

## REDEFINITION OF THE GENUS *OLPIOLUM* AND DESCRIPTION OF A NEW GENUS *BANKSOLPIUM* (PSEUDOSCORPIONIDA, OLPIIDAE)

**William B. Muchmore**

Department of Biology  
University of Rochester  
Rochester, New York 14627

### ABSTRACT

The genus *Olpiolum* Beier is redefined on the basis of a redescription of the type species, *Olpiolum medium* Beier. *O. elegans* (Balzan) is retained in the genus, but all other species previously assigned there are removed. *Olpiolum modestum* Banks, redescribed, serves as the type species of the new genus *Banksolpium*, and a new species, *B. magnum*, is added to the genus.

### INTRODUCTION

In 1931 the genus *Olpiolum* was established by Beier, with the new species *Olpiolum medium* as the type species. Since then, a dozen other species have been placed in the genus. However, many of these have differed in significant ways from the original diagnosis and the genus has been (both implicitly and explicitly) emended several times (Beier 1954, 1959, Hoff 1964). As a result of these and other considerations, the distinction between *Olpiolum* and *Pachyolpium* Beier (1931) has been difficult to maintain (Hoff 1964, Mahnert and Schuster 1981, Heurtault and Rebière 1983).

In an attempt to fix the definitions of and distinguish clearly between the genera *Olpiolum* and *Pachyolpium*, I have examined and redescribed the types of the type species of the two. The present paper deals with *Olpiolum*; *Pachyolpium* will be treated in another place.

Species which have been assigned to *Olpiolum* are as follows:

- O. medium* Beier 1931; Paraguay
- O. elegans* (Balzan 1890), Beier 1932; Paraguay
- O. modestum* (Banks 1909)?, Beier 1932; Brazil
- O. peruanum* Beier 1959; Peru
- O. crassum* Beier 1959; Peru
- O. aureum* (Hoff 1945), Hoff 1964; Puerto Rico
- O. puertoricensis* (Hoff 1945), Hoff 1965; Puerto Rico
- O. confundens* (Hoff 1945), Hoff 1964; Puerto Rico
- O. monae* Hoff 1964; Mona Is., Puerto Rico
- O. amplum* Hoff 1964; Jamaica
- O. paucisetosum* Muchmore 1977; Yucatan, Mexico

*O. fuscipalpus* Muchmore 1977; Belize

*O. machadoi* Heurtault 1980; Venezuela

Of these, *O. medium* and *O. elegans* actually belong in the genus as redefined below, *O. modestum* forms the basis for the establishment of a new genus, and the others belong elsewhere.

### Genus *Olpiolum* Beier

*Olpiolum* Beier, 1931:312, 1932:196; Hoff 1964:19.

**Type species.**—*Olpiolum medium* Beier, 1931.

**Description.**—Beier's original description of the genus is as follows (1931:312):

Cephalothorax länger als breit, glatt, mit 4 Augen. Tergite ungeteilt, mit je 4-6 kleinen Borsten. Palpen mässig kräftig. Femur dorsal nahe der Basis mit einem Tasthaar. Giftkanal der Palpenfinger kurz. Apodem des beweglichen Fingers klein. Das Tasthaar *est* etwas proximal der Mitte gelegen, *it* etwas vor *est*, *ist* proximal von *est*, jedoch nicht an der Fingerbasis. Patella des 1. Beinpaars kürzer als das Femur, gegen dieses frei beweglich. Arolien einfach.

In *Das Tierreich* (1932:196), Beier changed this slightly, to read:

Cephalothorax deutlich länger als breit, ohne Quereindrücke, mit vier grossen, nahe beisammen stehenden Augen. Tergite ungeteilt, die vorderen mit je 4, die mittleren mit je 6 Marginalborsten. Palpen mässig kräftig. Femur mit einem Tasthaar dorsal nahe der Basis. Giftkanal der Palpenfinger kurz. Apodem des beweglichen Fingers klein. Patella des 1. Beinpaars kürzer als das Femur, gegen dieses beweglich. Arolien einfach. Das Tasthaar *it* etwas vor *est*, letzteres etwas proximal der Mitte gelegen; *ist* zwischen *it* und der Fingerbasis.

These are essentially correct, but several features require better definition or amplification.

Namely, a genus with the basic characters of the family Olpiidae, subfamily Olpiinae, and tribe Olpiini (cf. Hoff 1964). The 4 eyes large, with bulging corneas, as is common in Olpiinae. Setae on tergites very small and inconspicuous, as are most other vestitural setae on animal. Palps moderately robust for an olpiin (cf. Beier 1932:Fig. 228; present paper: Figs. 2 and 3). Tactile seta on dorsum of palpal femur about  $\frac{1}{4}$  length of femur from proximal end. Venom ducts in chelal fingers quite short; nodus ramosus in fixed finger distad of trichobothrium *et*, while that in movable finger less than half distance from finger tip to trichobothrium *t*. Trichobothrium *est* slightly proximad of middle of fixed finger; *it* only slight distance distad of *est*; *ist* about midway between *est* and *isb*, or a little closer to *isb*. On movable finger *sb* a little closer to *b* than to *st*. Basifemur (femur) of leg I about 1.5 times as long as telofemur (patella). Arolia of pedal tarsi simple, longer than claws. And in addition: Cheliceral flagellum of 3 setae. All surfaces of palpal segments entirely smooth. Chaetotaxy of metatarsus of leg IV, in terminology of Heurtault (1983:594), 2 dorsal, 2 ventral, 3 lateral external (including a long tactile seta proximally), 7 lateral internal (or T+2-2-7-2 in my abbreviated notation).

In brief, *Olpiolum* can be distinguished from all other genera of the Olpiini by the location of both trichobothria *est* and *it* near the middle of the fixed chelal finger, the very short venom ducts in the chelal fingers, the occurrence of only 6 setae on the middle tergites, and a single tactile seta on the palpal femur.

**Remarks.**—According to our present knowledge, *Olpiolum* must be considered a small genus with only two species restricted to Paraguay, though, certainly, future collections will extend its distribution. So, too, its systematic relationships

will become better understood when more is learned about the South American Olpiidae.

While I do not believe that the chaetotaxy of the metatarsus (basitarsus) of leg IV is important at the generic level (cf. Mahnert 1982:298), I have included the numbers here for comparison with Heurtault and Rebière's figures for *Olpiolum* and *Pachyolpium* (1983:594). A more fruitful discussion of this subject can occur later, in reference to *Pachyolpium*, for which very many specimens are available to demonstrate intra- and interspecific variations.

*Olpiolum medium* Beier

Figs. 1-5

*Olpiolum medium* Beier, 1931:312, Fig. 8 [erroneously labelled *Apolpium medium*]; 1932:197, Fig. 228.

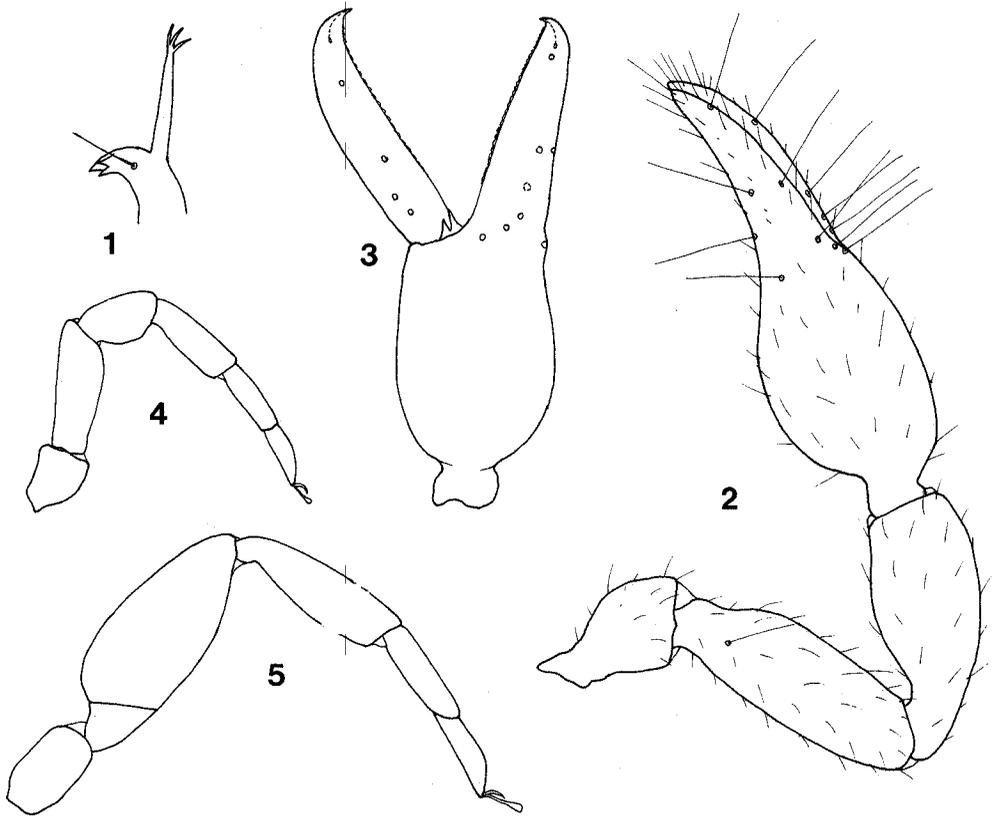
**Material.**—Female lectotype (here designated) and 3 paralectotypes (1 male, 2 tritonymphs) from "Paraguay, unter Holz und Laub, 18.7, K. Fiebrig, Nr. 672"; all labelled syntypes, Nr. 27113, in the Museum für Naturkunde an der Universität zu Berlin. The lectotype has been cleared and mounted on a microscope slide and examined; the paralectotype male was examined in glycerine.

**Description.**—The description by Beier is sketchy, but generally accurate. However, I give here a complete description based mainly on the mounted lectotype female. The paralectotype male is a little larger than the lectotype. Carapace and palps light brown, other parts lighter. Carapace a little longer than broad, without transverse furrows; anterior margin slightly indented at center; with 4 large, corneate eyes; surface mostly smooth, but with few reticulations laterally and posteriorly; setae short and thin, difficult to count accurately, but apparently with 6 across anterior margin and 4 at posterior margin. Abdominal tergites and sternites undivided; tergites with 4-6 small, thin setae; setae of sternites impossible to count accurately. Cribriform plates not visible.

Chelicera 2/5 as long as carapace; hand with 5 long, acuminate setae; flagellum of 3 setae (1 long, 2 short), all finely denticulate; subapical lobe of movable finger prominent and bifurcate (Fig. 1); galea long, slender, with 3 small terminal rami (Fig. 1); lamina exterior present.

Palp rather heavy, with femur and tibia about equal in length (Fig. 2); all surfaces smooth. Femur 3.0, tibia 2.5, and chela (without pedicel) 2.9 times as long as broad; hand (without pedicel) 1.5 times as long as deep; movable finger 1.03 times as long as hand. Femur with a conspicuous tactile seta on dorsum about ¼ length from proximal end. Trichobothria on chela as shown in Fig. 3: *est* and *it* at about same level near middle of fixed finger, *eb*, *esb*, *ib* and *isb* in a group at base of finger, *ist* midway between *est* and *isb*; on movable finger *sb* closer to *b* than to *st*. Venom apparatus well developed in both fingers, venom ducts short; nodus ramosus in fixed finger distad of trichobothrium *et*, in movable finger less than half distance from tip to *t*. Fixed finger with 30 marginal teeth, the distal ones cusped, the proximal ones low and flat; movable finger with 26 similar teeth.

Legs moderately robust. Leg I with basifemur about 1.5 times as long as telofemur (Fig. 4). Leg IV with entire femur 2.7 and tibia 3.5 times as long as



Figs. 1-5.—*Olpiolum medium* Beier, lectotype female: 1, end of movable finger of chelicera; 2, dorsal view of right palp, 3, lateral view of left chela; 4, lateral view of leg I; 5, lateral view of leg IV.

deep (Fig. 5). Chaetotaxy of metatarsus IV: T+2-2-7-2, tactile seta (T) very close to proximal end. Arolia longer than claws, not divided.

**Measurements (mm).**—Figures given first for lectotype female, followed in parentheses by those for paralectotype male. Body length 1.96 (1.52). Carapace length 0.48(0.49). Chelicera 0.20(0.21) by 0.11(0.105). Palpal trochanter 0.245(0.26) by 0.13(0.14); femur 0.40(0.43) by 0.13(0.15); tibia 0.40(0.445) by 0.16(0.185); chela (without pedicel) 0.665(0.76) by 0.23(0.26); hand (without pedicel) 0.34(0.36) by 0.23(0.26); pedicel 0.06 (0.065) long; movable finger 0.35(0.37) long. Leg I: basifemur 0.19(0.215) by 0.065(0.07); telofemur 0.125(0.14) by 0.065(0.075). Leg IV: entire femur 0.38(0.39) by 0.145(0.16); tibia 0.27 by 0.08; metatarsus 0.155 by 0.05; telotarsus 0.13 by 0.04.

**Remarks.**—The measurements given above are slightly different from those given by Beier (1931:313). This may be due to differences in our methods of measuring or may be the result of Beier's mistaken assumption that all 4 individuals were adults.

#### *Olpiolum elegans* (Balzan)

*Olpiolum elegans* Balzan, 1890:437, Pl.16, Figs. 19, 19a, 19b.; 1891:549; Ellingsen 1910:390; Beier 1930:207.

*Olpiolum elegans* (Balzan), Beier 1931:313; 1932:196, Fig. 227; Feio 1945:4; Hoff 1964:20.

*O. elegans* and *O. medium* seem very similar, with only slight differences in size and proportions (cf. Beier 1931:313). Indeed, the types of *O. medium* are apparently specimens which were identified as *Olpiolum elegans* by Ellingsen (1910) and Beier (1930). Study of additional material may well prove the two to be synonymous.

The type locality of this species is Rio Apa, Paraguay. Feio (1945) has also recorded collections in Brazil and Argentina, but his identifications may not be correct.

*Olpiolum modestum* Banks (1909) was referred tentatively to *Olpiolum* by Beier (1932:197). Reexamination of the types of this species reveals that it belongs in another genus, heretofore unrecognized.

### *Banksolpium*, new genus

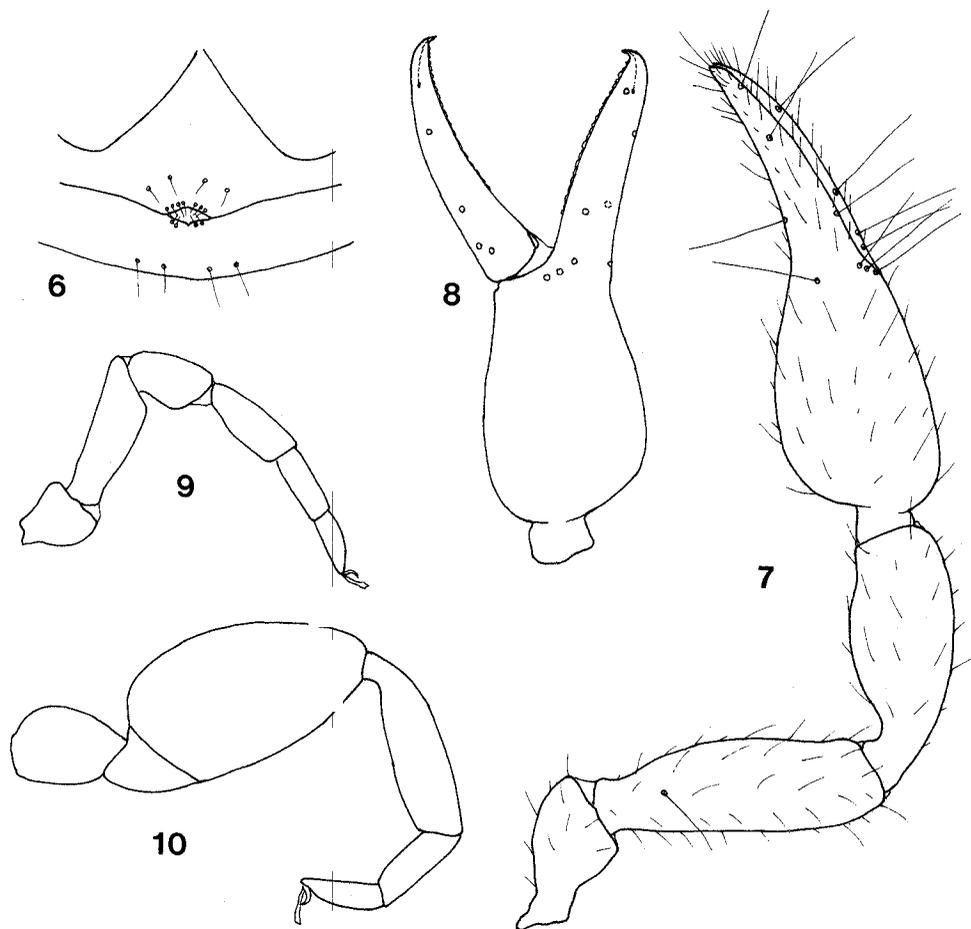
**Type species.**—*Olpiolum modestum* Banks, 1909.

**Etymology.**—The genus is named in honor of Nathan Banks, an early, great pioneer in the study of American pseudoscorpions and other arachnids.

**Diagnosis.**—A member of the family Olpiidae, subfamily Olpiinae, and tribe Olpiini (cf. Hoff 1964), with relatively heavy palps, venom duct in fixed finger of palpal chela reaching just to level of trichobothrium *et*, trichobothrium *ist* lying distad of *est*, one tactile seta on palpal femur proximally, and cheliceral flagellum of 3 setae.

**Description.**—Generally robust. Carapace and palps well sclerotized and darker than other parts. Carapace longer than broad; anterior margin slightly indented at middle; surface smooth, without transverse furrows; 4 large corneate eyes; 30-40 vestitural setae, with 4 at anterior and 4 at posterior margins. Abdominal tergites and sternites entire, smooth; pleural membranes longitudinally striate; setae short and slender; middle tergites with 6-12 setae; anterior genital operculum of male with 11-12 setae in 2 transverse rows, that of female with about 4 setae in a single row; internal genitalia not obviously distinctive. Chelicera about one-third as long as carapace; hand with 5 long setae; flagellum of 3 setae (1 large, 2 small); subapical lobe of movable finger distinct; galea with 3 terminal rami, smaller in male than in female. Palps moderately robust for an olpiin, femur and tibia about equal in length and hand (without pedicel) and movable finger about equal in length (Figs. 7 and 8). All surfaces smooth. Femur with conspicuous tactile seta in proximal third of dorsum. Chela with venom ducts short, the nodus ramosus lying at or just proximad of trichobothrium *et* in fixed finger and about midway between *t* and finger tip in movable finger. Trichobothria on fixed chelal finger generally as in olpiins, but with *ist* lying distad of *est*; on movable finger, *st* much closer to *b* than to *st*. Both fingers with contiguous marginal teeth, well developed and cusped distally, but becoming lower and rounded proximally. Legs rather robust, with entire femur 2.2-2.6 times as long as deep. Leg I with basifemur 1.6-1.8 times as long as telofemur. Arolia of pedal tarsi simple and longer than claws.

**Remarks.**—*Banksolpium* can easily be distinguished from other genera of the Olpiini by the placement of the trichobothria on the fixed finger of the chela, notably the location of *ist* distad of *est*. The genus is presently known to include only 2 species from eastern and southeastern Brazil.



Figs. 6-10.—*Banksolpium modestum* (Banks), lectotype male: 6, genital opercula; 7, dorsal view of right palp; 8, lateral view of left chela; 9, lateral view of leg I; 10, lateral view of leg IV.

*Banksolpium modestum* (Banks), new combination

Figs. 6-10

*Olpium modestum* Banks, 1909:148, no fig.

*Olpiolum(?) modestum* (Banks), Beier 1932:197.

*Olpiolum modestum* (Banks), Hoff 1964:20; Heurtault 1980:71; *not* Beier 1954:134, Fig. 3.

**Material.**—Lectotype male (WM 4534.01003) (here designated) and 2 paralectotype females from Pernambuco, Brazil, in the Museum of Comparative Zoology, Harvard University; all specimens have been cleared, dissected, mounted on slides, and examined.

**Description.**—The original description by Banks is very short and general and not accompanied by illustrations. Therefore, a complete description is presented here. Male and female similar. Moderately robust for an olpiin. Carapace and palps well sclerotized and darker than other parts. Vestitural setae small and fine. Carapace longer than broad; smooth and without transverse furrows; anterior margin nearly straight or slightly indented at middle; 4 large, corneate eyes; about 30 setae, 4 at anterior and 4 at posterior margins. Abdominal tergites and sternites entire, surfaces smooth; pleural membranes longitudinally striate. Tergal

chaetotaxy of lectotype 2:4:4:4:6:6:6:6:10:10:?:2; paralectotypes similar but with 6 setae on tergite 4. Sternal chaetotaxy of male 11:[2-2]:(0)4(0):(0)6(0):6:-, that of females 4:(0)4(0):(0)6(0):6:-; anterior genital operculum of male with setae in 2 transverse rows (Fig. 6), that of female with setae in 1 row. Internal genitalia not distinguishable.

Chelicera one-third as long as carapace; hand with 5 long setae; flagellum of 3 setae (1 long, 2 short), all finely denticulate; subapical lobe of movable finger distinct and finely incised at tip; galea long, with 3 terminal rami, smaller in male than in female; lamina exterior present.

Palp moderately heavy, with tibia slightly shorter than femur (Fig. 7); femur 3.3-3.35, tibia 2.3-2.4, and chela (without pedicel) 2.75-3.0 times as long as broad; hand (without pedicel) 1.45-1.64 times as long as deep; movable finger 1.0-1.05 times as long as hand. All surfaces smooth. Femur with conspicuous tactile seta on dorsum about  $\frac{1}{4}$  length from proximal end. Trichobothria on chela as shown in Fig. 8: on fixed finger *it* nearer to *et* than to *est*, *ist* distad of *est*, and *eb*, *esb*, *ib* and *isb* in a group at base; on movable finger *sb* much closer to *b* than to *st*. In one paralectotype there is an extra trichobothrium on the external surface midway between *et* and *it*. Venom apparatus well developed in both fingers, ducts short; nodus ramosus in fixed finger at level of trichobothrium *et*, in movable finger about half distance from tip to *t*. Fixed finger with 29-33 marginal teeth, the distal ones cusped, the proximal ones very low and flat; movable finger with 20-22 similar teeth.

Legs robust; leg IV with entire femur 2.15-2.25 and tibia 3.5-3.7 times as long as deep (Fig. 10). Leg I with basifemur about 1.65 times as long as telofemur (Fig. 9). Chaetotaxy of metatarsus IV of lectotype T+1-2-8-2, tactile seta (T) close to proximal end; others T+1-2-7-2 and T+1-3-7-2. Arolia longer than claws, not divided.

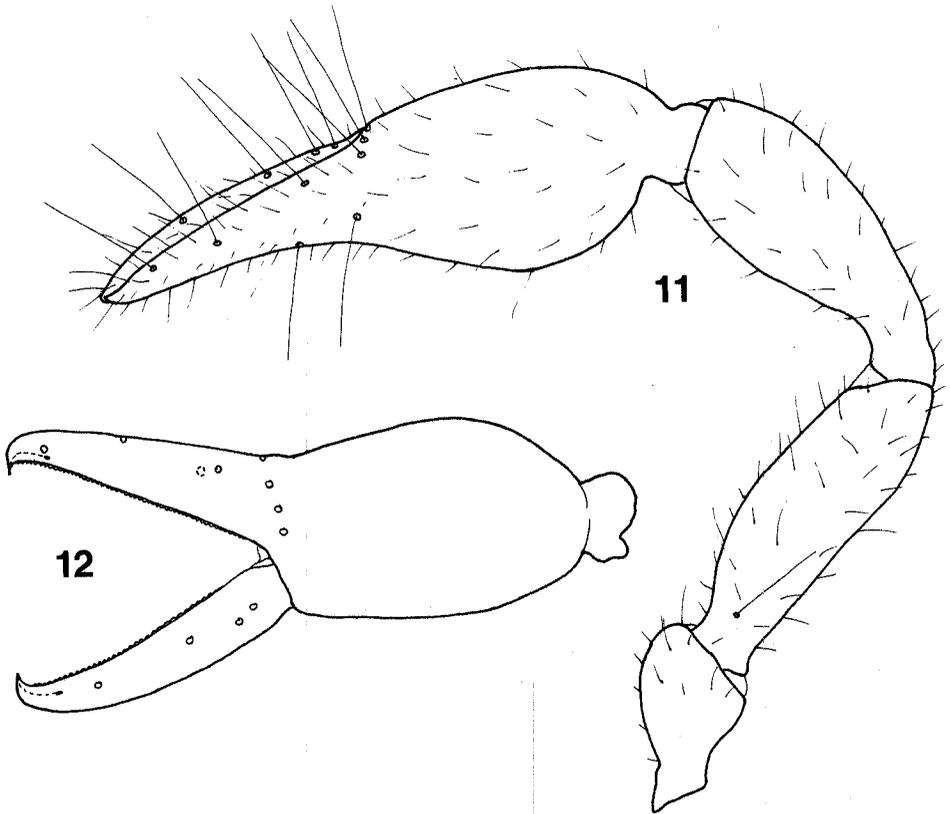
**Measurements (mm).**—Figures given first for the lectotype male, followed in parentheses by those for the two paralectotype females. Body length 2.0(2.1,2.25). Carapace length 0.59(0.59,0.62). Chelicera 0.19(0.20,0.19) long. Palpal trochanter 0.26(0.27,0.27) by 0.14(0.14,0.16); femur 0.50 (0.51,0.51) by 0.15(0.155,0.155); tibia 0.42(0.45,0.45) by 0.175(0.19,0.195); chela (without pedicel) 0.755(0.81,0.82) by 0.25(0.28,0.30); hand (without pedicel) 0.39(0.42,0.44) by 0.265(0.25,0.30); pedicel 0.070(0.075) long; movable finger 0.41(0.44,0.43) long. Leg I: basifemur 0.235 (0.245,0.245) by 0.07(0.09,0.08); telofemur 0.14(0.155,0.15) by 0.08(0.08,0.09). Leg IV: entire femur 0.48(0.50,0.49) by 0.22(0.23,0.22); tibia 0.32(0.33,0.34) by 0.09(0.09,0.095); metatarsus 0.16(0.18,0.18) by 0.06 (0.06,0.06); telotarsus 0.13(0.13,0.13) by 0.04(0.04,0.04).

**Remarks.**—As pointed out by Heurtault (1980:71-72), the specimen from Venezuela described by Beier (1954) as *Olpiolum modestum* (Banks) is actually referable to *Olpiolum machadoi* Heurtault. Importantly, the trichobothriotaxy of the palpal chela and the numbers of setae on the abdominal tergites preclude its being *B. modestum*.

### *Banksolpium magnum*, new species

Figs. 11 and 12

**Material.**—Holotype male (WM 612.03001) from Viçosa, Minas Gerais, Brazil, 6 July 1933, in Cornell University Insect Collection.



Figs. 11 and 12.—*Banksolpium magnum*, new species, holotype male: 11, dorsal view of right palp; 12, lateral view of left chela.

**Diagnosis.**—Much like *B. modestum* but larger (carapace length 0.835 vs. 0.59) and with more setae on carapace (40 vs. 30) and on abdominal tergites (5:6:9:11:- vs. 2:4:4:4:-).

**Description of male (female unknown).**—A large species of the genus *Banksolpium* as presently known. Carapace, palps, and posterior tergites well sclerotized and reddish brown in color, other parts lighter. Vestitural setae generally thin and short. Carapace a little longer than broad; smooth and without transverse furrows; anterior margin straight; 4 large, corneate eyes; about 40 setae, 4 at anterior and 4 at posterior margins. Abdominal tergites and sternites entire, smooth; pleural membranes finely, longitudinally striate. Tergal chaetotaxy 5:6:9:11:10:12:12:12:12:12:6:2. Sternal chaetotaxy 12:[2-2]:(0)6(0):(0)8(0):12:13:14:13:13:12:4:2; disposition of setae on genital opercula much as in *B. modestum*. Internal genitalia not obviously distinctive.

Chelicera 0.4 as long as carapace; hand with 5 long setae; flagellum of 3 setae, all denticulate; subapical lobe of movable finger distinct, entire; galea slender, with 3 small rami; lamina exterior present.

Palp moderately heavy, with tibia slightly longer than femur (Fig. 11); femur 3.1, tibia 2.75, and chela (without pedicel) 3.1 times as long as broad; hand (without pedicel) 1.7 times as long as deep; movable finger 0.92 as long as hand. All surfaces smooth. Femur with tactile seta about one-fifth length from proximal end. Trichobothria on chela as shown in Fig. 12: on fixed finger *est* closer to

*isb* than to *it*, and *ist* distad of *est*; on movable finger *sb* much closer to *b* than to *st*. Venom apparatus well developed in both chelal fingers, ducts short; nodus ramosus in fixed finger just proximad of trichobothrium *et*, in movable finger about midway between *t* and finger tip. Fixed finger with 46 contiguous teeth, nearly all cusped; movable finger with 39 teeth, cusped in distal half but becoming rounded and flattened proximally.

Legs more slender than in *B. modestum*; leg IV with entire femur 2.65 and tibia 4.15 times as long as deep. Leg I with basifemur about 1.85 times as long as telofemur. Chaetotaxy of metatarsus IV is T+2-3-8-3. Arolia longer than claws, not divided.

**Measurements (mm).**—Body length 2.57. Carapace length 0.835. Chelicera 0.33 by 0.17. Palpal trochanter 0.415 by 0.235; femur 0.77 by 0.25; tibia 0.82 by 0.30; chela (without pedicel) 1.33 by 0.43; hand (without pedicel) 0.725 by 0.43; pedicel 0.105 long; movable finger 0.665 long. Leg I: basifemur 0.40 by 0.125; telofemur 0.215 by 0.125. Leg IV: entire femur 0.72 by 0.27; tibia 0.54 by 0.13; metatarsus 0.325 by 0.09; telotarsus 0.265 by 0.065.

**Etymology.**—The species is named *magnum* in reference to its being larger than *B. modestum*.

**Remarks.**—The type locality in southeastern Brazil is some 1500 km from the type locality of *B. modestum* on the eastern bulge of the country, indicating a broad distribution of the genus. However, thus far no other congeneric species are known.

#### ACKNOWLEDGMENTS

I am much indebted to the following for the loan of material: H. W. Levi of the Museum of Comparative Zoology, M. Moritz of the Museum für Naturkunde in Berlin, and L. L. Pechuman of the Cornell University Insect Collection.

#### LITERATURE CITED

- Balzan, L. 1890. Revisione dei pseudoscorpioni del bacino dei fiumi Parana e Paraguay nell'America meridionale. Ann. Mus. Civ. Stor. Nat. Genova, (2):401-454.
- Balzan, L. 1891. Voyage de M. E. Simon au Venezuela (Décembre 1887-Avril 1888). 16e mémoire. Arachnides. Chernetes (Pseudoscorpiones). Ann. Soc. Entomol. France, 60:497-552.
- Banks, N. 1909. New tropical pseudoscorpions. J. New York Entomol. Soc., 17:145-148.
- Beier, M. 1930. Die Pseudoskorpione des Wiener Naturhistorischen Museums. III. Ann. naturhistor. Mus. Wien, 44:199-222.
- Beier, M. 1931. Neue Pseudoscorpione der U. O. Neobisiinae. Mitt. Zool. Mus. Berlin, 17:299-318.
- Beier, M. 1932. Pseudoscorpionidea I. Subord. Chthoniinae et Neobisiinae. Tierreich, 57:1-258.
- Beier, M. 1954. Pseudoscorpionidea. Beitr. Fauna Perus, 4:1-12.
- Beier, M. 1959. Zur Kenntnis der Pseudoscorpioniden-Fauna des Andengebietes. Beitr. neotrop. Fauna, 1:185-228.
- Ellingsen, E. 1910 Die Pseudoskorpione des Berliner Museums, Mitt. Zool. Mus. Berlin, 4:355-423.
- Feio, J. L. A. 1945. Novos pseudoscorpiones da região neotropical (com a descrição de uma subfamília, dois géneros e sete espécies). Bol. Mus. Nac., Rio de Janeiro, (N.S., Zool.), 44:1-47.
- Heurtault, J. 1980. Le développement postembryonnaire chez deux espèces nouvelles de pseudoscorpions Olpiinae du Venezuela. Rev. Nordest. Biol., 3:57-85.
- Heurtault, J. and J. Rebière. 1983. Pseudoscorpions des Petites Antilles I. Chernetidae, Olpiidae, Neobisiidae, Syarinidae. Bull. Mus. Natn. Hist. Nat., 5(A):591-609.
- Hoff, C. C. 1945. The pseudoscorpion subfamily Olpiinae. Amer. Mus. Novitates, 1291:1-30.

- Hoff, C. C. 1964. The pseudoscorpions of Jamaica. part 3. The suborder Diplosphyronida. Bull. Inst. Jamaica, Sci. Ser. 10(3):1-47.
- Mahnert, V. 1982. Die Pseudoskorpione (Arachnida) Kenyas. 3. Olinidae. Monitore Zool. Ital. (N. S.) Suppl. 16:263-304.
- Mahnert, V. and R. Schuster. 1981. *Pachyolpium atlanticum* n. sp., ein Pseudoskorpion aus der Gezeitenzone der Bermudas — Morphologie und Ökologie (Pseudoscorpiones: Olinidae). Rev. suisse Zool., 88:265-273.
- Muchmore, W. B. 1977. Preliminary list of the pseudoscorpions of the Yucatan Peninsula and adjacent regions, with descriptions of some new species (Arachnida: Pseudoscorpionida). Assoc. Mexican Cave Stud. Bull., 6:63-78.

*Manuscript received September 1985, revised November 1985.*