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## A Revision of the Spider Genus *Segestrioides* (Araneae, Diguettidae)

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### ABSTRACT

The spider genus *Segestrioides* Keyserling has remained enigmatic since it was originally described in 1883, not least because the type (and only known) specimen was lost decades ago. *Segestrioides bicolor* Keyserling is redescribed on the basis of newly collected, topotypical specimens

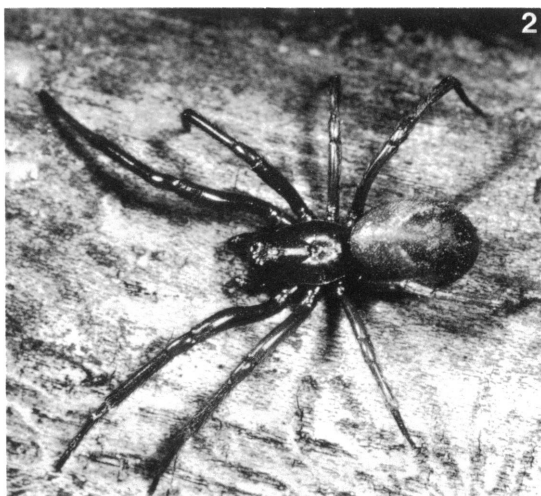
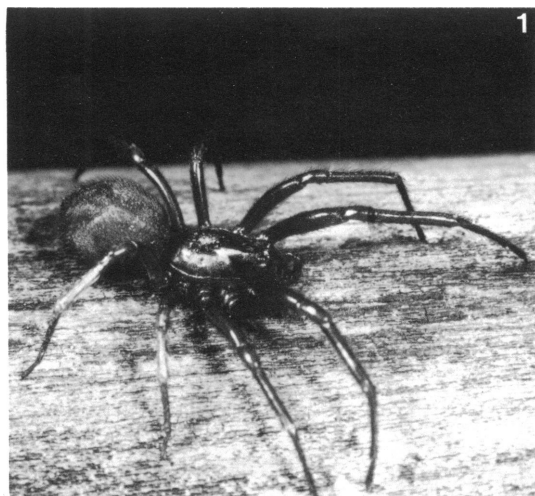
from Peru, and two additional species (*S. copiapo* and *S. tofo*), including the first known males of the genus, are described from Chile. Brignoli's suggestion that *Segestrioides* belongs to the Diguettidae rather than the Sicariidae, Scytodidae, or Segestriidae is confirmed.

### INTRODUCTION

The six-eyed, haplogyne spider genus *Segestrioides* was described by Keyserling (1883) on the basis of a single female taken at an elevation of 10,000 ft at San Mateo, Peru; Keyserling placed the genus in the family "Dysderoidea," and specifically differentiated it from both *Segestria* (now placed in the Segestriidae) and *Scytodes* (now placed in the Scytodidae). The identity and relationships of the genus have remained uncertain, however, as no subsequent arachnologists have been able to study authenticated specimens. The holotype, which was deposited in the

collection now belonging to the Polska Akademia Nauk, Warsaw, has been lost ("unfortunately it was missed about 50 years ago and nobody knows where this specimen might be now or if it is existing at all"; W. B. Jędrzycki, in litt., 17 February 1984). Simon (1893: 278) placed *Segestrioides* as a "genus invisum et incertae sedis" at the end of his (now fragmented) family Sicariidae, commenting that "C'est avec doute que je rapporte ce genre au groupe actuel." In Bonnet's (1958) catalog, the genus was retained in the Sicariidae, whereas Roewer's (1942) catalog

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Figs. 1, 2. *Segestrioides bicolor* Keyserling, female from San Mateo, Peru (photographs by J. Palmer).

placed *Segestrioides* with *Scytodes* instead. The only subsequent record of the genus in the literature is by Brignoli (1983: 150), who in his supplement to Roewer's catalog "provisionally placed" *Segestrioides* in the Diguettidae rather than Sicariidae, Scytodidae, or Segestriidae. As indicated below, Brignoli's assessment seems to be correct.

A relatively small number of spiders, collected in northern and central Chile by various workers over recent years, seemed to belong to *Segestrioides*. In the absence of authentic specimens of *Segestrioides bicolor* Keyserling (1883), however, their generic placement remained enigmatic. An opportunity to solve the problem arose early in 1988 when Dr. Frederick A. Coyle of Western Carolina University began planning fieldwork in Peru, and was able to include the type locality of *S. bicolor* in his itinerary. Experience with the Chilean taxa indicated that if the species still occurred at the type locality, specimens could probably be located by turning rocks. With the aid of a field crew including Mr. Robb Bennett, Ms. Jackie Palmer, and Mr. David Smith, Dr. Coyle succeeded in collecting a fine series of juveniles and females (figs. 1, 2) under rocks in a *Eucalyptus* forest at an elevation of 3100 m on the western edge of San Mateo. These specimens allow *Segestrioides* to be redescribed, and confirm both Brignoli's placement of the genus

in the Diguettidae and the status of the Chilean taxa as congeners.

A family-group name based on *Diguettia* Simon (1895) was first established by F. O. P.-Cambridge (1899), but was not used by Simon (1903), who included in the Sicariidae a subfamily Periegopinae containing the New Zealand genus *Periegops* Simon (1893) as well as *Diguettia* and *Pertica* Simon (1903). A group including *Diguettia* was first elevated to familial status by Gertsch (1949: 234, 266) in a popular account, and more fully justified by Gertsch (1958), who revised the species of *Diguettia*, then known only from the southwestern United States and Mexico. Gertsch's detailed study allowed Gerschman and Schiapelli (1962) to determine that the Argentine species *Segestria catamarquensis* Mello-Leitão (1941) is, surprisingly, a *Diguettia*. The placement of this species in *Diguettia* was confirmed by Brignoli (1974: figs. 2-4), who examined the internal female genitalia; the resulting disjunct distribution of the genus is similar to that of the mygalomorph spider family Mecicobothriidae, also known only from western North America and Argentina (Gertsch and Platnick, 1979).

The genus *Pertica* is known only from the holotype female of *Pertica badia* Simon (1903), from southern Brazil, which was also restudied by Brignoli (1974). Although differing somewhat from *Diguettia* in general ap-

pearance (particularly in being much less hirsute than members of that genus), *Pertica* shares with *Diguetia* its unusual, almost diamond-shaped endites (as in Gertsch, 1958: fig. 12) and a similar organization of the internal female genitalia. In *Diguetia* those genitalia consist of a wide, semicircular bursa copulatrix bearing a distinct, longitudinally oriented median receptaculum (Gertsch, 1958: figs. 18–19; Brignoli, 1974: figs. 2–4); in *Pertica*, that median receptaculum is lacking, and only the semicircular bursa remains (Brignoli, 1974: fig. 1). *Segestrioides* shares the endite and bursal shape of those genera, but differs in having two small to large, laterally situated, sclerotized plates on the bursa (figs. 14, 15). The similarities in endite shape and female genitalic morphology among all three genera (and the striking similarity between *Segestrioides* and *Diguetia* in male palpal morphology) provide synapomorphies supporting Brignoli's (1983) relimitation of the Diguettidae to include just these taxa. No synapomorphies have been suggested to date that would support Simon's association of *Periegops* with these genera.

It is difficult to determine which two of the three diguetid genera are most closely related, not least because males of *Pertica* remain unknown. Males of *Segestrioides* have a wide, flattened, laminate embolus and lack the narrow terminal prong associated with that flattened structure in *Diguetia* (compare figs. 10–13 below with Gertsch, 1958: figs. 7–16, and Gerschman and Schiapelli, 1962: figs. 1–3), indicating that Gertsch's identification of the narrow prong (rather than the lamina) as the embolus is incorrect. The rather different, highly hirsute appearance of *Diguetia* is presumably autapomorphic, as the smoother cephalothorax of the other genera corresponds to that found in the Plectreuridae (which have been hypothesized to be the sister group of the Diguettidae; see Gertsch, 1958, and Lopez, 1984) and other haplogyne groups. The tarsal organ of *Segestrioides* (figs. 3, 4) is the typical flattened plate bearing concentric rings also found in both plectreurid genera, *Plectreurys* and *Kibramoa* (fig. 6). The tarsal organ of *Diguetia* is anomalously capulate (fig. 5), more closely resembling that of much more phylogenetically advanced groups than that of other haplogyne groups,

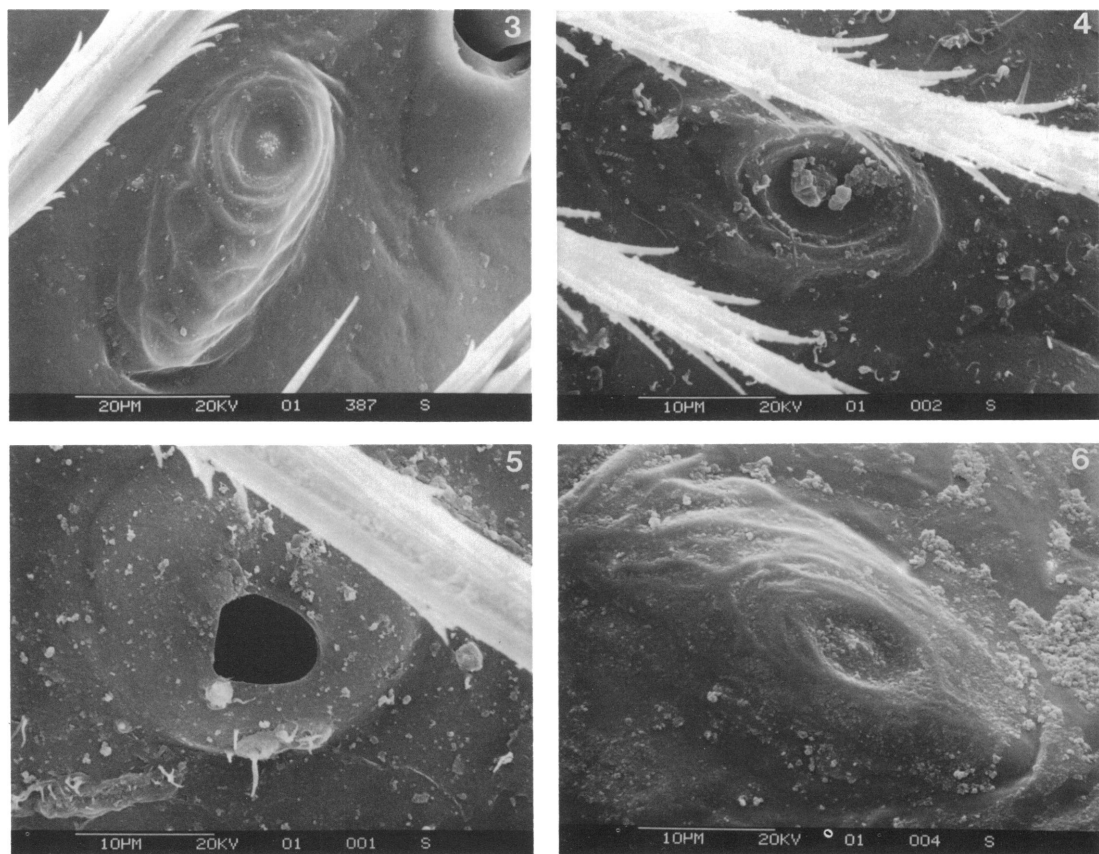
and must also be regarded as autapomorphic. The tarsal organ of *Pertica* will probably remain unknown until specimens other than the holotype can be collected.

*Diguetia* species spin extensive aerial webs in shrubs and cacti; females construct unique vertical retreats incorporating the egg sacs (Cazier and Mortenson, 1962; Eberhard, 1967; Galiano, 1969; Bentzien, 1973; Nuessly and Goeden, 1984). *Segestrioides* species dwell under rocks, with little associated webbing and normal egg sacs; males and females have been taken together, apparently sharing the same rock without hostility. The habits of *Pertica* are unknown.

Examination of the respiratory system of *Segestrioides* indicates that only the anterior booklungs are retained. The abdomen does show a slight ridge considerably in advance of the spinnerets, and a similar ridge in *Diguetia* was apparently taken by Gertsch (1958: 2) and Galiano (1969: 395) as evidence of posterior tracheae. Examination with compound microscopy revealed no trace of posterior spiracles or tracheae in either a juvenile or adult female of *S. bicolor*; the same result was reported by Lamy (1902) for *Diguetia*. Males of *Segestrioides* have an unusual genital area, with a widened gonopore elevated on a distinct protuberance; in *Diguetia*, the gonopore is even wider, but is not situated on a protuberance. Lopez (1984) reported that *Diguetia* lacks epiandrous spigots, and the same appears to be true for *Segestrioides*. The peculiarly modified setae reported in *Diguetia* by Lopez (1984) as part of the "supra-anal organ" also appear to be present in *Segestrioides*.

#### ACKNOWLEDGMENTS

I am deeply indebted to Dr. Coyle and his field crew for supplying the crucial specimens, to Ms. Jackie Palmer for providing photographs of the live spiders, and to Dr. M. U. Shadab and Mrs. C. M. Tibbetts for supplying illustrations. Important Chilean material was obtained from the collections of the American Museum of Natural History (AMNH) and from Dr. Evert Schlinger of the University of California, Berkeley (UCB). Helpful comments on the manuscript were received from Drs. Coyle, W. A. Shear of



Figs. 3–6. Tarsal organ from leg I of female, dorsal view. 3. *Segestrioides bicolor* Keyserling. 4. *S. tofo*, new species. 5. *Diguetia canities* (McCook). 6. *Kibramoa suprenans* (Chamberlin).

Hampden-Sydney College, and R. R. Forster and W. J. Gertsch (AMNH). This work was supported by National Science Foundation grants BSR-8312611 and BSR-8406225. All measurements are in millimeters.

## SYSTEMATICS

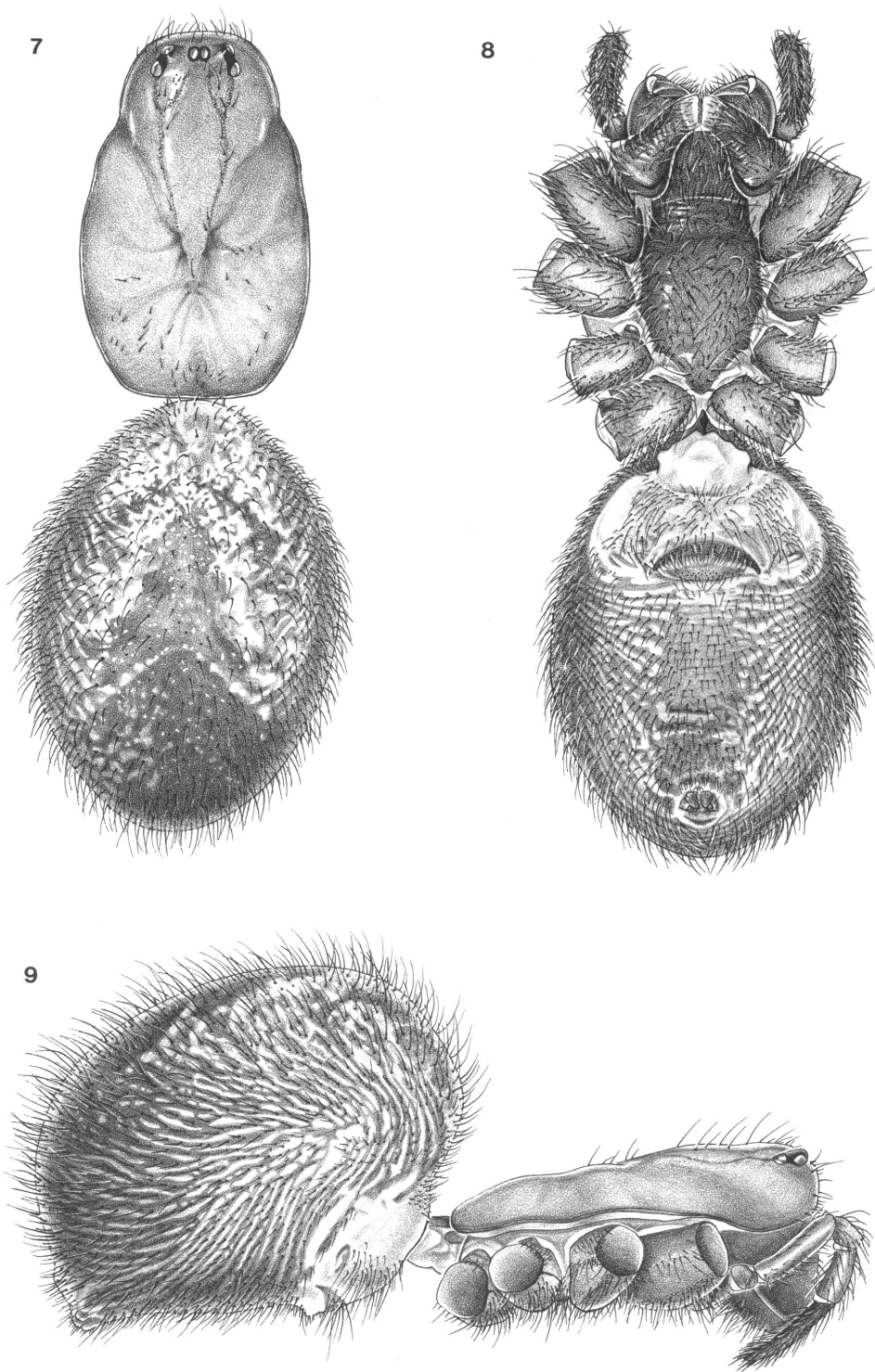
### *Segestrioides* Keyserling

*Segestrioides* Keyserling, 1883: 218 (type species by monotypy *Segestrioides bicolor* Keyserling).

**DIAGNOSIS:** *Segestrioides* can be distinguished from *Diguetia* by the absence of bands of thick setae on the abdomen and carapace (figs. 7–9), the absence of a narrow prong on the male palpal bulb (figs. 10–13), and the absence of a median receptaculum in the female genitalia (figs. 14, 15), and from *Pertica* by the presence of a pair of sclerotized lateral

plates on the female bursa copulatrix (figs. 14, 15).

**IDENTIFICATION:** The newly collected specimens here identified as *S. bicolor* conform well to Keyserling's description in size, coloration, and structure, including the eye arrangement, the high clypeus, the widened and deeply depressed thoracic groove, the endite shape, and the absence of leg spines and a female palpal claw. Keyserling (1883: 218) indicated that there are "Zwei Tracheenöffnungen vorn an jeder Seite des Bauches." Simon (1893: 278) interpreted that statement to mean that "Les stigmates épigastriques sont au nombre de deux, et la patte-mâchoire de la femelle est dépourvue de griffe, caractères qui indiquent suffisamment qu'il n'appartient pas à la famille des *Dysderides*." Although Keyserling's wording is ambiguous, and his



Figs. 7-9. *Segestrioides bicolor* Keyserling, female. 7. Dorsal view. 8. Ventral view. 9. Lateral view.

placement of the genus as a dysderoid could conceivably imply that he thought four anterior spiracles were present, Simon's interpretation is followed here. If the newly collected specimens are correctly identified, only two spiracles are present in the species.

**DESCRIPTION:** Ecribellate, haplogyne, araneomorph spiders (figs. 1, 2, 7-9). Carapace elongate, flattened, without feathery setae, with wide, deeply depressed thoracic groove (fig. 7). Six eyes (anterior medians lost) in three diads; anterior laterals and posterior medians forming nearing straight row in advance of posterior laterals. Chelicerae soldered together at base by conspicuous white membrane extending about one-fourth length of paturon, with distinct, translucent lamina medially and stridulatory file laterally (stridulatory pegs on palpal femur). Endites almost diamond-shaped, converging anteriorly. Labium longer than wide, with posterior half slightly narrowed, separated from sternum by shallow groove. Female pedipalp without claw, terminating in blunt extension. Leg formula 1423, all segments devoid of spines. Tarsi with three claws, superior claws with numerous teeth in single, slightly sinuous row; inferior claws with single tooth; tarsi I of males sometimes bent in lightly sclerotized area at about three-fourths of length, but not pseudosegmented. Tarsal organ flattened, bearing concentric ridges (figs. 3, 4). Abdomen elongate, without feathery setae, with six small spinnerets (anterior and posterior bisegmented) and undivided, setose colulus. Anterior respiratory system consisting of booklungs, posterior respiratory system apparently lost. Male palp with cymbium shallowly excavated distally, rounded tegulum, and wide, flattened, laminate embolus, without accessory sclerites (figs. 10-13). Epigynum externally with swollen, almost semicircular sclerotizations anterior and posterior of epigastric furrow, internally with semicircular bursa copulatrix bearing pair of small to large anterolateral sclerotized plates, without median receptaculum (figs. 14, 15). Male gonopore on distinct protuberance.

*Segestrioides bicolor* Keyserling

Figures 1-3, 7-9, 14

*Segestrioides bicolor* Keyserling, 1883: 219 (female holotype from San Mateo, Lima, Peru,

originally deposited in collection of University of Warsaw, lost). - Roewer, 1942: 330. - Bonnet, 1958: 4010.

**DIAGNOSIS:** This Peruvian species is easily separated from its Chilean congeners by its larger size and the much wider sclerotized lateral plates on the female bursa copulatrix (fig. 14).

**MALE:** Unknown.

**FEMALE:** Total length 11.10. Carapace 4.95 long, 3.30 wide, bright reddish-orange with thoracic groove darkened, pair of dark stripes extending from thoracic groove to posterior lateral eyes, each stripe with side branch diverging to posterior median eyes (fig. 7); clypeus darkened medially; all darkened areas with erect, black setae; lateral margins rebordered. Chelicerae, mouthparts, and sternum dark reddish-orange. Leg I and distal segments of leg II dark reddish-orange, remaining leg segments lighter; femur I sinuous but without distinct tubercles. Abdomen gray, dorsally with two lighter chevrons (fig. 8), laterally with numerous curving, lighter stripes (fig. 9). Bursa copulatrix with sclerotized lateral plates occupying almost all of bursal width (fig. 14).

**MATERIAL EXAMINED:** PERU: *Lima*: W edge, San Mateo, Mar. 27, 1988, elevation 3100 m, under rocks in eucalypt forest (F. Coyle, R. Bennett, J. Palmer, D. Smith, AMNH), 5♀.

**DISTRIBUTION:** Known only from the type locality in Peru.

*Segestrioides copiapo*, new species

Figures 10, 11

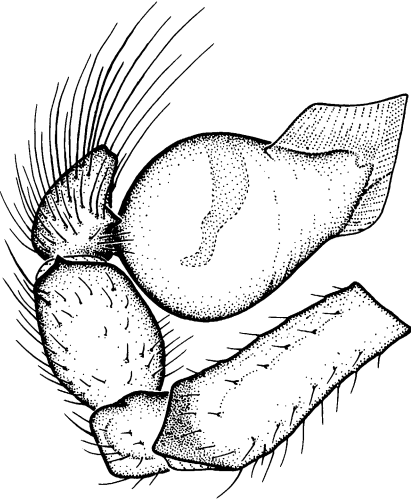
**TYPE:** Male holotype from 30 km S of Copiapó, Copiapó, Region de Atacama (III), Chile (Aug. 18, 1966; E. I. Schlinger, M. E. Irwin), from UCB, deposited in Universidad de Chile, Santiago, on long-term loan to California Academy of Sciences.

**ETYMOLOGY:** The specific name is a noun in apposition taken from the type locality.

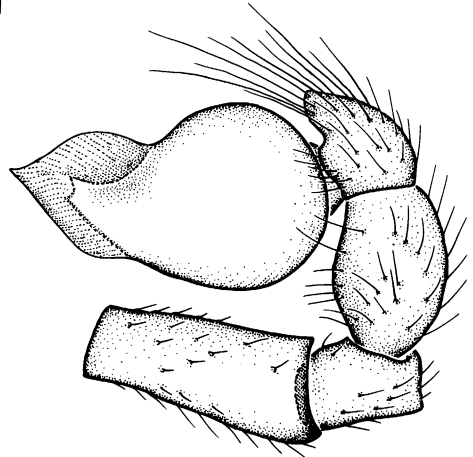
**DIAGNOSIS:** Males can be distinguished from those of *S. tofo* by the bent tarsi I, the angular palpal patella, and the more rotund palpal bulb (figs. 10, 11).

**MALE:** Total length 4.99. Carapace 2.39 long, 1.65 wide. Coloration as in female of *S. bicolor* except darker areas of cephalotho-

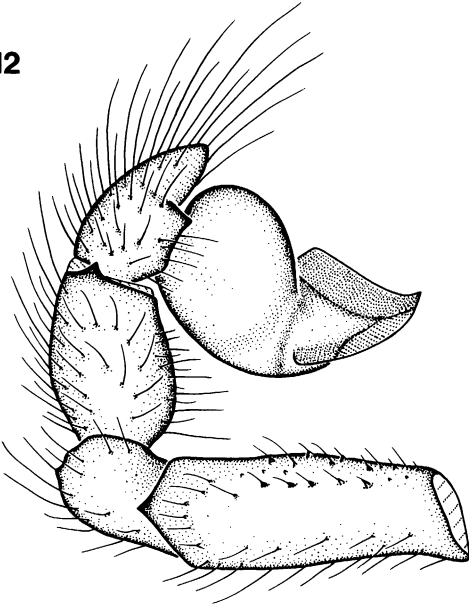
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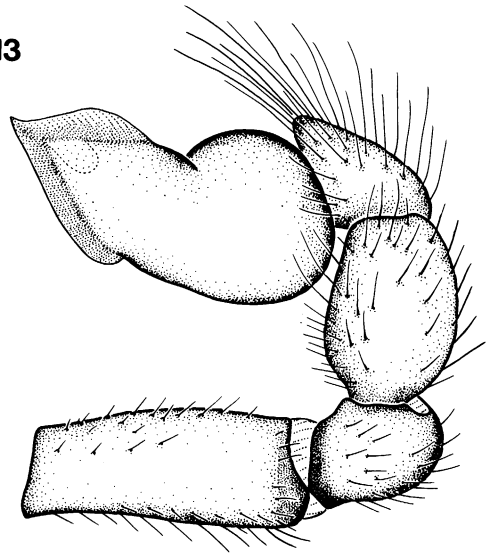
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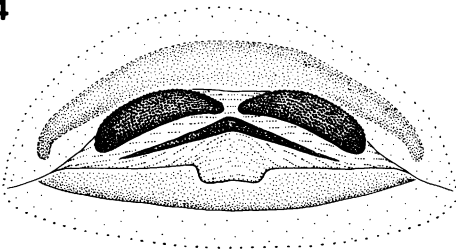
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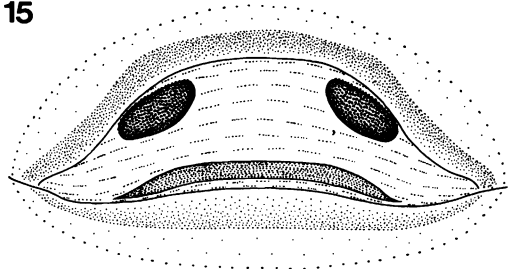
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14



15



Figs. 10–15. Genitalia of *Segestrioides*. 10, 11. *S. copiapo*, new species, left male palp, prolateral and retrolateral views. 12, 13. *S. tofo*, new species, left male palp, prolateral and retrolateral views. 14. *S. bicolor* Keyserling, epigynum, dorsal view. 15. *S. tofo*, new species, epigynum, dorsal view.

rax and appendages orange, lighter areas yellowish-orange; femora, patellae, tibiae, and metatarsi slightly darkened at distal ends. Femur I only slightly sinuous, slightly tuberculate; tarsus I distinctly bent at about three-fourths of length. Palpal patella angular, bulb rotund, not narrowed behind lamina (figs. 10, 11).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from northern Chile.

*Segestrioides tofo*, new species

Figures 4, 12, 13, 15

TYPES: Male holotype and female allotype taken together under a rock at an elevation of 1600 ft in the coastal mountain range 4 km E of El Tofo, Elqui, region de Coquimbo (IV), Chile (Nov. 2, 1981; N. I. Platnick, R. T. Schuh), deposited in AMNH.

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can be distinguished from those of *S. copiado* by the unbent tarsi I, the rounded palpal patella, and the narrower palpal bulb (figs. 12, 13); females can be distinguished from those of *S. bicolor* by the much smaller, more widely separated sclerotized plates on the bursa copulatrix (fig. 15).

MALE: Total length 5.55. Carapace 2.59 long, 1.73 wide. Coloration as in female of *S. bicolor* except dark markings on carapace evident only on clypeus; dorsum of abdomen with paramedian longitudinal white patches on anterior half. All femora distinctly tuberculate; tarsi I entire, not bent. Palpal patella rounded; bulb distinctly narrowed behind lamina (figs. 12, 13).

FEMALE: Total length 6.45. Carapace 2.44 long, 1.59 wide. Coloration and leg modifications as in male. Bursa copulatrix with sclerotized plates small, widely separated (fig. 15).

OTHER MATERIAL EXAMINED: CHILE: **Region de Coquimbo (IV): Elqui:** E Choros Bajos, Nov. 13, 1981 (L. E. Peña G., AMNH), 1♀; 3 km E El Tofo, Jan. 7, 1985, elev. 45 m, under rocks, scrubby mountainside (N. I. Platnick, O. F. Francke, AMNH), 2♀; 20 km N La Serena, Jan. 6, 1985, elev. 90 m, under

rocks, coastal scrub (N. I. Platnick, O. F. Francke, AMNH), 1♀; 30 km N La Serena, Nov. 2, 1981, elev. 10 ft, on beach (N. I. Platnick, R. T. Schuh, AMNH), 1♂. **Region de Valparaíso (V): Quillota:** Cuesta Pucalán, Aug. 1, 1966 (E. I. Schlinger, M. E. Irwin, UCB), 2♀.

DISTRIBUTION: Known only from north-central Chile (Coquimbo to Valparaíso).

NOTE: The type specimens were collected living together under a rock; the female had an egg sac containing about seven eggs.

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