genital operculum with central group of about 15 setae, posterior operculum with row of nine setae along posterior margin (Fig. 8). Spermathecae paired, each consisting of a long, thin

tubule with an ovoid terminal enlargement (Fig. 9). Palpal trochanter 1.8-1.9, tibia 3.0-3.1, femur 2.3-2.5, and chela (without pedicel) 2.8-2.95 times as long as broad; hand (without pedicel) 1.5-1.65 times as long as deep; movable finger 1.0-1.03 times as long as hand. Lateral view of chela as shown in Fig. 10. Fixed finger with 40-41 and movable finger with 46-47 marginal teeth. Leg IV with femur 4.45-4.5 and tibia 5.85-5.9 times as long as deep; tarsus without an acuminate tactile seta.

**Measurements** (mm)—Ranges for the four males are given first, followed in parentheses by those of the two females. Body length 2.09-2.26(2.67-2.74). Carapace length 0.74-0.755(0.77-0.815). Chelicera 0.245-0.25(0.26) by 0.12-0.125(0.13). Palpal trochanter 0.385-0.41(0.415-0.45) by 0.215-0.245(0.23-0.235); femur 0.66-0.76(0.71-0.725) by 0.20-0.23(0.235); tibia 0.60-0.68(0.66-0.665) by 0.22-0.25(0.265-0.29); chela (without pedicel) 0.985-1.08(1.08-1.095) by 0.33-0.355(0.37-0.385); hand (without pedicel) 0.525-0.56(0.555) by 0.33-0.34(0.34-0.37); pedicel about 0.09 long; movable finger 0.525-0.54(0.555-0.57) long. Leg IV: entire femur 0.59-0.62(0.635-0.67) long; basifemur 0.185-0.21(0.22-0.23) by 0.125-0.13(0.14); telofemur 0.43-0.445(0.465-0.47) by 0.13(0.14-0.15); tibia 0.53-0.54(0.555-0.56) by 0.09(0.095); tarsus 0.39-0.43(0.43-0.435) by 0.06-0.065(0.065).

On the basis of adequate original descriptions or reexamination by the present author, it is clear that the following belong to the genus *Hesperoernes* as defined above: *Hesperoernes laurae* Chamberlin, 1924, p. 90; *H. tamiae* Beier, 1930, p. 214; *H. utahensis* Hoff and Clawson, 1952, p. 15; *H. riograndensis* Hoff and Clawson, 1952, p. 19; *H. mimulus* Chamberlin, 1952, p. 292; *H. molestus* Hoff, 1956, p. 33; *Chelififer mirabilis* Banks, 1895; *Pseudozaona occidentalis* Hoff and Bolsterli, 1956.

*Hesperoernes mirabilis* (Banks), new combination

*Chelififer mirabilis* Banks, 1895, p. 4. *Chelodamus mirabilis*: R. V. Chamberlin, 1925, p. 237. *Parachelifer mirabilis*: Beier, 1932, p. 241. *Pseudozaona mirabilis*: Hoff, 1946b, p. 201; Hoff, 1958, p. 24.

After careful reexamination of the types and study of much additional material from numerous caves in southeastern United States, I have concluded that *Chelififer mirabilis* Banks actually belongs to the genus *Hesperoernes*. The species possesses all of the characters of that genus as defined above, notably; lack of an acuminate tactile seta on the tarsus of leg IV; cheliceral seta *b* and *sb* both denticulate terminally; spermathecae of female in form of long, thin tubules with conspicuous, ovoid terminal enlargements; trichobothrium *st* closer to *t* than to *sb*, and *ist* distinctly distad of *est*, which is near middle of finger. There appears to be no basis for placing the species in another genus except for its large size and the attenuation of palps and legs, which are, however, only modifications for its cavernicolous existence. Contrary to the view of Hoff (1946b), it is not congeneric with *Pseudozaona communis* Beier (which, as a matter of fact, belongs in yet another genus) as will be shown in detail in a subsequent paper.

*Hesperoernes occidentalis* (Hoff and Bolsterli), new combination.

*Pseudozaona occidentalis* Hoff and Bolsterli, 1956, p. 170; Hoff, 1958, p. 24.

This species, as shown by Hoff and Bolsterli, is quite similar to *H. mirabilis* (Banks). Like the latter, it possesses the characters diagnostic of *Hesperoernes* species,

and is modified for cave dwelling by its increased size and attenuated appendages.

Reexamination of the types of the following species by the present author has revealed that they do not belong in *Hesperochnes*, but apparently are representatives of the genus *Chernes* Menge as will be discussed fully in a subsequent paper: *Chernes sanborni* Hagen, 1869 (see Hoff, 1946a, p. 100); *Reginachernes ewingi* Hoff, 1949, p. 466; *R. lymphatus* Hoff, 1949, p. 467; *Hesperochnes amoenus* Hoff, 1963, p. 3.

The status of the following species is still in doubt inasmuch as the descriptions in the literature do not allow firm decisions and the types have not yet been reexamined: *Chelanops pallipes* Banks, 1893 (see Hoff, 1947, p. 506); *C. unicolor* Banks, 1908 (see Hoff, 1947, p. 511); *C. paludis* Moles, 1914 (see Hoff, 1958, p. 24); *Hesperochnes montanus* Chamberlin, 1935, p. 37; *H. canadensis* Hoff, 1945, p. 1; *H. thomomysi* Hoff, 1948, p. 341.

#### Genus *Dinocheirus* Chamberlin

*Dinocheirus* Chamberlin, 1929, p. 171. Beier, 1932, p. 137. Chamberlin, 1934, p. 128. Hoff, 1947, p. 513. Hoff, 1949, p. 471. Hoff, 1956, p. 43. Hoff, 1958, p. 47. *Epaphochnes* Beier, 1932, p. 173.

**Type species**—*Dinocheirus tenoch* Chamberlin, 1929.

**Diagnosis** (emended)—A genus of the family Chernetidae. Usually heavily sclerotized and darkly colored; surfaces of carapace, abdominal sclerites and palps generally granulate; pleural membranes longitudinally rugose; vestitural setae of dorsal surfaces clavo-dentate or strongly denticulate, those of ventral surfaces finely denticulate or acuminate; setae of genital opercula and spiracular plates acuminate; eleventh tergite with two and eleventh sternite with four, long, acuminate, tactile (?) setae; carapace with two distinct transverse furrows; no eyes present or two faint eyespots; cheliceral hand with five setae, all acuminate except *sb* which is terminally denticulate; flagellum of four setae, including two long ones distally and two short ones lying very close together proximally, the distalmost seta heavily dentate along margin, the others often finely denticulate near tips; galea with several lateral rami, usually better developed in female than in male; palps rather robust, palpal chela of male usually larger and stouter (often markedly) than that of female; venom apparatus well developed in movable chelal finger, vestigial or apparently absent in fixed finger; both chelal fingers with conspicuous accessory teeth, externally and internally; trichobothrium *st* of movable finger closer to *t* than to *sb* and near middle of finger; trichobothrium *ist* of fixed finger a little distad of *est*, both near middle of finger; tarsus of each leg with an elevated slit sensillum on extensor margin within basal quarter of segment; tarsus III and IV each with prominent, acuminate tactile seta located distad of midpoint of extensor margin; male anterior genital operculum with a more or less compact group of 20-50 or more setae, including 4-12 longer and heavier ones medially, and posterior operculum with 2-4 small setae on either side beneath middle of anterior margin and 20-40 larger setae on face and along posterior margin; female anterior genital operculum with a more or less compact group of about 20-30 setae of equal lengths, and posterior operculum with a single marginal row of about 10-20 smaller setae; female with paired spermathecae in form of long, thin tubules with conspicuous spheroid or ovoid terminal enlargements.

**Remarks**—The species of *Dinocheirus* are moderately variable in their special morphology. There is usually a sexual dimorphism, often marked, in the size and proportions of the palps in a given species, and the palps of different species show a wide range

of form, evidently associated with their different modes of life (about which we know very little).

*Dinocheirus tenoch* Chamberlin

Figs. 11-16.

*Dinocheirus tenoch* Chamberlin, 1929, p. 172. Chamberlin, 1931, Figs. 16H, 16P, 18K, 18L, 20H, 30H, 30I. Chamberlin, 1934, Figs. G and M.

**Material Examined**—Holotype male (JC 320.01001), allotype female and four paratypes (two males and two females) from litter in a garden in Mexico City, Mexico [J. C. Chamberlin Collection].

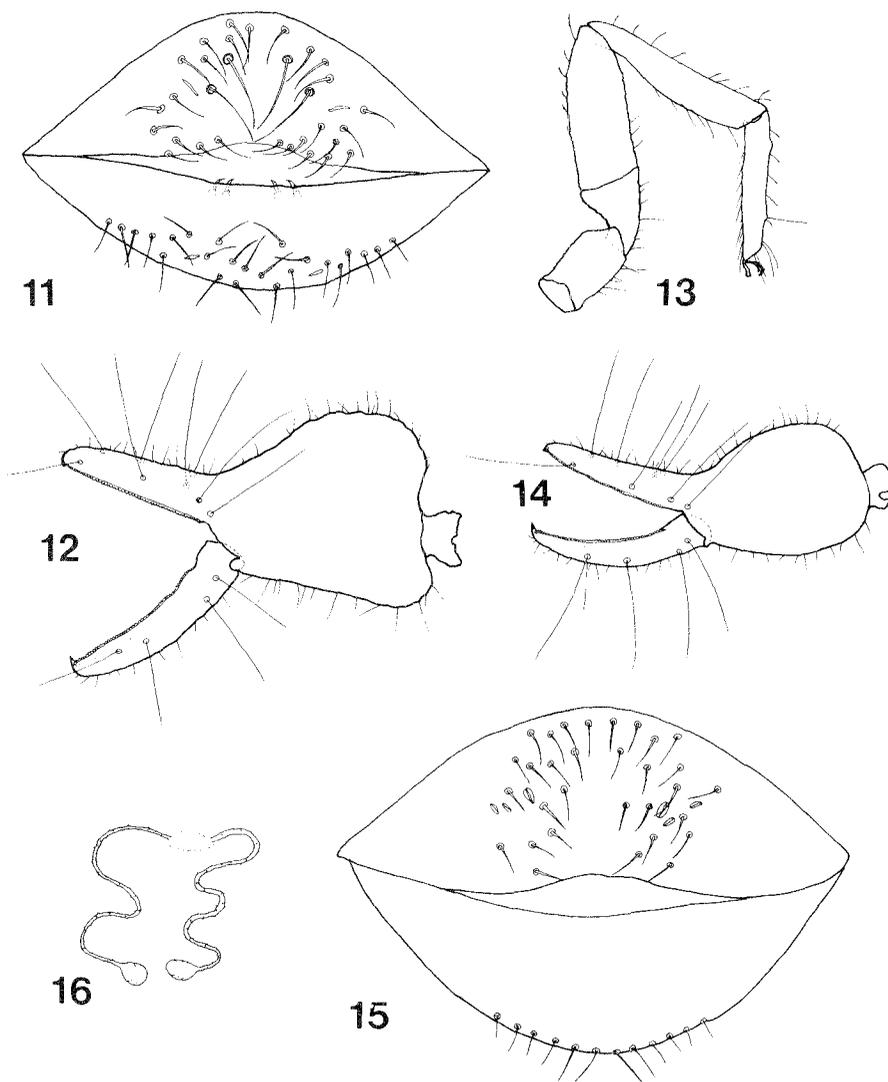
**Description of Male**—The original description by Chamberlin (1929, p. 172) together with the supplementary information included in Chamberlin (1934, p. 128) is generally satisfactory, but a few additions and measurements are necessary. (Figures given are for the holotype or ranges for the three types.) Carapace longer than broad and with two distinct transverse furrows; surface heavily granulate; with two very faint eye spots; about 100 vestitural setae in all, four at anterior margin and 12-14 at posterior margin. Tergites 1-10 and sternites 4-10 divided; tergal chaetotaxy 14:16:16:19:18:18:18:16:19:16:T9T:2; sternal chaetotaxy 32:(3) $\frac{2}{22}$ (3):(1)17(1):27:29:26:27:20:18:T1TT2T:2; anterior genital operculum with four large setae flanked by 28 smaller ones (Fig. 11); posterior operculum with two sets of two small setae beneath anterior margin and 22 setae scattered on face; setae of spiracular plates and anal plates acuminate.

Chelicera about one-third as long as carapace; hand with five setae, *sb* terminally dentate, *b* and *es* acuminate, *es* shorter than *b*; flagellum of four setae, distal one denticulate along margin, others subterminally; galea short, with 3-4 small subterminal denticulations (see Chamberlin, 1931, Fig. 18K).

Palp essentially as figured by Chamberlin (1931, Fig. 30I); trochanter 1.5-1.6, femur 2.65-2.75, tibia 2.2-2.25, and chela (without pedicel) 2.05-2.1 times as long as broad; hand (without pedicel) 0.90-1.1 times as long as deep; movable finger 0.96-0.99 as long as hand. Lateral view of chela shown in Fig. 12. Fixed chelal finger with 44-48 and movable finger with 49-51 marginal teeth; fixed finger with 7-8 external and 6-7 internal accessory teeth, and movable finger with 4-7 external and 7-8 internal accessory teeth; venom apparatus well developed only in movable finger, nodus ramosus about midway between trichobothria *t* and *st*.

Legs moderately slender; leg IV with entire femur 3.5-3.9 and tibia 4.85-5.0 times as long as deep (Fig. 13). Each tarsus with an elevated slit sensillum in basal quarter of outer margin. Leg IV with rather short, acuminate tactile seta on tarsus 0.64-0.69 length of segment from proximal end.

**Female** (allotype and two paratypes)—Generally similar to male but slightly smaller and less robust, especially in proportions of palp (see Chamberlin, 1931, Figs. 30H and 30I). Palpal trochanter 1.6-1.8, femur 2.55-2.7, tibia 2.15-2.4, and chela (without pedicel) 2.45-2.65 times as long as broad; hand (without pedicel) 1.25-1.45 times as long as deep; movable finger 1.01-1.07 times as long as hand. Lateral view of chela shown in Fig. 14; fixed finger with 44-45 and movable finger with 45-46 marginal teeth. Leg IV with femur 3.55-3.8 and tibia 5.0-5.25 times as long as deep, and with short tactile seta on tarsus 0.66-0.69 length of segment from proximal end. Anterior genital operculum of allotype with group of 29 setae on face; posterior operculum with row of 12 small setae along



Figs. 11-16.—*Dinocheirus tenoch* Chamberlin: 11, genital opercula of male; 12, lateral view of left chela of male; 13, leg IV; 14, lateral view of left chela of female; 15, genital opercula of female; 16, spermathecae of female.

posterior margin (Fig. 15). Spermathecae paired, each consisting of a long, thin tubule with a wrinkled, ovoid, terminal enlargement (Fig. 16).

**Measurement** (mm)—Ranges for the three males given first, followed in parentheses by those for the three females. Body length 2.89-2.99(3.48-3.56). Carapace length 1.04-1.05(1.00-1.07). Chelicera 0.355-0.38(0.34-0.355) by 0.17-0.19(0.155-0.185). Palpal trochanter 0.56-0.58(0.52-0.53) by 0.355-0.39(0.295-0.325); femur 0.96-0.985(0.84-0.895) by 0.355-0.37(0.32-0.33); tibia 0.895-0.90(0.755-0.79) by 0.40-0.41(0.33-0.35); chela (without pedicel) 1.48-1.59(1.33-1.41) by 0.725-0.755(0.52-0.58); hand (without pedicel) 0.815-0.84(0.69-0.725) by 0.74-0.90(0.50-0.57); pedicel about 0.14(0.125) long; movable finger

0.78-0.83(0.70-0.77) long. Leg IV: entire femur 0.85-0.89(0.80-0.85) long; basifemur 0.325-0.33(0.30-0.32) by 0.215-0.23(0.185-0.22); telofemur 0.605-0.635(0.56-0.605) by 0.23-0.245(0.21-0.23); tibia 0.725-0.75(0.65-0.71) by 0.15(0.13-0.14); tarsus 0.55-0.585(0.495-0.54) by 0.09-0.095(0.09-0.095).

On the basis of adequate original descriptions or reexamination by the present author it can now be stated with confidence that the following American species do belong to the genus *Dinocheirus* as defined above: *Dinocheirus tenoch* Chamberlin, 1929, p. 172; *Chelanops pallidus* Banks, 1890 (see Hoff, 1949, p. 272); *C. dorsalis* Banks, 1895 (see Hoff, 1947, p. 523); *C. validus* Banks, 1895 (see Hoff, 1947, p. 526); *C. arizonensis* Banks, 1901 (see Hoff, 1946b, p. 200); *Dinocheirus sicarius* Chamberlin, 1952, p. 279; *D. astutus* Hoff, 1956, p. 44; *D. imperiosus* Hoff, 1956, p. 54; *D. horricus* Nelson and Manley, 1972, p. 217.

Reexamination of the types of *Chelanops tristis* Banks (1891) and *Chelanops tumidus* Banks (1895), which were placed in *Dinocheirus* by Hoff (1947) (and see Weygoldt, 1966), reveals that they actually belong in quite a different genus, which will be described and discussed in a subsequent paper.

There is still some uncertainty about the following, which have been assigned to *Dinocheirus* by other authors but have not been reexamined by me: *Chelanops aequalis* Banks, 1908 (see Hoff, 1947, p. 520); *C. obesus* Banks, 1909 (see Hoff, 1947, p. 517); *C. partitus* Banks, 1909 (see Hoff, 1947, p. 514); *C. serratus* Moles, 1914 (see Hoff, 1958, p. 28); *Dinocheirus solus* Hoff, 1949, p. 474; *D. texanus* Hoff and Clawson, 1952, p. 27; *D. venustus* Hoff and Clawson, 1952, p. 31; *D. athleticus* Hoff, 1956, p. 48.

No attempt has yet been made to examine the validity of the many species of *Dinocheirus* described from Central and South America. However, it can be predicted that many will be found to be properly assigned while others will have to be placed in other genera.

It is also apparent that the genus *Dinocheirus* is represented in Europe as well as in the Americas.

*Dinocheirus bowieri* (Vachon), new combination

*Epaphocheernes bowieri* Vachon, 1936, p. 141.

It is perfectly clear from the original description and the figure of the spermathecae (Vachon, 1938, p. 99) that this species belongs in *Dinocheirus* as here defined. If further study should prove that this species is indeed the same as *Chelifera anachoreta* Simon as Beier indicates (1963, p. 257), then further action will be necessary.

Finally, there is strong presumption that some species presently assigned to *Toxochernes* also belong here (at least, some specimens considered to represent *T. panzeri* may be diagnosed as belonging to *Dinocheirus*). Resolution of this problem will depend upon much further study, including reexamination of the types of species assigned to *Toxochernes*.

## SUMMARY

Members of the chernetid genera *Chernes*, *Hesperochernes*, and *Dinocheirus* are closely related and are quite varied. As a result it is often difficult to identify material

from these genera, especially if only a single individual is available in a collection. The following key usually allows proper placement into the genera, though incomplete, improperly prepared, or (occasionally) aberrant specimens may still give trouble.

The three genera belong to the Chernetidae and the species have as common characters: four setae in the cheliceral flagellum; cheliceral seta *sb* denticulate; on movable chelal finger, trichobothrium *st* closer to *t* than to *sb*; on fixed chelal finger, trichobothrium *ist* distad of *est*; no unusual protuberances on palpal chela; no setae unusual in being strongly expanded or feather-like; spermathecae of female paired, long, looped tubules. They can be distinguished as follows:

- 1a. Fourth tarsus with an acuminate tactile seta distal to midpoint of segment . . . . . *Dinocheirus*
- 1b. Fourth tarsus without an acuminate tactile seta . . . . . 2
- 2a. Setae *b* and *sb* of cheliceral hand both usually denticulate; spermathecae of female terminally expanded . . . . . *Hesperochnes*
- 2b. Seta *sb* of cheliceral hand denticulate, *b* acuminate; spermathecae of female not terminally expanded . . . . . *Chernes*

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