AMERICAN MUSEUM
Novitates

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, NY 10024
Number 3262, 10 pp., 17 figures May 4, 1999

The Spider Genus *Crossopriza* (Araneae, Pholcidae) in the New World

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ABSTRACT

Crossopriza Simon, 1893 (Pholcidae) is a predominantly Old World spider genus with only a few records from the New World. The present paper reevaluates the New World records, and shows that *C. lyoni* (Blackwall, 1867), a synanthropic spider, has been recorded under several different names in various parts of the world and is the only unequivocal species in the New World. New junior synonyms of *C. lyoni* are *C. brasiliensis* Mello-Leitão, 1935, from Brazil; *C. mucronata* Mello-Leitão, 1942, from Argentina; and *C. francoisi* Millot, 1946, and *C. stridulans* Millot, 1946, from Madagascar. We present a detailed redescription and several new records for *C. lyoni*. The Argentine *C. saltensis* Mello-Leitão, 1941, is newly synonymized with *Priscula binghamae* (Chamberlin, 1916).

INTRODUCTION

It has been argued recently that pholcid spiders are quite strictly separated into two groups, one better represented in the Old World (and possibly monophyletic), the other one more diverse in the New World (Brignoli, 1981; Huber, 1998b). It is thus of special interest to examine those genera that supposedly have representatives both in the New and Old Worlds. Huber (1998b) argued that most representatives of Old World pholcid genera in the New World may be misplaced or introduced. A major source of confusion is the fact that previous authors often did not publish the habitat, especially whether the species was found within buildings (and might therefore be an introduced spe-

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 ISSN 0003-0082 / Price $1.60

cies) or in a natural habitat. *Crossopriza* Simon, 1893, is one of the Old World genera that has been reported from both sides of the Atlantic. The present paper reevaluates the American records of *Crossopriza.*

ABBREVIATIONS

AMNH American Museum of Natural History
BMNH The Natural History Museum, London
MCN Museu de Ciencias Naturais, Porto Alegre, Brazil
MCZ Museum of Comparative Zoology, Cambridge
MELN Museo Entomológico, S. E. A., León, Nicaragua
MLP Museo de La Plata, Argentina
MNRJ Museu Nacional de Rio de Janeiro, Brazil

TAXONOMY

Crossopriza lyoni (Blackwall, 1867)

FIGURES 1–12

Pholcus lyoni Blackwall, 1867: 392–394.
Crossopriza lyoni: Pocock, 1900: 240.
Crossopriza brasiliensis Mello-Leitão, 1935: 94, 96, fig. 13a–c. NEW SYNONYMY.
Crossopriza mucronata Mello-Leitão, 1942: 389–390, figs. 1, 2. NEW SYNONYMY.
Crossopriza francoisi Millot, 1946: 154–155, figs. 29, 30B. NEW SYNONYMY.
Crossopriza stridulans Millot, 1946: 156–157, fig. 31. NEW SYNONYMY.

TYPES: *C. lyoni*: numerous specimens from India ("Meerut, Agra, and Delhi"), apparently lost (see Notes below). *C. brasiliensis*: 1 male, 1 female, 1 juv., syntypes from Brazil, Paraguassú (Bahía), no date (O. Leonardos), in MNRJ (42313), examined. *C. mucronata*: female syntype and 1 juv. from Argentina, Beltrán (Santiago del Estero), no date (M. Birabén), in MLP (15.800) examined. (The MLP has another vial containing a female, with the label "*Crossopriza mucronata,* Lectotype design. Brignoli 1973." This female was examined by one of us (A. P.-G.), and is conspecific with *C. lyoni.* Brignoli's lectotype designation was never published, so the specimens are here treated as syntypes). *C. francoisi*: male holotype from Madagascar, Maevatanana, in a bathroom, 1945 (J. Millot), not examined (see Notes below). *C. stridulans*: female holotype from Madagascar, Majunga, 1945 (J. Millot), not examined (see Notes below).

NOTES: First, we have not been able to locate the type material of *C. lyoni* (it is apparently neither in the Hope Collection in Oxford, nor in The Natural History Museum in London). However, Blackwall's (1867) original description is relatively detailed, and the species has superficially been redescribed and illustrated several times (e.g. Dyal, 1935; Chrysanthus, 1967; Yaginuma, 1982; 1986; Kim, 1988; Chikuni, 1989; Chen and Zhang, 1991; Edwards, 1993), and may thus be regarded as relatively well known. Furthermore, we have studied material from all over the world (see below), including India, where the type material originated. Therefore, we consider it extremely probable that we are indeed dealing with *C. lyoni.*

Second, we have not studied the type material of *C. francoisi* and *C. stridulans* (which is probably at the MNHN, Paris), because Millot's (1946) original descriptions and excellent illustrations leave no reasonable doubt about the identity of the two "species."

OTHER MATERIAL EXAMINED: **Argentina**: *La Rioja*: La Rioja (E. & P. Boman, Apr. 1914), 1 female, 1 juv. (AMNH); *Tucumán*: San Miguel de Tucumán (M. L. Aczel, May 1–15, 1950), 1 male, 4 females (AMNH). **Australia**: *Northern Territory*: Darwin (B. Malkin, Feb. 9–Mar. 31, 1945), numerous males and females (AMNH); 120 mi SE Darwin (J. Anderson, Jan.–Feb. 1972), 1 male (AMNH). **Brazil**: *São Paulo*: Jaboticabal, from plantations (?; the label says "orange, coffee, sugarcane") (W. & L. Miller, 1979), several females and juveniles (MCZ); *Minas Gerais*: Governador Valadares: Iburuna, resort club building (L. M. Sorkin et al., Sept. 9, 1982), 1 male, 1 female (AMNH); Governador Valadares, northern part of city (L. M. Sorkin & C. E. de Assis Bandera, Sept. 1, 1992), 1 female (AMNH); Curvelo (F. Pough, Oct. 23, 1943), 2 females (AMNH). *Mato Grosso*: Porto Esperanza (Upper Paraguay River), no further collection data, 1 female (AMNH). *Pará*: Itaituba (about 470 km E Manaus, at Tápajos River) (A. A. Lise, Dec. 7, 1991), 1 male, 1 female (MCN). **In-**

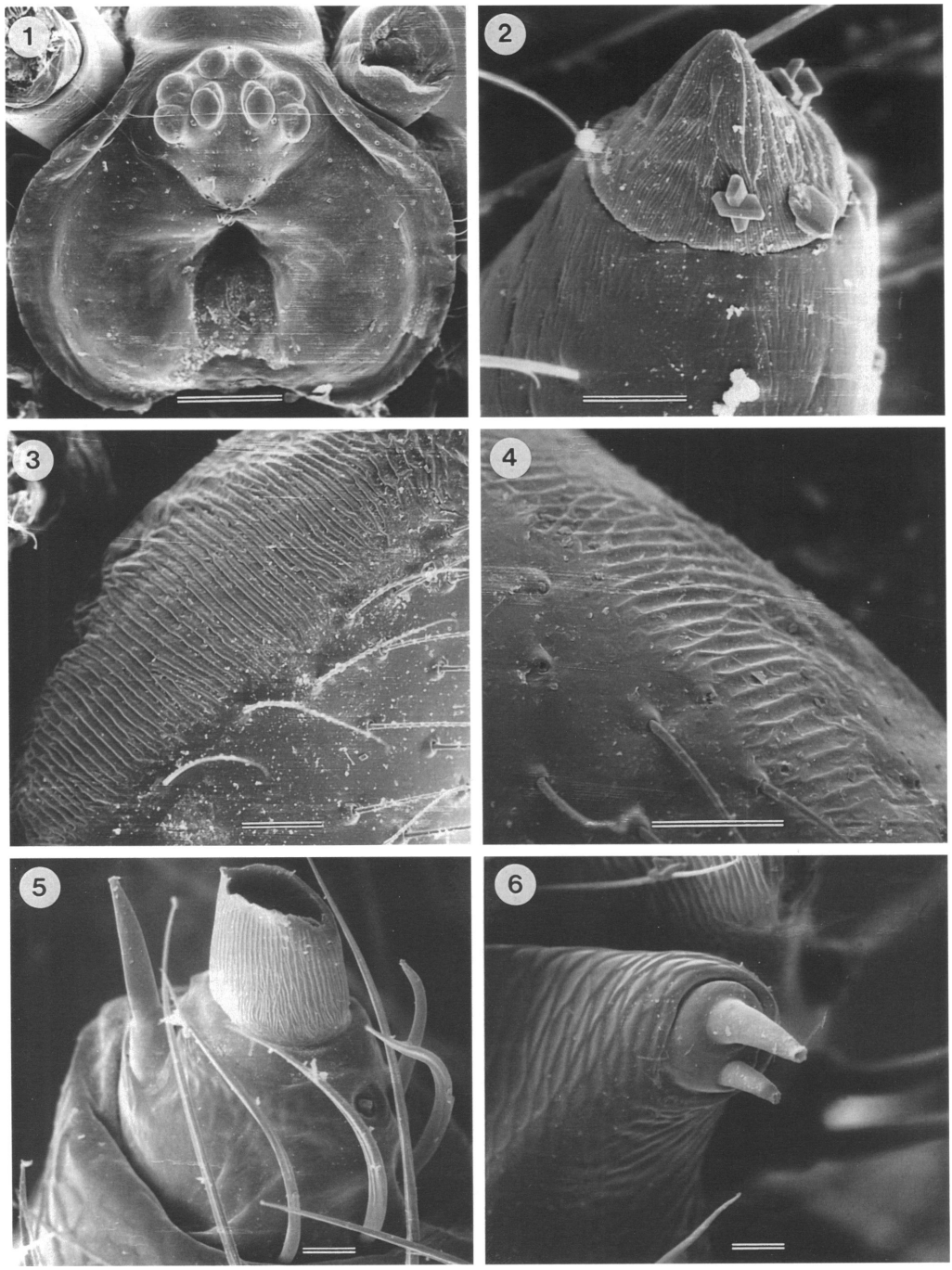
dia: *West Bengal*: Kanchrapara (near Calcutta) (M. Cazier, Aug. 1–12, 1944), many males and females (AMNH). **Mali**: *Gao*: Gao (B. Malkin, Nov. 23–25, 1948), 1 male, 3 females, 2 juv. (AMNH). **Nicaragua**: *León*: Ciudad de León, in house (L. F. Armas, Aug. 10, 1995), 2 males, 1 female (MELN). *Managua*: Laguna Xiloa (L. F. Armas, J. M. Maes, J. T. Goodwin, July 13, 1995), 1 juv. (MELN). **Nigeria**: *Lagos*: Lagos University grounds (Usua, 1973), 1 female (BMNH). **Paraguay**: *Boquerón*: 19 km N Filadelfia: Estancia Iparoma (K. L. Anderson, Oct. 5, 1978), 1 penult. female (AMNH). **Philippines**: *Leyte*: Baybay (C. K. Starr, Sept. 3–6, 1984), 2 males, 2 females (AMNH); *Luzon*: Batangas ("ceiling of building") (C. K. Starr, Aug. 4, 1986), 1 male, 1 female (AMNH); Rizal Prov., Alabang (B. Malkin, Sept. 1945), 1 female (AMNH); Lingayen (R. B. Burrows, June–July 1945), 1 female (AMNH). **Sri Lanka**: Tissamaharama, on shaded walls outside house (C. L. Deeleman & P. R. Deeleman, Aug. 17, 1981), 1 male, 2 females (coll. Deeleman). **USA**: *Texas*: Brazos Co.: College Station (R. G. Breene, no date), 1 male, 3 females (AMNH).

DIAGNOSIS: Large pholcid (body length about 4–6 mm), opisthosoma high, angular posteriorly. Distinguished from congeners by the two pairs of apophyses on the male chelicerae, one lateral, one frontal and directed inwards (cf. also figures in Millot, 1946). Legs with many short, dark, longitudinal spots. Female with uncommon "stridulatory apparatus": a pair of protuberances on posterior side of prosoma, and a corresponding pair of sclerotized plates on opisthosoma (dorsally). Other representatives of the genus have either a cylindrical opisthosoma (*C. cylindrogaster*—male unknown), or only one pair of apophyses on the male chelicerae (*C. pristina, C. semicaudata, C. soudanensis*).

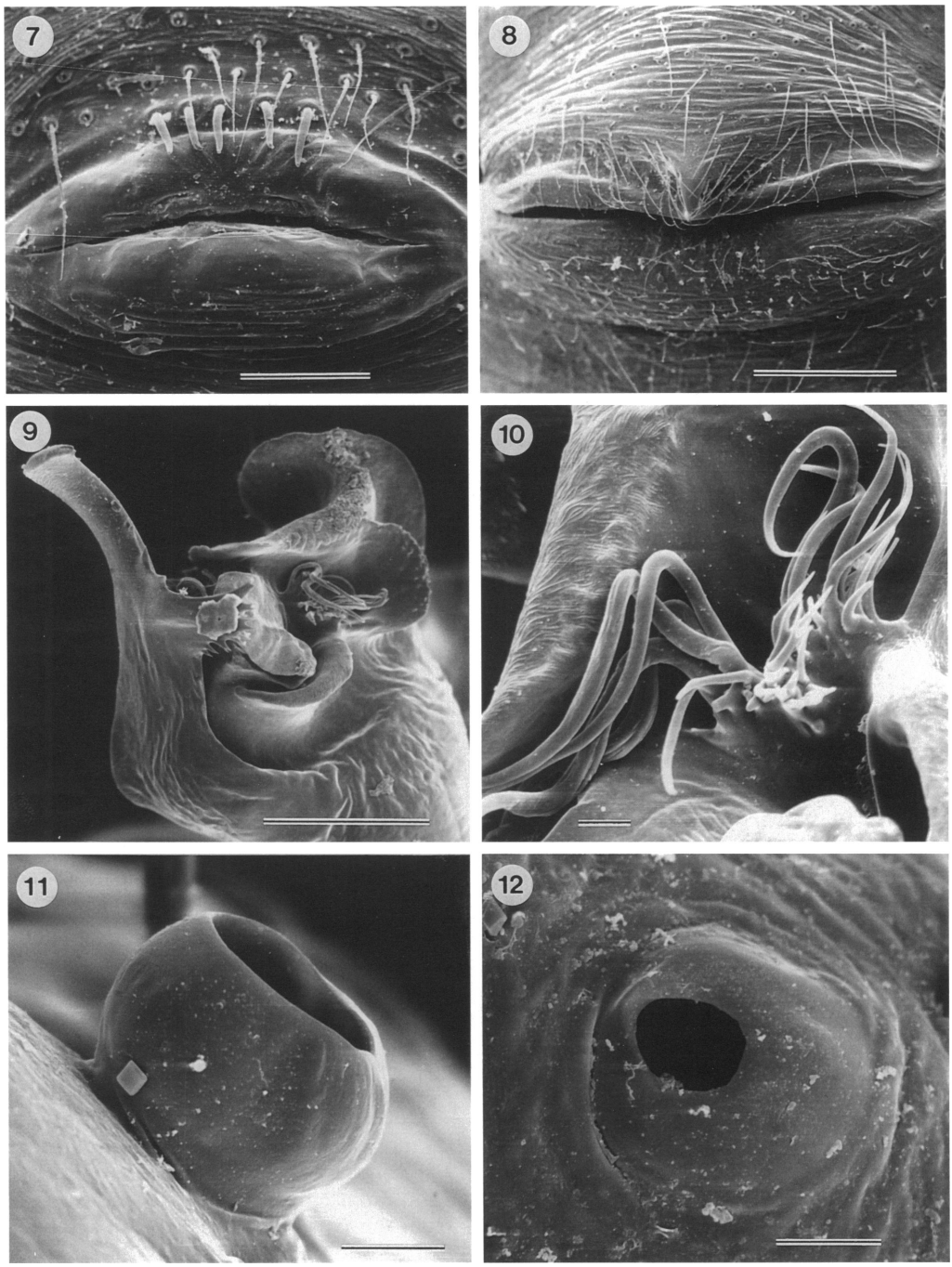
REDESCRIPTION: The descriptions by Millot (1946) (under *C. francoisi*: male, and *C. stridulans*: female) are excellent and include the best existing drawings of the species. The present redescription focuses on characters that have not been described or illustrated before, on the diagnostic characters, and on more complete measurements and documentation of size variation.

Carapace shape and eye position as in figure 1. Armature of male chelicerae in specimens studied identical with that given in Millot's figure 29a, but Millot missed three details easily overlooked in light-microscopy: first, cone-shaped hairs (mechanoreceptive sensilla?) on tips of inner apophyses (one on each apophysis: fig. 2); second, stridulatory files on lateral faces (fig. 3) (also present in females, but less developed: fig. 4); third, presence of some slightly modified hairs (thickened at basis) frontally near median line of each chelicera. Spinnerets resembling those of *Pholcus phalangioides* (see Platnick et al., 1991) except for ALS: only equipped with enlarged piriform gland spigot (terminology adopted from Platnick et al., 1991), and pointed major ampullate gland spigot (fig. 5), lacking smaller piriform gland spigots found in *P. phalangioides*. PMS equipped with one pair of spigots each (fig. 6), as in *P. phalangioides*. In front of male gonopore four to six spigots in males studied (fig. 7 shows male with five spigots). Epigynum with pair of large transverse grooves (fig. 8), easily overlooked in light-microscopy. Judging by size and position, it seems probable that grooves accommodate male frontal apophyses during copulation. Bulb consisting of sclerotized band connecting bulbal basis to terminal apophysis, and soft, almost translucent globular part. Tip of procursus more complicated than suggested by Millot's figure 29B (his lateral view, though accurate, does not show the ridges and hair-shaped protrusions shown in figs. 9, 10). Spines (macrosetae) on male femur 1 difficult to count as they gradually become normal hairs toward basis of femur, but number usually varying between 20 and 25. Tarsal organs (only those on pedipalps were studied with SEM) conspicuously elevated in male (fig. 11), much less so in female (fig. 12).

Measurements of a male from Nicaragua (mm): total length: 5.9; prosoma length: 2.0; prosoma width: 2.3; opisthosoma length: 3.6; legs (tibind = tibia length/tibia diameter):



Figs. 1–6. *Crossopriza lyoni,* specimens from India. **1.** Male prosoma, dorsal view. **2.** Cone-shaped hair at the tip of the inner apophysis of the male chelicera. **3.** Stridulatory file on the lateral face of the male chelicera. **4.** Stridulatory file on the lateral face of the female chelicera. **5.** Anterior lateral spinneret (female). **6.** Posterior median spinneret (male). Scale lines: 0.5 mm (1); 0.01 mm (2, 5, 6); 0.05 mm (3, 4).



Figs. 7–12. *Crossopriza lyoni,* specimens from India. **7.** Male gonopore with epiandrous spigots. **8.** Epigynum, ventral view. **9.** Tip of procursus, laterodistal view. **10.** Hair-shaped protrusions on the procursus (cf. fig. 9 for their location). **11.** Male pedipalpal tarsal organ. **12.** Female pedipalpal tarsal organ. Scale lines: 0.1 mm (7, 9); 0.3 mm (8) 0.01 mm (10–12).

	1	2	3	4
fem	17.8	13.0	10.4	12.5
pat	1.0	0.9	0.9	0.9
tib	16.2	11.4	8.4	9.6
met	20.3	16.2	12.5	14.5
tar	3.0	2.0	1.5	1.6
total	58.3	43.5	33.7	39.1
tibind	64	51	38	40

Femur 1 in other material (mm); 4 males from Darwin, Australia: 13.6–16.8 ($\bar{x}$ = 14.9); 20 males from Kanchrapara, India: 11.2–15.9 ($\bar{x}$ = 13.7); male syntype of *C. brasiliensis*: 13.5; male holotype of *C. francoisi*: 20 mm (Millot, 1946).

Measurements of female from Nicaragua (mm): total length: 4.1; prosoma length: 1.4; prosoma width: 1.7; opisthosoma length: 2.7; legs (tibind see above):

	1	2	3	4
fem	11.3	8.4	6.4	7.9
pat	0.8	0.7	0.7	0.7
tib	10.5	7.0	5.1	6.2
met	14.3	10.1	7.4	9.1
tar	2.5	1.6	1.1	1.2
total	39.4	27.8	20.7	25.1
tibind	55	40	29	35

Femur 1 in other material (mm): 13 females from Darwin, Australia: 11.1–16.4 ($\bar{x}$ = 14.3); 20 females from Kanchrapara, India: 10.4–13.9 ($\bar{x}$ = 12.1); female holotype of *C. stridulans*: 12.5 (Millot, 1946); female lectotype of *C. mucronata*: 15.7; female syntype of *C. brasiliensis* 12.0.

JUSTIFICATION OF SYNONYMIES: The female syntypes of *C. mucronata* and the female syntype of *C. brasiliensis* exactly match the female from Nicaragua and Millot's (1946) description of *C. stridulans*. Millot (1946) had only one male available of *C. francoisi* and only one female of *C. stridulans*. Both were found within or at houses (*C. francoisi* was collected in a bathroom, *C. stridulans* is classified as "semi-domestique" in Millot's introduction). The specimens collected in Nicaragua were also found within a building, and the males are clearly conspecific with the male syntype of *C. brasiliensis* and, judging by Millot's excellent figures, are synonyms of *C. francoisi*.

STRIDULATION: Two types of stridulatory organs occur in *C. lyoni*, which can be classified, according to Legendre (1963), as type d (palps against chelicerae) and type a (opisthosoma against prosoma). Both present obvious cases of convergent evolution in pholcids. Type a stridulation of the same configuration (paired) occurs in several species of the distantly related genus *Anopsicus* (see Gertsch, 1982), and in "*Coryssocnemis*" *viridescens* Kraus, 1955 (see Huber, 1998a). Type d stridulation is even more common, and is also found in several distantly related genera (Huber, 1995).

Priscula binghamae (Chamberlin, 1916), new combination

FIGURES 13–17

Hypsorinus binghamae Chamberlin, 1916: 224–226, pl. 13, figs. 1–9; pl. 14: figs. 1–7.

Crossopriza saltensis Mello-Leitão, 1941: 109, pl. 7, fig. 7. NEW SYNONYMY.

Physocyclus binghamae: Brignoli, 1981: 97, figs. 11-13, 19–20.

TYPES: *Hypsorinus binghamae*: male holotype, female paratype and 2 juveniles from Peru, Huadquina, 5000 ft elev. (collector not given, July 1911), MCZ (male apparently lost, female and juveniles examined). *Crossopriza saltensis*: female holotype from Argentina, Salta, Santa Barbara, (M. Birabén, no date), MLP (14.625), examined.

NOTE: A detailed redescription of the species, together with descriptions of several new species of *Priscula*, is in preparation (Huber, MS). Here we concentrate on the type specimen of *C. saltensis*, and will discuss the synonymy with *Hypsorinus binghamae* and its transfer to *Priscula* only to the extent necessary to justify these taxonomic changes.

DIAGNOSIS: Large pholcid with eight eyes on moderately elevated ocular area (figs. 13–15), high globular abdomen (fig. 13), and simple flat epigynum (fig. 16). Distinguished from the two other described species (*P. gularis* Simon, 1893, and *P. venezuelana* Simon, 1893) by the dorsal membraneous projection on the male procursus (cf. figures in Brignoli, 1981, and Huber, 1997), and the wide trapezoidal epigynum (fig. 16) (in *P. gularis* it is oval, in *P. venezuelana* as long as wide, cf. figures in Huber, 1997).

OTHER MATERIAL EXAMINED: **Bolivia**: *La*

Paz: La Paz, house, 12,000 ft elev. (R. Walsh, Apr. 1958–Apr. 1959: 5 vials), 4 males, 5 females, juveniles, AMNH.

REDESCRIPTION (*C. saltensis* type specimen): Basic color ochre brown, with yellowish and brown marks (figs. 13-15). Sternum yellow with dark margin, labium dark. Opisthosoma ochre with black spots dorsally (fig. 13). Legs yellowish with dark rings on femora (one ring distally) and tibiae (one ring proximally, one ring distally). Eight eyes on slightly elevated ocular area (figs. 13–15), prosoma of type specimen deformed (fig. 14), opisthosoma very high (fig. 13). Epigynum simple flat plate, diverging posteriorly (fig. 16). Internal female genitalia possibly with "Old-World-valve" (as defined by Huber, 1998b; this could only be determined with sagittal sections) (fig. 17).

Measurements (mm): total length: 4.7; prosoma length: 1.8; opisthosoma length: 2.9; legs (tibind, see above):

	1	2	3	4
fem	8.4	—	4.9	7.2
pat	0.9	—	0.8	0.9
tib	9.0	—	4.3	6.4
met	13.0	—	6.7	9.3
tar	3.4	—	1.4	1.9
total	34.7	—	18.1	25.7
tibind	38	—	19	25

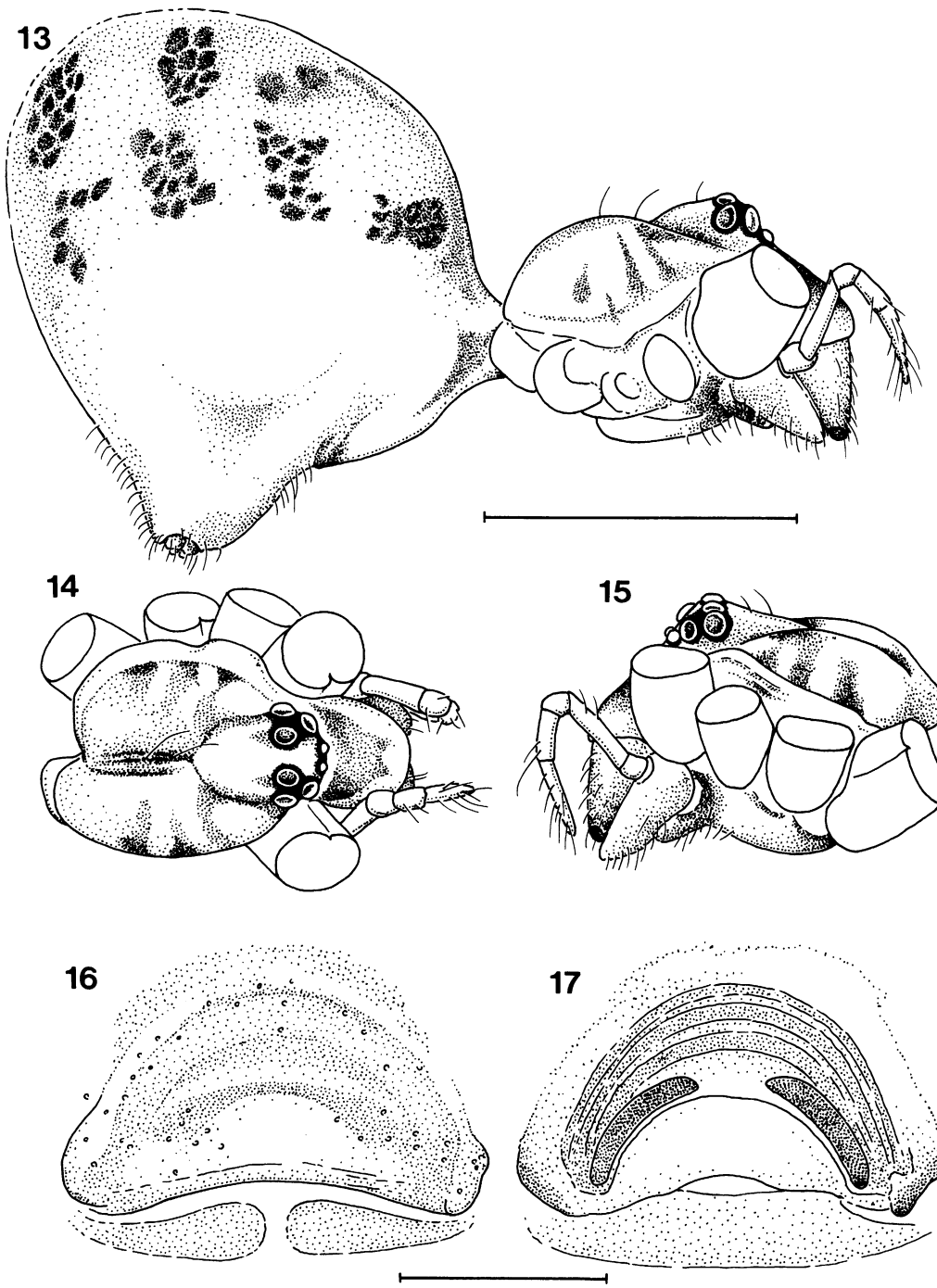
DISCUSSION: Brignoli (1981) synonymized the genus *Priscula* Simon, 1893, with *Physocyclus* Simon, 1893. This synonymy has been questioned by Huber (1997), but results from a preliminary cladistic analysis are ambiguous with respect to their relationship (Huber, unpubl. data). The present species is obviously closely related to the type species of *Priscula* (*P. gularis* Simon, 1893), as well as to *P. venezuelana* Simon, 1893, and several other as yet undescribed species (Huber, MS). All those species differ from *Physocyclus* species by the following: only one pair of simple apophyses on the male chelicerae, absence of stridulatory files on the chelicerae, absence of the "basal hood" and "basal projection" on the procursus (see Huber and Eberhard, 1997, for illustrations of these characters), and the simple flat epigyna.

Because of the simplicity of the epigynum, females of the genus are not easily distinguished. However, we propose *C. saltensis* as a synonym of *Priscula binghamae* for the following reasons: first, the epigyna are indistinguishable (both in ventral and dorsal view); second, of the 15 described and undescribed species of *Priscula* known to us, *P. binghamae* is the only species so far recorded from south of Central Peru, and it is the only one that has been found to be widely distributed (Peru, Bolivia, Argentina).

GENERAL DISCUSSION AND SUMMARY

The genus *Crossopriza* is part of a group of Old World genera for which the name *Holocnemus* group was proposed by Timm (1976). The available delimitations of genera within the group are vague and probably artificial (e.g., Wiehle, 1933), and are beyond the scope of the present paper. Two genera of the *Holocnemus* group have a single cosmopolitan synanthropic representative each in America: *Holocnemus* (*H. pluchei* (Scopoli)—Porter and Jakob, 1990; Edwards, 1993) and *Smeringopus* (*S. pallidus* (Blackwall)—Platnick, 1989; Edwards, 1993). Only the genus *Crossopriza* has been thought to have several species both in the New World and in the Old World (type species: *C. pristina* (Simon, 1890) from Aden, Yemen). Only species recorded from America will be discussed below.

Six species have been recorded in America. Of these, *C. sexsignata* Franganillo, 1926, has recently been synonymized with *Artema atlanta* Walckenaer (Pérez-González, 1996). *Crossopriza pristina* was cited by Franganillo (1926, 1936a, 1936b) for Cuba, but its presence there is dubious (Pérez-González, 1996). *Crossopriza lyoni* (Blackwall, 1867) is obviously a synanthropic cosmopolitan species, with several records from North, South, and Central America (see records above). *Crossopriza mucronata* Mello-Leitão, 1942, from Argentina and *C. brasiliensis* Mello-Leitão, 1935, from Brazil are here synonymized with *C. lyoni*. "*Crossopriza*" *saltensis* Mello-Leitão, 1941, is here synonymized with *Priscula binghamae* (Chamberlin, 1916). Concluding, the introduced *C. lyoni* is the only known represen-



Figs. 13–17. *Priscula binghamae*: female holotype of *Crossopriza saltensis*. Note that the prosoma is squashed and therefore appears higher and narrower than would be normal. **13.** Lateral view. **14.** Prosoma, dorsal view. **15.** Prosoma, lateral view. **16.** Epigynum, ventral view. **17.** Epigynum, dorsal view. Scale lines: 2 mm (13–15); 0.5 mm (16, 17).

tative of the genus *Crossopriza* in the New World.

ACKNOWLEDGMENTS

We thank L. F. Armas and J. M. Maes for access to the material they collected in Nicaragua, and C. A. Sutton, P. Hillyard, L. Leibensperger and A. B. Kury for sending types and other material. The help of R. Salmasso in locating and sending "lost" type material is highly appreciated. A. Klaus kindly assisted at the SEM. G. Hormiga, C. E. Griswold, and N. I. Platnick provided valuable comments on previous versions of the manuscript. This study was supported by postdoctoral grant J01254 from the FWF, Austria, and a Theodore Roosevelt Postdoctoral Fellowship at the American Museum of Natural History (to BAH).

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