

THE AMERICAN SPECIES OF THE ORB-WEAVER GENUS
CAREPALXIS AND THE NEW GENUS *RUBREPEIRA*
(ARANEAE: ARANEIDAE)

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INTRODUCTION

While the majority of species of Neotropical orb weavers are new, there are some exceptions. Spiders of unusual appearance, even though extremely rare, have been named. Apparently 19th century arachnologists searched through collections for unusual specimens to name. Regrettably, unlike most common, undistinguished spiders, the holotypes for some of the names of unusual spiders are immature specimens. Eight names compete for the apparently three, valid species of American *Carepalxis*. Three of the names are attached to immature holotypes. Immature spider holotypes, lacking the species characteristic genitalia, are difficult to place and if their names have priority may create nomenclatural problems.

Males of American species of both genera *Carepalxis* and *Rubrepeira* are unknown.

METHODS AND MATERIALS

The methods used in these revisions of Neotropical araneid orb weavers are described in some detail in a forthcoming revision of the genera *Wixia*, *Pozonia*, and *Ocrepeira* (Levi, in press).

Eye sizes are described using the diameter of the anterior median eyes as standard. For the anterior eye row, the distance between eyes is measured in the number of anterior median eye diameters; for the posterior row, the number of posterior median eye diameters.

The following collections contain specimens of *Carepalxis* and *Rubrepeira*. I thank their curators for making the spiders available.

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- AMNH American Museum of Natural History, New York, United States; N. Platnick, L. Sorkin
- BMNH British Museum (Natural History), London, England; P. Hillyard, F. Wanless
- CAS California Academy of Sciences, San Francisco, United States; W. J. Pulawski, D. Ubick
- MACN Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina; E. A. Maury
- MCN Museu de Ciências Naturais, Porto Alegre, Rio Grande do Sul, Brazil; E. H. Buckup
- MCZ Museum of Comparative Zoology, Cambridge, Massachusetts, United States
- MECN Museo Ecuatoriano de Ciencias Naturales, Quito, Ecuador; L. Avilés
- MNHN Muséum National d'Histoire Naturelle, Paris, France; J. Heurtault, C. Rollard
- MNRJ Museu Nacional, Rio de Janeiro, Brazil; A. Timotheo da Costa
- MZSP Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil; P. Vanzolini, L. Neme, J. L. M. Leme
- PAN Polska Akademia Nauk, Warszawa, Poland; W. Starega, J. Proszynski, A. Slojewska, E. Kierych
- ZMH Zoologisches Institut und Museum, Hamburg, Germany; G. Rack

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Carepalxis L. Koch

Carepalxis L. Koch, 1872: 123. Type species by monotypy *C. montifera* L. Koch, 1872: 123. The gender of the name is feminine (Bonnet, 1956: 954).

Notes. The female holotype of *Carepalxis montifera* is in the ZMH and comes from Port Mackay [Mackay, Queensland], Australia. It has been examined for this revision. Its abdomen is

shrivelled and the scape torn off. A better specimen of this species has recently been illustrated by Davies (1988: 302).

Diagnosis. The carapace differs from that of most other araneids and especially from the related *Scoloderus*, *Wixia* and *Ocrepeira* by having two humps or tubercles (Figs. 4, 5, 8–10, 15–17). Such humps are also present in *Gasteracantha*. The related *Scoloderus* differs by having one carapace hump larger and median (Levi 1976, figs. 125, 126) and by being much smaller in size with the abdomen having paired humps or being shield-shaped (Levi, 1976, figs. 126, 128). *Gasteracantha* differs by having a heavily sclerotized abdomen, which is usually wider than long and has lateral spines and sclerotized muscle scars (Levi, 1978, figs. 69–72).

Description. The cephalic region is the same color as the thoracic region and is covered by short setae. The sternum is yellow to dark; the legs are dark and ringed and the pattern on the dorsum of the abdomen is variable among specimens of the same species. The venter of the abdomen is gray with a pair of large white patches. *Carepalxis salobrensis* has a wavy black line on its side (a pattern also found in *Ocrepeira* species; Levi, in press). The eyes are subequal and the cephalic region of females is wide, more than half the maximum diameter of the carapace. The abdomen is high and has tubercles (Figs. 4, 8, 9, 15, 16).

The epigynum is heavily sclerotized, triangular to square in *C. salobrensis*, resembling that of *Ocrepeira* (Levi, in press). The southernmost of the three species, *C. camelus*, which has a long, flat scape, is closest to the Australian *C. montifera*.

The only reported male (Simon 1896) is that of the Australian *C. tuberculatus* Keyserling, 1886. Examining Simon's specimens, I found two males which were collected with females (MNHN 17897). One male is 4.5 mm total length, and lacks the carapace humps present in the female; in the location of the humps there are slight swellings in a light field, emphasized by a darker posterior region. The oval abdomen has five pairs of tubercles, although the female of this species has only two pairs, both anterior. The chelicerae of the male are concave, an adaptation to the relatively large palpus. The palpal patella has one macroseta, the endite a tooth, the first coxa a hook, the third and fourth coxae are unarmed. The second tibia has a branch tipped by two macrosetae, as in *Verrucosa* (Levi, 1976, fig. 7). The palpus has a

mushroom-shaped, stalked paramedian apophysis, a long tube-shaped median apophysis (matching the long female scape), and as in *Eriophora*, a narrow cymbium. The terminal apophysis appears fused to the subterminal apophysis and embolus, and the total structure is hinged to the radix. The embolus appears tube-shaped and hidden behind a large lamella (the palpus was not pulled apart).

Relationship. The humps on the carapace and the high clypeus are probably homologous with those of *Scoloderus*, but not homologous to with those of *Gasteracantha*. The coloration, posterior transverse bars on the dorsal side of the abdomen, the black wiggly lines on the sides of the abdomen, and ventral paired white patches on dark (of *C. salobrensis*, Fig. 16), are homologous to those of *Ocrepeira*. The three median posterior tubercles of *C. perpera* are homologous with similar tubercles found in species of *Wagneriana* and *Parawixia*. The absence of these tubercles in two of the species might be due to secondary loss, or perhaps they're not expressed in the adult female in order to provide maximum space for silk glands and eggs.

Distribution. Nine nominal species are known from Australia (Roewer, 1942) and three from the Neotropics.

Misplaced species. The complete citations are in Roewer (1942) and Brignoli (1983).

americanus O. P.-Cambridge, 1889, belongs in *Scoloderus*.

bispinosa Mello-Leitão, 1945, belongs in *Ocrepeira* (Levi, in press).

nigriceps O. P.-Cambridge, 1895, is *Scoloderus cordatus* (Taczanowski), (Levi, 1976).

normalis Keyserling, 1892, belongs in *Scoloderus*. NEW COMBINATION

tuberculifer O. P.-Cambridge, 1889, is *Scoloderus cordatus* (Taczanowski), (Levi, 1976).

KEY TO AMERICAN CAREPALXIS

- 1 Epigynum with a scape more than twice as long as wide (Figs. 1, 3); posterior median plate hidden by lateral plates in posterior view (Fig. 2); Paraguay and northern Argentina*camelus*

- Epigynum with a shorter scape or without scape (Figs. 6, 11, 13); posterior median plate visible in posterior view (Figs. 7, 12, 14)2
- 2(1) Epigynum without scape (Figs. 11, 13); abdomen subspherical with 1 or 2 pairs of anterior humps (Fig. 15); Mexico to Peru and Brazil.....*salobrensis*
- Epigynum with oval scape (Fig. 6); abdomen with 5 pairs of tubercles and 3 median, posterior tubercles (Figs. 8, 9); Baja California, Mexico.....*perpera*

Carepalxis camelus Simon

Figures 1-5; Map 1

Carepalxis camelus Simon, 1895: 157. Two female syntypes from Paraguay, in MNHN no. 193, examined. Roewer, 1942: 865. Bonnet, 1956: 954.

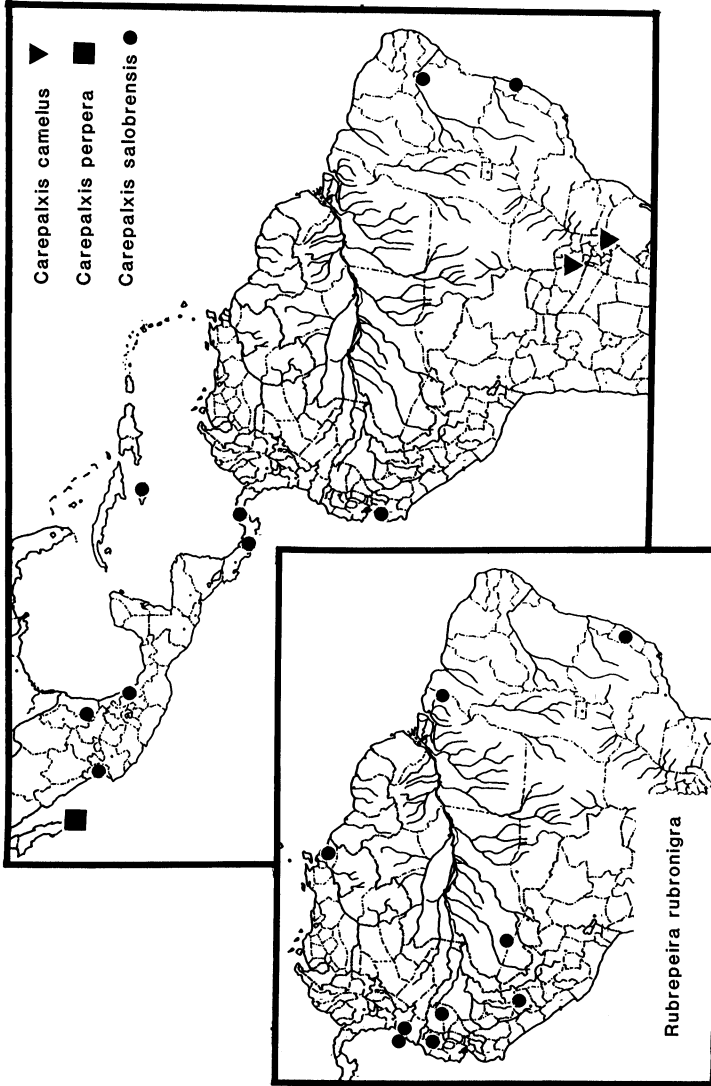
Carepalxis vianai Gerschman and Schiapelli, 1948: 16, figs. 22-25, ♀. Female holotype from Santa María, Misiones Prov., Argentina, in MACN no. 1835, examined. Brignoli, 1983: 264. NEW SYNONYMY.

Synonymy. The structure of the genitalia and body shape of *C. vianai* is as in *C. camelus*.

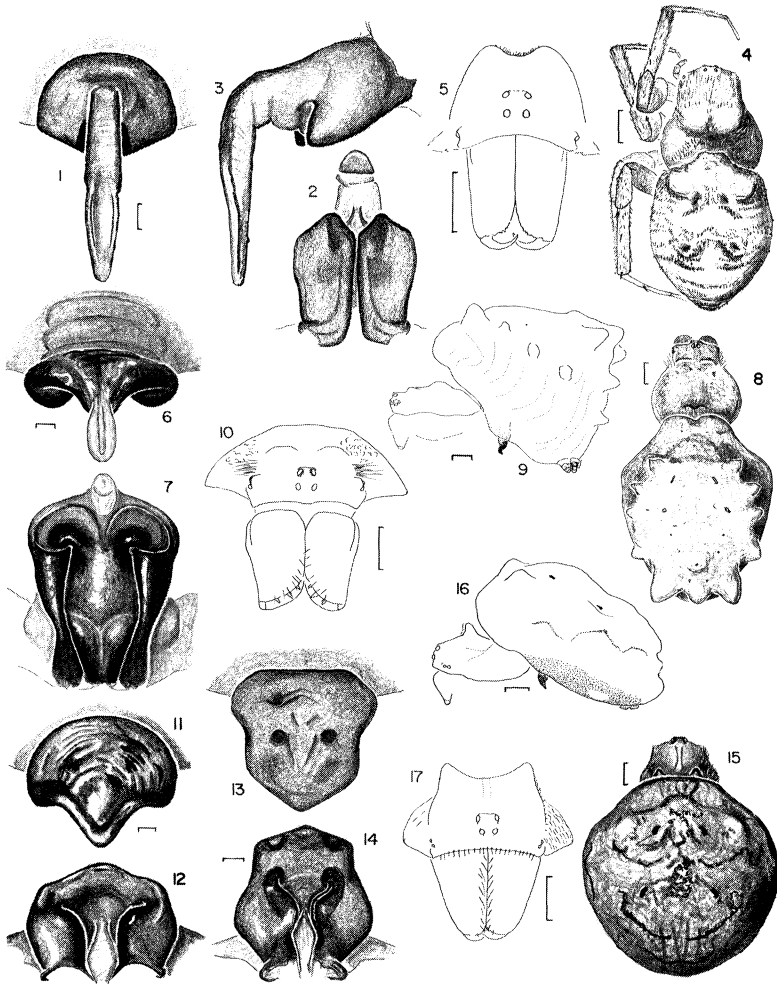
Description. Female holotype of *C. vianai*. Carapace orange with abundant orange setae. Chelicerae orange with dark patch. Sternum light orange. Legs yellow with brown rings. Dorsum of abdomen orange-white with some black spindle-shaped setae; venter whitish with black scales. Eyes subequal in size. Anterior median eyes 1.5 diameters apart. Posterior median eyes two diameters apart. Height of clypeus equals three diameters of anterior median eye. Chelicerae with four teeth on anterior margin, three on posterior. Legs short and thick. Abdomen suboval with anterior humps (Fig. 4). Total length 6.0 mm. Carapace 2.9 mm long, 2.7 wide, behind lateral eyes 1.9 wide. First femur 2.8 mm, patella and tibia 3.1, metatarsus 2.1, tarsus 0.8. Second patella and tibia 3.1 mm, third 2.0, fourth 2.7. First tibia 0.4 mm wide.

Illustrations. Figures 1-5 were made from the holotype of *C. camelus*.

Diagnosis. This species is closest to the type species of the genus *Carepalxis*: *C. montifera* L. Koch of Australia. It differs from the other two American species by having an epigynum with a long scape (Figs. 1, 3) and by the shape of the carapace and abdomen (Figs. 4, 5).



Distribution of *Carepalxis* and *Rubrepeira* species



Figures 1-5. *Carepalxis camelus* Simon, female. 1-3, epigynum. 1, ventral. 2, posterior. 3, lateral. 4, dorsal, 5, eye region and chelicerae.

Figures 6-10. *C. perpera* (Petrunkevitch), female. 6, 7, epigynum. 6, ventral. 7, posterior. 8, dorsal. 9, lateral. 10, eye region and chelicerae.

Figures 11-17. *C. salobrensis* Simon, female. 11-14, epigynum. 11, 13, ventral. 12, 14, posterior. 11, 12, (from Tepic, Mexico). 13, 14, (from Jamaica). 15, dorsal. 16, lateral. 17, eye region and chelicerae.

Scale lines, 1.0 mm, genitalia 0.1 mm.

Specimens Examined. The species is known only from the type specimens of the two names.

Carepalxis perpera (Petrunkevitch), new combination

Figures 6–10; Map 1

Epeira perplexa Banks, 1898: 251, pl. 15, fig. 1, ♀. Female holotype from Sierra San Nicolas [Cerro San Nicolas], Baja California [Sur], Mexico, in CAS, destroyed in California earthquake of 1906. Name preoccupied by *Epeira perplexa* Walckenaer, 1842: 101 (a *Cyclosa*).

Araneus perperus Petrunkevitch, 1911: 309. New name for *E. perplexa* Banks. Bonnet, 1955: 565.

Aranea perpera: – Roewer, 1942: 849.

Note. Banks illustrated the original female. It has a longer scape than the only adult specimen examined. Banks' specimen may have been an immature before its last molt which, in some species of araneids, has a soft scape.

Description. Female from S Miraflores, Baja California Sur. Carapace orange with long white setae behind eyes and fine curly setae on sides of thorax (Fig. 8). Chelicerae orange-brown. Labium brown, endites orange. Sternum dusky in center, sides orange. Coxae orange with brown patches; legs orange with brown rings, patellae darkest. Dorsum of abdomen grayish white (Fig. 8); venter grayish white. Posterior median eyes same diameter as anterior medians, laterals 0.8 diameter. Anterior median eyes 1.6 diameters apart. Posterior median eyes 1.5 diameters apart. Ocular quadrangle slightly narrower behind than in front. Height of clypeus equals 1.5 diameters of anterior median eye. Abdomen with four pairs of lateral humps and three median posterior humps (Fig. 8). Total length 15.5 mm. Carapace 5.5 mm long, 4.4 wide, behind lateral eyes 2.7 wide. First femur 5.4 mm, patella and tibia 7.3, metatarsus 4.2, tarsus 1.5. Second patella and tibia 6.4 mm, third 3.6, fourth 5.6.

Illustrations. Figures 6–10 were made from the only adult female available.

Diagnosis. *Carepalxis perpera* differs from the two other American species by having the abdomen with five pairs of lateral tubercles and three posterior median dorsal tubercles (Figs. 8, 9) and by the wide, elongate, posterior median plate of the epigynum (Fig. 7).

Specimens Examined. MEXICO Baja California Sur: 8 km S Miraflores, 11 July 1938, ♀ (A. E. Michelbacher, E. S. Ross, CAS); "cape region", imm. (N. Banks, MCZ).

Carepalxis salobrensis O. P.-Cambridge

Figures 11–17; Map 1

Carepalxis salobrensis Simon, 1895: 157. Immature holotype from Rio Salobro, [Bahia State], Brazil, in MNHN no. 8494, examined. Roewer, 1942: 865. Bonnet, 1956: 954.

Carepalxis gibbosa O. P.-Cambridge, 1889: 48, pl. 4, fig. 10, imm. Immature holotype from Bugaba, [Chiriquí Prov.], Panama, in BMNH no. 1905.4.28.3212, examined. Keyserling, 1892: 54, pl. 2, fig. 43, imm. Roewer, 1942: 865. Bonnet, 1956: 954. NEW SYNONYMY

Carepalxis rotunda O. P.-Cambridge, 1896: 224, pl. 27, fig. 7, imm. Immature holotype from Atoyac, Veracruz State, Mexico, in BMNH no. 1905.4.28.3213, examined. Roewer, 1942: 865. Bonnet, 1956: 954. NEW SYNONYMY

Carepalxis eremita Archer, 1966: 131, pl. 1, fig. 2, 3, ♀. Female holotype from Hermitage Reservoir, Jamaica, in AMNH, examined. Brignoli, 1983: 264. NEW SYNONYMY

Synonymy. The *C. salobrensis* holotype is 5.8 mm long, with carapace 2 mm wide; the *C. rotunda* holotype is 4.5 mm long, with carapace 1.7 mm wide; the *C. gibbosa* holotype has the carapace 2.0 mm wide. Both *C. rotunda* and *C. gibbosa* holotypes are in two parts and damaged by insect pins. The shape of the abdomen, the carapace bulges, and the concavity between the carapace bulges are the same as those of the mature specimen from Tepic, Mexico, which is illustrated (Figs. 15–17). An adult female confirms that the species is found as far south as Bahia State, Brazil. This adult is very similar in marks, color and structure to the holotype of *C. salobrensis*. Its epigynum is like that illustrated of the specimen from Jamaica (Figs. 13, 14).

Description. Female from Tepic, Mexico. Carapace dark orange with white setae. Chelicerae orange-brown with dark patch. Labium, endites brown. Sternum orange with white pigment underneath transparent exoskeleton and dark border. Coxae dark orange; legs orange with dark rings and streaks. Dorsum of abdomen whitish with dusky and black marks (Fig. 15); venter black with a pair of white patches their diameter apart (Fig. 16). Posterior median eyes same diameter as anterior medians, laterals 0.7 diameter. Anterior median eyes 0.9 diameter apart. Posterior median eyes two diameters apart. Ocular quadrangle wider behind than in

front. Height of clypeus equaling almost two diameters of the anterior median eye (Fig. 17). Abdomen with a pair of lateral humps and a smaller confluent pair in between and slightly anterior (Fig. 15). Total length 9.8 mm. Carapace 4.1 mm long, 3.7 wide, behind lateral eyes 2.5 wide. First femur 4.1 mm, patella and tibia 5.0, metatarsus 3.4, tarsus 1.1. Second patella and tibia 4.7 mm, third 2.9, fourth 4.4. Second tibia in dorsal view 0.7 mm wide.

Variation. Total length of females 7.6 to 11.8 mm. None of the five adult females have the outline of the epigynum in ventral view alike (Figs. 11, 13). Most have the outline of the epigynum closer to the specimen from Jamaica (Figs. 13, 14) than the one from Mexico. The posterior face of the epigynum varies only in the width of the median plate (Figs. 12, 14). The adult female from Bahia State, Brazil and the holotype of *C. salobrensis* are the only ones lacking two white patches on the underside of the abdomen. Illustrations were made from the female from Tepic, Mexico, and Figures 13, 14 from the holotype of *C. eremita* from Jamaica.

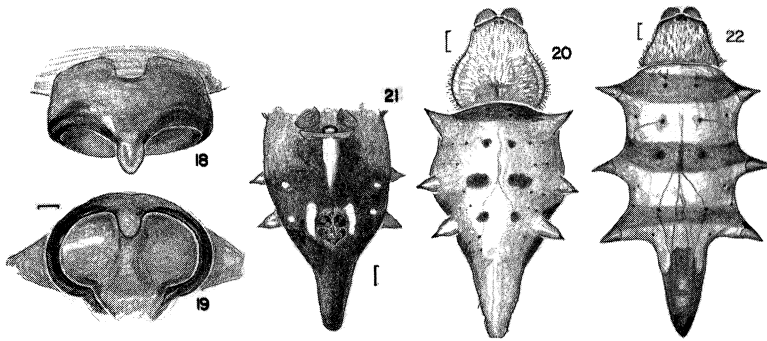
Diagnosis. The shape of the abdomen, round in outline with one or two pairs of anterior dorsal humps (Fig. 15), and the posterior view of the epigynum (Figs. 12, 14) separate this from the other *Carepalxis* species.

Specimens Examined. MEXICO *Tamaulipas*: 1.5 km E Santa María Guadalupe, 43 km E Tula, 320 m, 8 June 1983, imm. (W. Maddison, MCZ). *Nayarit*: Tepic, 26 July 1953, ♀ (P. & C. Vaurie, AMNH). PANAMA *Panamá*: Forest Reserve, Aug. 1936, early instar imm. (A. M. Chickering, MCZ); Barro Colorado Isl., Lago Gatún, 16 June – 15 July, 1934, imm. (A. M. Chickering, MCZ). PERU *Tumbes*: Lechugal, 2♂ (K. Jelski, J. Sztolcman, PAN). BRAZIL *Bahia*: Fazenda Goiarema, Mucurí, 14 May 1979, ♀ (A. C. Niella, MCN 10125).

Rubrepeira new genus

The type species is *Verrucosa rubronigra* Mello-Leitão. The generic name is an arbitrary combination of letters attached to *Epeira*, and is feminine.

Diagnosis. This genus is close to *Alpaida* and *Wagneriana* (and also the African *Megaraneus* Lawrence, 1968) but differs by having a low, flat, setose carapace and by the unusual shape of the



Figures 18-22. *Rubrepeira rubronigra* (Mello-Leitão), female. 18, 19, epigynum. 18, ventral. 19, posterior. 20, 22, dorsal. 21, ventral.

Scale lines, 1.0 mm, genitalia 0.1 mm.

abdomen, which has only one posterior median projection and three pairs of lateral spine-shaped projections (Figs. 20-22).

Note. The large size of the females and the complete absence of male or last instar males in collections suggests that the male might be dwarfed. Since the shape of the epigynum resembles that of *Alpaida* and *Wagneriana* females, I expect the male palpus to be similar to that of males of these genera or perhaps less complex because of its small size. Based on the palpal characters of *Alpaida* and *Wagneriana* I expect the following: a paramedian apophysis on the side of the conductor pointing toward the radix; the conductor attached some distance from the rim of the tegulum; small distal hematodocha between embolus and terminal apophysis; median apophysis without large hooks or spines and directly attached to the tissue behind the radix (not as in *Araneus* relatives, with the attachment offset behind the median apophysis).

This species can not be placed in *Verrucosa* because *Verrucosa* species do not have as flat a carapace; *Verrucosa* have an abdomen as wide as long or wider than long; it is widest anteriorly and usually bears a line of three median posterior tubercles. The *Verrucosa* epigynum has a long scape usually hinged anteriorly (Levi, 1976; Lise, in preparation).

Only one species, *R. rubronigra*, is known.

Rubrepeira rubronigra (Mello-Leitão), new combination

Figures 18–22; Map 1

Verrucosa rubronigra Mello-Leitão, 1939: 110, figs. 12, 13. Immature female holotype from Colatina, Espírito Santo State, Brazil, in MNRJ, lost. Roewer, 1942: 879. Bonnet, 1959: 4791.

Acrosoma riscoi Archer, 1971: 158, figs. 3, 4, ♀. Female holotype from Cueva de la Pava, Tingo María, Depto. Huánuco, Peru, in AMNH, examined. NEW SYNONYMY

Note. A. A. Lise (*in litteris*) confirmed that the holotype of *V. rubronigra* could not be found. However an immature paratype of the name, from Guyana, belonging to the BMNH, was available.

Archer placed this species in *Acrosoma*. *Acrosoma*, with the type species *A. swainsoni* Perty (designated by F. P.-Cambridge, 1904: 525) is a subjective synonym of *Micrathena* Sundevall with the type species *M. clypeata* Walckenaer (Levi, 1985: 440).

Description. Female from Cauca, Colombia. Carapace orange with white hair, area between eyes darker, light band on each side of thoracic region. Chelicerae orange. Labium, endites orange-black. Sternum orange-black. Coxae, legs orange-black. Dorsum of abdomen whitish with paired black marks, lateral spines orange (Figs. 20, 22); venter black with white median streak and white patch on each side of spinnerets (Fig. 21). Cephalic region of carapace low. Eyes subequal. Anterior median eyes their diameter apart. Posterior median eyes slightly more than their diameter apart. Abdomen with three pairs of lateral spines and a posterior median projection (Figs. 20–22). Total length 19 mm. Carapace 5.3 mm long, 4.8 wide. First femur 8.0 mm, patella and tibia 8.1, metatarsus 5.9, tarsus 1.9. Second patella and tibia 7.3 mm, third 4.1, fourth 7.2.

Variation. Total length of females 15 to 20 mm. Many females, including the holotypes of both names, have transverse dorsal black bands on red, six orange spines, and black posterior spine (Fig. 22). Between the red and black bands is a narrow yellow line. Figures 18–21 were made from a female collected in Depto. Cauca, Colombia, Figure 22 from the holotype of *A. riscoi*.

Diagnosis. The bright coloration as well as the ventral markings of the abdomen (Figs. 20–22) are diagnostic.

Natural History. W. Eberhard reports (*in litteris*) that the female collected by K. Mullen came from a more or less horizontal web, 2 m above ground in mangroves. An immature paratype of *V.*

rubronigra from Guyana came from a *Sceliphron fistulare* (Dahlb.) wasp nest together with *Alpaida trispinosa* (Keyserling). The immature from Montalvo, Ecuador came from a sphecid wasp nest.

Specimens examined. MEXICO 150 km NE of Barranco [?], 1 Aug. 1958, ♀ (A. S. Menke, AMNH). GUYANA imm. (BMNH). VENEZUELA *Delta Amacuro*: Caño Jobure, 7 April 1955, ♀ (J. J. Wurdack, AMNH). COLOMBIA *Cauca*: Isla Gorgona, Pacific Ocean, Feb. 1961, ♀ (F. Medem, H. D. Cameron Coll.); Borbona Island Town [?], 5 m, ♀ (M. Barreto, MCZ); Guapí, Aug. 1975, ♀ (W. Eberhard, K. Mullen, MCZ). ECUADOR *Pichincha*: Rto. A. Perez Intriago, km 113, Via Puerto Quito, 1 June 1985, imm. (T. Gramizo, MECN). *Pastaza*: Montalvo, 14 Aug. 1985, imm. (D. Bástidas, MECN). BRAZIL *Pará*: Rio Gurupi, 10–26 Apr. 1963, imm. (B. Malkin, MZSP 3362). *Amazonas*: mouth of Rio Embira, Rio Juruá, 1933, imm. (B. A. Krukoff, AMNH).

SUMMARY

There are three species of *Carepalxis* in America: *C. camelus*, *C. perpera* and *C. salobrensis*. Only females of these species are known. *Carepalxis vianai* is synonymized with *C. camelus*; *C. gibbosa*, *C. rotunda* and *C. eremita* with *C. salobrensis*. *Carepalxis bispinosa* belongs in *Ocrepeira*; *C. normalis* in *Scoloderus*. The new genus *Rubrepeira* is for *Verrucosa rubronigra*. *Acrosoma riscoi* is a synonym of *R. rubronigra*.

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