

# OCCASIONAL PAPERS

## THE MUSEUM

### TEXAS TECH UNIVERSITY

---

NUMBER 69

3 OCTOBER 1980

---

#### TWO NEW HADRUIDES POCOCK, FROM PERU (SCORPIONES, VAEJOVIDAE)

OSCAR F. FRANCKE AND MICHAEL E. SOLEGLAD

The scorpion family Vaejovidae Thorell until recently was thought to be represented by four genera in the Neotropical region (Mello-Leitão, 1945; Stahnke, 1974). However, the monotypic genus *Physoctonus* Mello-Leitão, from Brasil is a junior synonym of the buthid *Rhopalurus* Thorell (Francke, 1977), and *Uroctonoides* Chamberlin, from Ecuador is a junior synonym of the chactid *Teuthraustes* Simon (Soleglad, 1973). The monotypic genus *Metascorpiops* Toledo, recently described from Brasil (Toledo, 1972), appears to have been placed incorrectly in the Vaejovidae. The largely inadequate description suggests that it is based on a scorpionid of the subfamily Ischnurinae (pedipalp chela finger distally with two rows of granules fusing on basal one-half), and probably will prove to be a junior synonym of *Opisthacanthus* Peters. In the Neotropical region, therefore, the Vaejovidae is restricted now to the subfamily Caraboctoninae Kraepelin with two genera, *Caraboctonus* Pocock, monotypic from central Chile, and *Hadruides* Pocock, polytypic from Ecuador and Perú. In a recent revision of the genus *Hadruides*, Maury (1975) included Colombia (although he questioned the occurrence of *Hadruides* there), Chile, and Bolivia within its distribution but listed no specimens examined from the first two countries. The specimen from Bolivia probably is mislabelled. We examined approximately 450 specimens from various collections, and none came from countries other than Ecuador (including the Galapagos Islands) and Perú.

Maury (1975) summarized the taxonomic confusion that surrounded *Hadruides* for most of this century, which largely resulted from scientists overlooking Pocock's (1900) work on the genus. O. F. Francke has collected scorpions in Perú since 1969, and, using Pocock's work, identified in 1974 a new species of *Hadruides* from the inter-Andean valleys of south-central Perú. Unfortunately, the find was made after Maury's work had gone to press, and the new taxon could not be included in his revision of the genus. Subsequently, in 1976, a second new species was collected in the arid western foothills of the Andes. These two new taxa, described below, bring the number of species in the genus to seven.

In the accounts that follow, repositories for type material and specimens examined are referred to in the text by institutional or personal acronyms: OFF, personal collection of O. F. Francke; AMNH, American Museum of Natural History, New York; DAV, Departamento de Animales Venenosos, Ministerio de Salud Pública, Lima, Perú. All measurements of specimens reported herein are in millimeters and information on elevation in meters.

*Hadruides aguilar*, new species

(Figs. 1, 3-20)

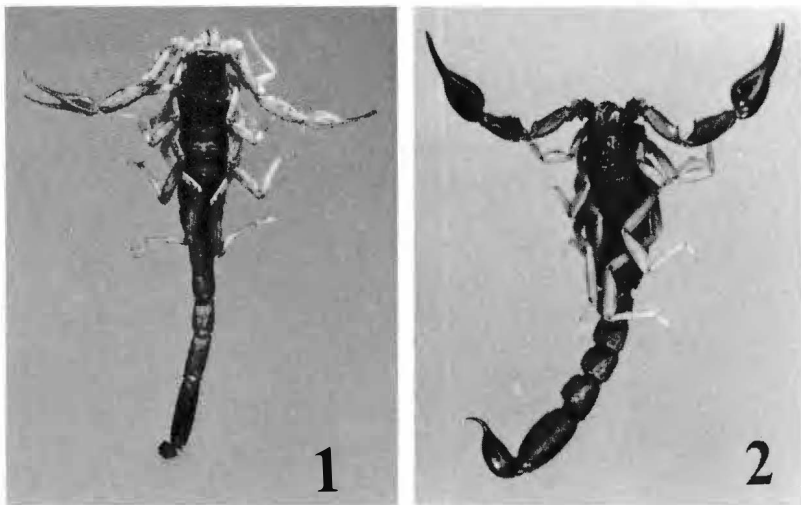
*Diagnosis.*—Adults 30-35 mm. in total length, with relatively slender appendages. Pale orange brown with dark variegations. Pectinal tooth counts 20 on males, 15-18 on females. Sternite VII essentially without keels; lateral keels present as single granule. Metasomal segment I as long as wide on males, slightly wider than long on females; segments II-V longer than wide. Ventral submedian keels on metasomal segments I-IV absent; ventrolateral keels vestigial to obsolete, smooth. Metasoma V with dorsolateral carinae rounded, irregularly crenulate to serrate. Pedipalp tibia with dorsal exterior keel quite rounded, vestigial to obsolete. Pedipalp chela slender, smooth; fingers without proximal scallops.

*Type data.*—Holotype adult male and two adult female paratypes from Cajamarquilla, Departamento de Lima, Perú, 3 January 1976 (O. F. Francke); AMNH, New York.

*Distribution.*—Known only from the type locality.

*Etymology.*—Patronym for Dr. Pedro G. Aguilar, Escuela de Biología, Universidad Nacional Agraria, La Molina, Lima, Perú.

*Description.*—Measurements of holotype male and paratype female in Table 1. The following description is based on the male (Fig. 1); parenthetical statements refer to females.



FIGS. 1-2.—New species of scorpion from Perú: 1, *Hadruides aguilari*, dorsal view of holotype male; 2, *Hadruides mauryi*, dorsal view of holotype male.

**Coloration.** Base color of carapace, tergites, pedipalps, and metasoma pale orange brown; legs and chelicerae yellow orange; pectines and sternites yellow; telson with vesicle orange, aculeus brown. Heavily patterned with dark brown markings on carapace, existing as four irregular stripes on tergites; mottled patterns on femora, patellae, and tibiae of legs. Carinae of pedipalps pigmented dark brown on dorsoexternal aspects. Pedipalp chelal palm distally with dusky pattern. Setae pairs along obsolete ventral submedian keels of metasoma outlined with subtle brown pigment. Fifth metasomal segment darkly pigmented with brown mottled patterns, heaviest on posterior aspect. Cheliceral fingers with subtle brown dusky patterns.

**Prosoma.** Carapace slightly emarginate medially, with anterior submargin strongly convex (Fig. 3). Interocular area rough (smooth), essentially devoid of conspicuous granulation; lateral and posterior areas of carapace sparsely granulate (smooth). Genital operculi completely separate. Genital papillae present (absent). Sternum subpentagonal.

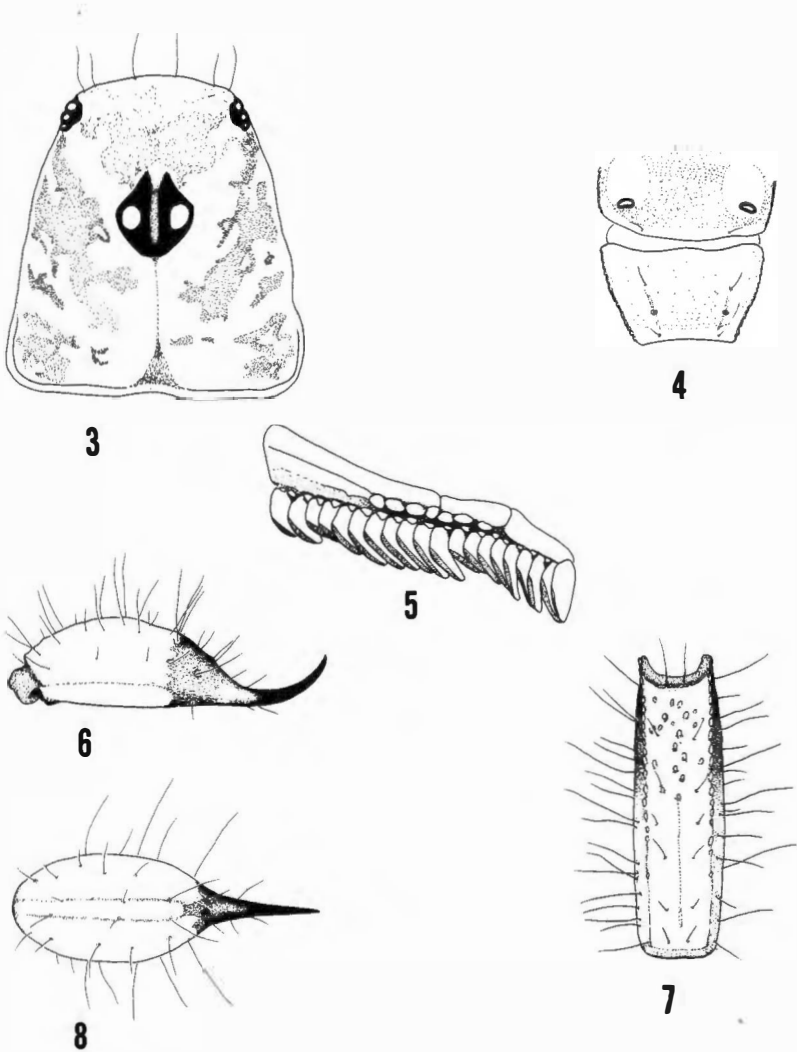
**Mesosoma.** Tergites I-VI rough but essentially devoid of conspicuous granulation; posterior one-half of each tergite with minute scattered granulation. Tergite VII with two pairs of serrate keels; median intercarinal area smooth, laterals with scattered granulation. Sternites appear smooth under low magnification, rough under medium magnification (40X). Stigmata small, oval

TABLE 1.—Measurements (in millimeters) of *Hadruroides aguilar*, n. sp., and *Hadruroides mauri*, n. sp., both from Perú. L, length; W, width; D, depth.

Character	<i>H. aguilar</i>		<i>H. mauri</i>	
	Holotype male	Paratype female	Holotype male	Paratype female
Total L	30.40	33.55	40.70	45.00
Carapace L	4.10	4.80	6.70	6.30
Mesosoma L	10.70	11.80	11.30	15.50
Metasoma L	15.60	16.95	22.70	21.20
I L/W/D	2.00/2.00/1.70	2.20/2.40/2.00	2.80/4.30/3.40	2.60/4.10/3.30
II L/W/D	2.30/1.85/1.50	2.55/2.10/1.75	3.20/4.00/3.30	3.00/3.70/3.10
III L/W/D	2.60/1.80/1.50	2.80/2.00/1.70	3.50/4.00/3.30	3.20/3.60/3.10
IV L/W/D	3.60/1.60/1.50	3.90/1.85/1.70	5.20/3.90/3.60	4.80/3.50/3.20
V L/W/D	5.10/1.60/1.50	5.50/1.90/1.80	8.00/3.80/3.30	7.60/3.45/3.10
Telson L	5.00	4.90	8.80	7.90
Vesicle L/W/D	3.10/1.85/1.60	3.00/1.90/1.50	6.00/3.55/2.85	5.00/3.20/2.50
Aculeus L	1.90	1.90	2.80	2.90
Pedipalp L	14.70	16.00	22.70	21.20
Femur L/D	3.80/1.00	4.10/1.20	5.70/1.90	5.10/1.90
Tibia L/D	4.40/1.40	4.80/1.55	6.30/2.80	6.10/2.50
Chela L	6.50	7.10	10.70	10.00
Palm L/W/D	2.50/1.55/1.40	2.60/1.70/1.50	4.80/3.95/3.60	4.10/3.10/3.00
Movable finger L	4.10	4.60	6.50	6.30
Fixed finger L	3.70	3.80	5.20	4.90
Sternum L/W	0.95/1.10	1.00/1.25	1.30/1.80	1.30/1.60
Pectinal teeth	20/20	18/17	19/	15/17
Middle lamellae	7/8	8/8	5/	6/6

to slit-like (Fig. 4): Sternite VII lacking submedian keels, each lateral keel represented by a small granule (Fig. 4). Basal pectinal piece with small anterior indentation. Pectines (Fig. 5) with 7-8 middle lamellae (6-8), 20 teeth (15-18).

Metasoma. Generally slender, I as long as wide (slightly wider than long), II-V longer than wide. Dorsolateral carinae on I-IV moderately strong, crenulate to serrate. Lateral suprmedian carinae on I-III moderate, crenulate to serrate; on IV rough to smooth. Lateral infrmedian keels on I complete, crenulate to serrate; on II vestigial to obsolete; on III-IV obsolete. Ventrolateral keels obsolete on I, vestigial to obsolete on II-IV; setation pattern 2:3:3:5. Ventral submedian keels obsolete on I-IV. Intercarinal spaces generally smooth except for slight traces of small granules dorsally and laterally on I-II. Segment V with dorsolateral keels rounded, irregularly crenulate to serrate; lateral median keels absent; ventrolateral keels smooth on basal one-fourth, serrate on distal three-fourths; ventral median keel smooth on basal one-half, serrate distally; ventral intercarinae with scattered granules distally (Fig. 7). Telson with vesicle smooth except for slight granulation on ventral aspect of base (Figs. 6, 8).



FIGS. 3-8.—*Hadruroides aguilaris*, new species, holotype male: 3, carapace; 4, sternites VI-VII showing stigmata and lateral keels; 5, left pectine; 6, lateral aspect of telson; 7, ventral aspect of metasomal segment V; 8, ventral aspect of telson.

**Chelicera.** Typical of genus; movable finger dorsally with two small subdistal teeth, ventrally with one large tooth. Serrulae absent.

**Pedipalps.** All segments relatively elongate. Femur with dorsointernal, dorsoexternal, and ventrointernal keels strong, serrate to crenulate; ventroexternal keel smooth, rounded; dorsal and



exterior faces smooth, ventral face with small scattered granules basally, internal face with medium to large scattered granules. Tibia with dorsoexternal and ventroexternal keels rounded, smooth; dorsointernal keel weakly crenulate; ventrointernal keel crenulate to serrate; all faces essentially smooth except for scattered granulation on internal aspect. Chela with carinae obsolete, palm smooth and rounded. Chelal finger dentition typical of genus; movable finger with seven interrupted rows of granules medially, fixed finger with six; supernumerary denticles sparse. Movable finger as long as carapace, shorter than metasoma V. Fingers with proximal scallops vestigial (obsolete), barely distinguishable when fingers closed. Trichobothrial pattern typical of genus (Figs. 9-20).

Legs. Tarsus with approximately 10 setal brushes ventrally, excluding *v*-shaped clump apically (surrounding unguicular spine).

*Comparisons.*—*Hadruioides aguilari* appears most closely related to *Hadruioides lunatus* (Koch), with which it occurs sympatrically, on the basis of sternite VII and metasomal carinal development and will key to this taxon in Maury's (1975) paper. These two species can be separated easily because *H. lunatus* has metasomal segments I-III wider than long, telson with vesicle moderately granulose, and finger of pedipalp chelae with moderate scallops on adult males.

*Comments.*—The type locality of *H. aguilari* was visited by O.F. Francke in the company of Dr. P. G. Aguilar, Ms. J. A. Turkowsky, and Dr. O. Meneses, while the former two were conducting an ecological study in that area. A detailed description of the area, its climate, flora, and a list of invertebrates collected in pit-fall traps is given by Aguilar and Turkowsky (1977).

The scorpions were collected on a rocky hillside (450-550 m.) with 5 to 15° SE exposure and clay soil. Vegetation consisted primarily of bromeliads (*Tillandsia* spp.), which grew in large mats (up to 3 m. in largest dimension) and the roots of which did not penetrate the soil more than a few centimeters. Afternoon collecting included overturning rocks and bromeliad mats; such effort produced three adult and three immature *H. lunatus*. Searching with a blacklight during the evening, however, resulted in the capture of the three specimens of *H. aguilari*. In each case, the scorpion was found resting on top of a bromeliad mat, whereas *H. lunatus* was found on the ground in proximity to the mats. Over the years more than 100 *H. lunatus* have been collected

under bromeliad mats, but not one *H. aguilar* has been reported in this microhabitat. The presence of *H. aguilar* on top of the mats, along with its overall more slender and elongate appearance, leads us to believe that this species is adapted to life among the bracts of the bromeliads rather than under the mats.

*Specimens examined* (3).—Male holotype (AMNH) and two female paratypes (OFF) from: PERU: *Departamento de Lima*: Cajamarquilla.

*Hadruroides mauryi*, new species

(Figs. 2, 21-38)

*Diagnosis*.—Adults 40-50 mm. in total length. Adults dark brown in appearance with no apparent patterns; immatures with dark variegations. Pectinal tooth counts on males 19-20, females 15-18. Sternite VII submedian carinae obsolete; lateral carinae moderate, present as irregular series of granules. Metasomal segments I-III wider than long. Ventral submedian keels of metasomal segments I-IV essentially obsolete; ventrolateral keels moderate, crenulate to serrate on I, smooth to crenulate on II-III. Lateral inframedian keels present, or partially present, and serrate on I-IV. Metasoma V with dorsolateral keels heavily serrate; ventral aspect covered with large serrate granules. Pedipalp tibia with dorsoexternal keel moderately strong, smooth. Pedipalp chela devoid of conspicuous granulation; proximal scallops of fingers well developed on males, subtle on females.

*Type data*.—Holotype adult male from Paruro, Departamento de Cuzco, Perú, 28 October 1966 (A. Guerra); AMNH, New York.

*Distribution*.—Known only from the inter-Andean valleys of south-central Perú at elevations of 2700-3000 m.

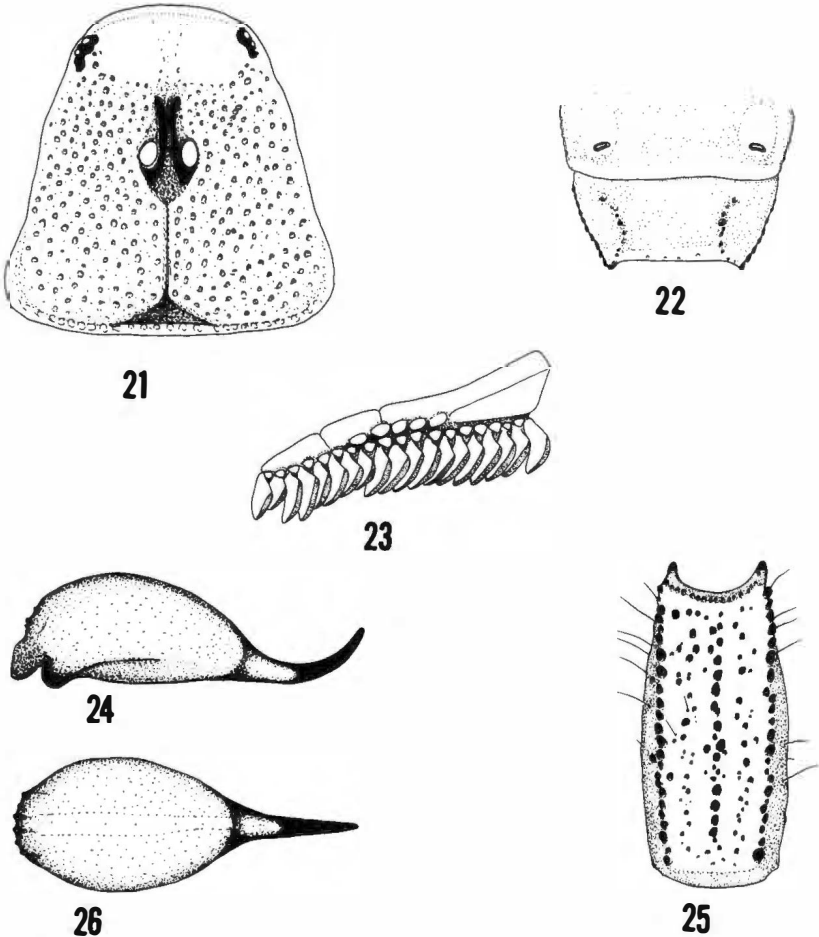
*Etymology*.—Patronym for Dr. Emilio A. Maury, Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina.

*Description*.—Measurements of holotype male and paratype female in Table 1. The following description is based on the adult holotype male (Fig. 2); parenthetical statements refer to adult females.

*Coloration*. Base color of carapace, tergites, chelae, and telson chestnut brown; legs and chelicerae yellow. Pedipalp femora and tibiae, metasoma, and sternites orange brown. Carinae of pedipalp femora and tibiae outlined in dark brown; metasomal keels outlined in dark brown to red.

*Prosoma*. Carapace slightly emarginate medially, with anterior submargin strongly convex, typical of genus (Fig. 21). Anterior one-half of interocular triangle devoid of large granulation, poste-





FIGS. 21-26.—*Hadruroides mauryi*, new species, holotype male: 21, carapace; 22, sternites VI-VII showing stigmata and lateral keels; 23, right pectine; 24, lateral aspect of telson; 25, ventral aspect of metasomal segment V; 26, ventral aspect of telson.

rior one-half moderately granulose; lateral and posterior areas of carapace moderately to densely granulose. Genital operculi completely separate. Genital papillae present (absent). Sternum subpentagonal.

Mesosoma. Tergites I-VI sparsely granulose on anterior one-half, moderately granulose on posterior one-half. Tergite VII with two pair of strong, serrate keels somewhat obscured by densely granulose aspect of intercarinal spaces. Sternites generally smooth

under low magnification (10 $\times$ ). Stigmata small, suboval (Fig. 22). Sternite VII submedian keels obsolete, lateral keels present as irregular series of granules (Fig. 22). Basal pectinal piece with median indentation on anterior one-third. Pectines (Fig. 23) with 7-8 middle lamellae (6-8), 19-20 teeth (15-18).

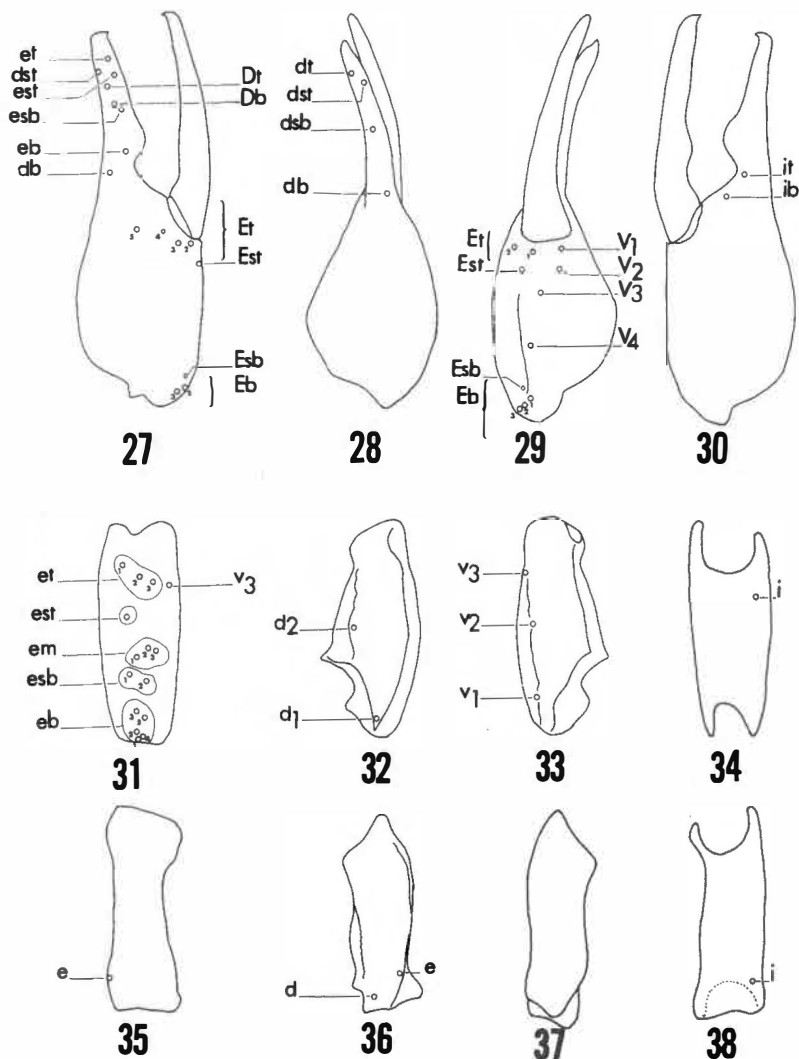
Metasoma. Segments I-III wider than long, IV-V longer than wide. Dorsolateral and lateral supramedian carinae on I-IV strong, heavily serrate. Lateral inframedian keels on I strong, complete, serrate; on II weak, present on distal two-thirds only, irregularly serrate; on III weak, present on distal one-half only, irregularly serrate to granulose; on IV weak, present on distal one-third, irregularly granulose. Ventrolateral carinae on I moderate, crenulate to serrate; on II-IV moderate, smooth to crenulate. Ventral submedian keels on I-III vestigial; on IV present as weak, irregular series of granules. Dorsal and lateral intercarinal spaces on I-III with medium granulation, decreasing posteriorly from I to III. Segment V with dorsolateral keels strong, heavily serrate; lateral median keels essentially obsolete; ventrolateral carinae strong, heavily serrate; ventral median keel moderately strong, serrate (Fig. 25); ventral intercarinae with dense granulation. Telson with vesicle globular; essentially smooth with some large granules scattered at base, and with some traces of punctations (Figs. 24, 26).

Chelicera. Typical of genus; movable finger with two small subdistal teeth, ventrally with one large tooth. Serrulae absent.

Pedipalps. Femur with dorsointernal, dorsoexternal, and ventrointernal carinae strong, outlined with large serrate granules; ventroexternal keel obsolete; dorsal and ventral faces with scattered granulation, denser on internal face. Tibia with dorsal and ventroexternal keels moderate, smooth; internal carinae strong, heavily serrate; all faces smooth except for sparse granulation on internal aspect. Chela with carinae essentially obsolete, palm smooth and rounded. Chelal finger dentition typical of genus, supernumerary denticles abundant. Movable finger shorter than carapace and metasoma V. Fingers with proximal scallops well developed (subtle). Trichobothrial pattern typical of genus (Figs. 27-38).

Legs. Tarsus with about 10-13 setal brushes ventrally, excluding *v*-shaped clump apically.

*Variation.*—Immature specimens with distinctive coloration: carapace variegated with dark brown; tergites with four somewhat solid longitudinal dark stripes; sternite VII and metasomal seg-



FIGS. 27-38.—*Hadruroides mauryi*, new species, holotype male trichobothrial pattern: 27-30, chela; 31-34, tibia; 35-38, femur; 27, 31, 35, external aspect; 28, 32, 36, dorsal aspect; 29, 33, 37, ventral aspect; 30, 34, 38, internal aspect. Trichobothrial designations after Vachon (1974).

ments with ventral keels outlined with four light brown stripes; segment V variegated ventrally; vesicle variegated; pedipalpal carinae essentially unpigmented.

*Comparisons.*—*Hadruroides mauryi* is most similar to *Hadruroides charcasus* (Karsch), from northern Peru, because of its

robust pedipalp chelae, overall coloration, and carinal development on sternite VII and metasomal segments I-V. *H. mauryi* can be recognized easily by the absence of granulation on the pedipalp chelae, the stronger scallops on the pedipalp fingers, and denser granulation on the ventral aspect of metasoma V.

The absence of chelal granulation and the presence of two keels on sternite VII will key *H. mauryi* to *Hadruioides leopardus* Pocock (Maury, 1975). These two species, however, differ conspicuously in coloration (as implied by the name *leopardus*), and *H. leopardus* has poorly developed and smooth dorsal carinae on the pedipalp tibiae and lacks scallops on the pedipalp fingers.

*Specimens examined* (12).—PERU: *Departamento de Cuzco*: Paruro (3000 m.), 28 October 1966 (A. Guerra), holotype male (AMNH), one immature female (DAV); *Departamento de Ayacucho*: Ruinas de Huari, November 1977 (M. Francke), one subadult female, one subadult male (OFF); *Departamento de Huancavelica*: 15 km. N Anco (along Río Mantaro, 2700 m.), 25 July 1971 (O. F. Francke), 2 juvenile males, 4 adult females, 2 juvenile females (AMNH, OFF).

#### ACKNOWLEDGMENTS

We are grateful to the following curators and institutions for the loan of specimens: Dr. Pedro G. Aguilar, Escuela de Biología, Universidad Nacional Agraria, Lima, Perú; Dr. Orsetta Elter, Museo ed Istituto di Zoologia Sistemática, Università di Torino, Torino, Italia; Dr. Emilio A. Maury, Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina; Dr. Oswaldo Meneses, Departamento de Animales Venenosos, Ministerio de Salud Pública, Lima, Perú; Dr. Norman I. Platnick, American Museum of Natural History, New York, U.S.A.; Dr. Douglas Rossman, Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana, U.S.A. We also thank Mr. W. David Sissom and Mr. F. W. Wagner for their constructive comments on the manuscript. This work was supported in part by the Institute for Museum Research, Texas Tech University.

#### LITERATURE CITED

- AGUILAR, P. G., AND J. A. TURKOWSKY. 1977. Fauna desertico-costera peruana. III: Observaciones en el Tillandsial de Cajamarquilla, Lima. *Rev. Peruana Entomol.*, 20:81-85.
- FRANCKE, O. F. 1977. Two emendations to Stahnke's (1974) Vaejovidae revision (Scorpionida). *J. Arachnol.*, 4:125-135.
- MAURY, E. A. 1975. Escorpiones y escorpionismo en el Perú. IV: Revisión del género *Hadruioides* Pocock 1893 (Scorpiones, Vaejovidae). *Rev. Peruana Entomol.*, 17:9-21.

- MELLO-LEITÃO, C. DE. 1945. Escorpiões Sul-Americanos. Arq. Mus. Nac., Rio de Janeiro, 40:1-468.
- POCOCK, R. I. 1900. Some new or little-known Neotropical scorpions in the British Museum. Ann. Mag. Nat. Hist., ser. 7, 5:469-478.
- SOLEGLAD, M. E. 1973. *Uroctonoides fractus*, a synonymy (Scorpionida, Chactidae). Pan-Pacific Entomol., 49:60.
- STAHNKE, H. L. 1974. Revision and keys to the higher categories of Vejovidae (Scorpionida). J. Arachnol., 1:107-141.
- TOLEDO PIZA, S. DE. 1972. Um genero novo de escorpioes brasileiros do noroeste de Goias (Vejovidae, Scorpiopsinae). Rev. Agric., Piracicaba, Brasil, 47:27-29.
- VACHON, M. 1974. Etudes des caractères utilisés pour classer les familles et les genres de Scorpions (Arachnides). I. La trichobothriotaxie en Arachnologie. Sigles trichobothriaux et types de trichobothriotaxie chez les Scorpions. Bull. Mus. Nat. Hist. Nat., Paris, 3e. ser., 140 (Zool. 104):857-958.

Addresses of authors: O. F. FRANCKE, *Departments of Biological Sciences and Entomology, and The Museum, Texas Tech University, Lubbock, 79409*; M. E. SOLEGLAD, *1502 Dupont Drive, Lemon Grove, California 92045*. Received 23 April accepted 1 July 1980.

PUBLICATIONS OF THE MUSEUM  
TEXAS TECH UNIVERSITY

Three publications of The Museum of Texas Tech University are issued under the auspices of the Dean of the Graduate School and Director of Academic Publications, and in cooperation with the International Center for Arid and Semi-Arid Land Studies. Short research studies are published as Occasional Papers whereas longer contributions appear as Special Publications. Papers of practical application to collection management and museum operations are issued in the Museology series. All are numbered separately and published on an irregular basis.

The preferred abbreviation for citing The Museum's Occasional Papers is *Occas. Papers Mus., Texas Tech Univ.*

Institutional subscriptions are available through Texas Tech Press, Texas Tech University, Lubbock, Texas 79409. Institutional libraries interested in exchanging publications should address the Exchange Librarian at Texas Tech University. Individuals can purchase separate numbers of the Occasional Papers for \$1.00 each from Texas Tech Press. Remittance in U.S. currency check, money order, or bank draft must be enclosed with request (add \$1.00 per title or 200 pages of publications requested for foreign postage; residents of the state of Texas must pay a 5 per cent sales tax on the total purchase price). Copies of the "Revised checklist of North American mammals north of Mexico, 1979" (Jones *et al.*, 1979, *Occas. Papers Mus., Texas Tech Univ.*, 62:1-17) are available at 60 cents each in orders of 10 or more.