

THE SPIDER GENUS *LOXOSCELES*
IN SOUTH AMERICA
(ARANEAE, SCYTODIDAE)

WILLIS J. GERTSCH

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INTRODUCTION

THE SEDENTARY WEAVERS of the genus *Loxosceles* are spiders of wide temperate and tropical distribution. Native species are at present known only from two principal centers—Africa and the Americas. About 17 species range from temperate South Africa northward through the tropics of that continent into the Mediterranean region and southern Europe. Only two of these species live in the warmer parts of Europe. *Loxosceles* is strongly represented in the Americas, with about 50 species now known from temperate and tropical North and South America. Eighteen species were listed by Gertsch (1958) from North America, Central America, and the West Indies, and the present paper considers 30 species from South America.

The genus *Loxosceles* is represented in other areas only by the ubiquitous species *rufescens*, which has been transported by commerce and seemingly established in many countries of the Middle East and the Orient and in parts of the United States. *Loxosceles rufescens* has not been reported, at least on the basis of authentic specimens, from South America, but its eventual discovery on that continent is to be expected.

Some American species are also known to be readily transported by commerce. *Loxosceles laeta* has been disseminated widely from what was probably its presumed point of origin in western South America to many parts of eastern South America and to Guatemala and Honduras in Central America. It has appeared recently in such widely separated points in North America as Vancouver, British Columbia, Toronto, Ontario, and Cambridge, Massachusetts. There is some reason to believe that these introductions may result in the establishment of the species in suitable stations in the north. The population found in a building in Cambridge, Massachusetts (Levi and Spielman, 1964), was represented by more than 50 individuals and may have existed in the building for many years.

The brown spider, *Loxosceles reclusa*, a venomous species of the south and central United States, is generally believed to have spread beyond its normal range during recent

years. Specimens are now known from as far north as Bloomington and Indianapolis, Indiana. It is reported to have become more numerous and to be found more frequently around and in buildings where it was scarcely noticed a few years ago. This trend toward a more domestic life probably would contribute toward its wider dispersal and also improve its ability to survive in cooler climates. Whereas the increase in numbers of this species in recent years is probable, it may represent a cyclical phenomenon. There was very little exact information available on the distribution and habits of *Loxosceles reclusa* before its recent indictment as a spider of medical importance. Without this basic background, generalizations on habits and numbers are debatable.

The loxoscelines are shy, sedentary spiders that are active mostly at night. They spin a large, irregular web with thick, quite sticky threads and place it in some dark situation. The spider remains in the web, which serves both as retreat and snare, and continues to lay down silk as long as it is productive of prey or until the spider dies. The web of *Loxosceles laeta* in Cambridge, Massachusetts, has been described (Levi and Spielman, 1964) as a platform of coarse silk occasionally 30 cm. in diameter, surmounted with a smaller canopy connected by numerous lines to the lower platform. The web grows by accretion to become a thin blanket, in the lower layer of which insect remains are buried and in the denser portion of which the loosely woven egg sac containing about 50 eggs is placed. In São Paulo, Brazil, Bücherl (1961) has provided some biological data for *laeta* and *gaucho* (called *rufipes* and *rufescens*, respectively). The webs of these species, when placed in the inner spaces of bricks or tiles, vary from 4 cm. to 8 cm. in diameter and are 1 cm. thick. The discoidal egg sacs of these species, from females reared in his laboratory, were about 2 cm. in diameter and contained 12 to 15 eggs. Bücherl concluded that the average life span of his species was one and one-half years. Females outnumbered males by six or seven to one in his cultures, but this ratio is not likely to represent the actual sex ratio for the spe-

cies, which probably is one of essential equality for both sexes, as it is for most spiders.

The loxoscelines occupy a great variety of habitats in natural and domestic situations. Many live under rocks, tree trunks, and ground litter of all kinds, under loose bark and in holes of trees, in natural openings of cliffs and banks, under piled rocks of talus slopes and stream banks, and similar habitats. Some live under rocks in hot, arid regions, whereas others seem to prefer microhabitats providing at least a moderate amount of humidity. Many live in caves, where they place their webs under rocks and litter on the floor or in crevices in the walls, but no species is definitely known to be an obligative cavernicole. Man provides ideal habitats for the loxoscelines in and around his buildings. They move into such outbuildings as barns, chicken coops, garages, storage sheds, and into his homes as well. Inside buildings they become situated under furniture and objects of all kinds, in crevices in the floors and walls, in the angles and corners of the rooms, in closets, in bureau drawers, under picture frames, and in clothing hanging on the walls. Piled bricks, tile, building stones, lumber, and equipment of any kind provide additional habitats. Almost any species of *Loxosceles* will accept such domestic habitats if they become available. *Loxosceles spadicea* lives in houses at 4000 meters (12,500 feet) in La Paz, Bolivia. Two other species in South America, *laeta* and *gaucho*, and the North American *reclusa* abound in domestic habitats at medium or low altitudes. In Chile *laeta* is called *araña de los rincones*, or corner spider. The loxoscelines are solitary animals, but, in all stages of development, they tend to cluster together in favorable habitats. Bücherl (1961), in April, collected nearly 700 spiders from under bricks and tiles near the walls of a small house in a suburb of São Paulo. The degree of infestation of these spiders is often in inverse ratio to the neatness and cleanliness of the property owner. In areas where *Loxosceles* are a medical problem, control can be achieved by periodical house cleaning. The following measures were recommended by Schenone and Reyes (1963) in Chile where the incidence of spider poisoning remains high:

"1. Thorough house cleaning at least twice

a year, paying special attention to dark corners, closets, attics and the like. Furniture, curtains, pictures, as well as clothes, trunks and other baggage, kept in closets, must be completely removed and thoroughly cleaned.

"2. It is advisable to place beds at least 8 inches away from walls. Clothing should not be hung on walls; in any case, it must be carefully inspected before putting on."

The medical importance of the species of *Loxosceles* has engaged the attention of researchers since 1934 when Machiavello first demonstrated that the bite of *Loxosceles laeta* caused a severe cutaneous necrosis in man. Excellent summaries of the symptoms and treatment of loxoscelism, or cytotoxic necrosis, in North and South America can be found in papers by Macchiavello (1937), Schenone and Prats (1961), Schenone and Reyes (1963), Bücherl (1961), Atkins, Wingo, Sodeman, and Flynn (1958), and Lessenden and Zimmer (1960). Comprehensive bibliographies are available in some of these papers. At the present time four species of *Loxosceles* (*laeta*, *gaucho*, *reclusa*, and *rufescens*) are known to be venomous, but it seems probable that the venoms of all species of the genus are toxic.

The shy, lucifugous members of *Loxosceles* make every attempt to escape when they are surprised in their hidden habitats. I have picked up hundreds of specimens with my fingers without any seeming effort of the spiders to bite me. These spiders never search for man in order to suck his blood, as do the mites and many kinds of insects. Any spider bite is always a pure accident, possible only under special circumstances. Some of these conditions are met when spiders live in close contact with man in his home or in his work areas. The loxoscelids crawl into beds and into clothing and become imprisoned in the folds of clothing of persons sleeping or dressing. On these occasions the spider's instinct to escape cannot be realized, and, if held too tightly, it sometimes responds by biting.

The loxoscelids use their chelicerae for biting in typical spider fashion. The very short fangs, which are attached to stout basal segments capable of limited lateral motion, are jabbed into the victim and leave two tiny punctures. Venom from large endocephalic glands is introduced into the wound simul-

taneously and continues for the duration of the bite. At the same time digestive juices from glands near the mouth may be voided to the area of the bite, inasmuch as biting and feeding are related, essentially simultaneous actions. The venom of *Loxosceles* contains powerful cytotoxins, neurotoxins, and haemotoxins. The digestive fluids from glands near the mouth contain enzymes that digest tissues of the prey. Whether these fluids have any important effect during the bite is unknown. Because of the small size of the chelicerae of *Loxosceles*, the actual penetration of the skin is very superficial. It has been suggested that this is a favorable condition for development of the cytotoxic syndrome, and that deeper penetration or bites in areas of better blood supply reduce the severity of the symptoms.

In the United States the brown spider, *Loxosceles reclusa*, most often bites people when they are putting on clothing or lying in bed. The victim first feels a stinging sensation like that of a mosquito or ant bite. After a few hours an inch-wide swelling develops, and there is gradual increase in pain, sometimes to considerable severity. Within a few days the area darkens and forms a black gangrenous spot. In about two weeks the skin gradually sloughs away, leaving an ugly, depressed ulcer. Healing is slow and may not be complete for five or more weeks. The South American *araña de los rincones* (*Loxosceles laeta*) seems to be far more venomous than the brown spider. Systemic effects occur in a considerable number of cases, and about half of these have resulted in fatality. One death has been charged so far to *Loxosceles reclusa* in the United States.

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HISTORICAL REVIEW OF *Loxosceles* IN SOUTH AMERICA

The first mention of a species of the genus *Loxosceles* in South America was by Walckenaer (1842) in his "Histoire naturelle des insectes Aptères." In that work he casually and purposefully changed the name of *Scytodes rufipes* Lucas, which was cited in the synonymy, to *Scytodes omosites* Walckenaer, a previously unpublished combination he had reserved for the species in another place. He also revised the distribution to include both French Guiana and Guatemala. A discussion of this issue was presented by Walckenaer (1845) with the publication of his own letter and one of response by Lucas. The name *omosites* has since been held to be a synonym of *rufipes*, in spite of the fact that Walckenaer's description, based on specimens sent to him from French Guiana by Leschenault and Doumerc, shows that he had before him a species possibly different from that of Lucas.

Inasmuch as assignment of the name *omosites* (now a synonym for nearly 100 years) would be difficult without the actual material on hand, there seems to be no legal requirement and little reason to try to modify the placement. To put it in other words, Walckenaer's *omosites* falls as a synonym, even though the description may not be based on the Central American *rufipes* except through inclusion of the bibliographic reference.

It is clear, then, that the species *rufipes* was attributed to South America only on the basis of this early illegal action by Walckenaer. His material actually represented a now-unidentifiable species of which the leg formula was likely the same, 2413, as that of *rufipes* ("La seconde paire, qui a 9 lignes, est plus longue que le quatrième"). The first credible appraisal of the species Lucas described as *Scytodes rufipes* from Guatemala was given by F. Pickard-Cambridge, in 1899 (1897-1905), who said: "There is very little doubt that the specimens of *Loxosceles* taken by Sarg in Guatemala are identical with the species of which a figure of the eyes and another of the spider itself are given by Lucas." Up to the present time, *rufipes* has been recorded from the South American continent only on the basis of spurious material. It is now possible to report the presence of *Loxosceles rufipes* (Lucas) from Colombia on the basis of specimens from near Sasaima, Cundinamarca, collected in March and April of 1965.

In spite of F. Pickard-Cambridge's very explicit assignment of *rufipes* to the Guatemalan species most likely to represent it, and his action as first reviser giving it added validity, the name has been used questionably and erroneously by many students of the North and South American fauna, as follows: by Nicolet (1849), by Keyserling (1877), and by Bücherl (1960, 1961), for *Loxosceles laeta* (Nicolet); by Simon (1907) and by Chamberlin (1920), for *Loxosceles unicolor* Keyserling; by Petrunkevitch (1925), for *Loxosceles panama* Gertsch; by Mello-Leitão (1918, 1934), for *Loxosceles bicolor* Holmberg; by Franganillo Balboa (1935), for *Loxosceles cubana* Gertsch; by Mello-Leitão (1934), for *Loxosceles gaucha*, new species; and by Jones (1936), for *Loxosceles reclusa* Gertsch and Mulaik.

The first serious student of South Ameri-

can spiders was a Frenchman, H. Nicolet, who published in 1849 a large work on Chilean spiders, as part of Gay's "Historia física y política de Chile." Nicolet recorded *Scytodes rufipes* Lucas from Chile on the basis of the inadequate descriptions of Lucas and Walckenaer, and cited the range as "Chile, Guayana-Méjico y Guatemala." *Scytodes laeta* and *S. nigella* were new species based only on female or young specimens. Verbal descriptions and excellent illustrations of the three presumed species (these latter published separately; see Nicolet, 1854) make it quite clear that all belong to the genus *Loxosceles*. A dorsal view of the spider, a figure of the eyes, and a chart of the leg relations were offered for the three taxa. It seems clear that Nicolet first intended to give the name *flavescens* to his *rufipes* and then failed to eliminate the unwanted name. Much later (1893b, p. 272) Simon used this *nomen nudum* for *laeta* Nicolet.

The first comprehensive survey of the South American *Loxosceles* was by Simon (1907), who listed eight species (three of which were described as new) and offered a key to, and illustrations of, the five males then known. Although this paper was presented in the succinct style of Simon, the males of all the species are readily identifiable on the basis of the data presented. In this paper, the identity of *laeta* was established for the first time by unmistakable data, and Nicolet's *rufipes*, *laeta*, and *nigella* were regarded as being the same species. There is good reason to believe that Nicolet's specimens were in the hands of Simon at that time, and that they are still part of the collection of the Muséum National d'Histoire Naturelle, in Paris, where many of Nicolet's species are still preserved. Simon's assignment of *Loxosceles similis* Moenkhaus (1899), with a question mark (?), to the synonymy of *laeta* was later shown to be an error by Camargo (1953) who properly substituted *similis* for Simon's *surata*. Simon regarded *laeta* as a species widespread in Chile, Argentina, and southern Brazil.

Simon (1907) seemed unaware of the action of F. Pickard-Cambridge in fixing the name *rufipes* to the logical species from Guatemala. Instead, he gave the name a very different connotation by assigning to it, as a syn-

onym, *unicolor* Keyserling, a species of the *reclusa* group in which the tarsus of the palpus is transverse ("*Tarsus transversus, multo latior quam longior, intus prominulus et obtusissimus*"). Simon's *rufipes* is a species widespread in the "southern United States, Central America, and South America, at least east of the Andes." Since no member of the *reclusa* group occurs in South America, and only two of the species reach Guatemala in Central America (*yucatana* and *boneti*), it is clear that Simon drew his distribution data mostly from the literature. Simon's identifications of both *laeta* and *rufipes* were followed by Chamberlin (1920), who modified his key to include a new species, *accepta*.

Descriptions or mentions of other South America *Loxosceles* by Holmberg (1876), Keyserling (1877), Banks (1902), Strand (1914), Chamberlin (1920), and Mello-Leitão (1938) contribute only supplementary data to the problem.

In 1918, Mello-Leitão reviewed the genus *Loxosceles* in Brazil and identified still another species as *rufipes* Lucas. This was made quite explicit in his 1934 paper. Males of four of the five known species were available, and acceptable illustrations of the palpi were offered. The palpus of *rufipes* belongs to the well-known species from Argentina and southern Brazil for which the name *gaucho* is used in the present paper. The species called *laeta* is the same as that so named by Simon (1907). This interpretation of *laeta* and *rufipes* has been accepted by most South American students, notably Camargo (1953) and Bücherl (1952), until recent years.

Bücherl's work on the South American *Loxosceles* has been concerned largely with the venomology and medical status of these spiders. His views on the systematics were presented in three principal papers (1961, 1964a, 1964b). These are, to some extent, repetitious in coverage, but in the most recent one (1964b), his conclusions were summarized in cryptic fashion. In all his abundant material from Chile, Peru, Uruguay, Argentina, and from dozens of localities in Brazil (all carefully listed in the paper and, in his opinion, offering a faithful picture of the loxoscelids truly existing in all the large South American continent), he found only three morphologically distinct and undoubted spe-

cies: *Loxosceles rufescens* (Dufour), *L. rufipes* (Lucas), and *L. spadicea* Simon. A fourth species, *Loxosceles lutea* Keyserling, was tentatively accepted as valid on the basis of a verbal description and the details of the leg measurements. Fifteen specific names proposed over a hundred-year span by workers were placed as synonyms of these four species and five names were listed as of uncertain placement. In an earlier paper, Bücherl expressed amazement that arachnologists had needed as many as 30 names to cover the world fauna of this monotonously uniform group of spiders. Four good species for all of South America represented a simple solution to a complex problem.

Completely different conclusions have been reached by me as to the number of valid species occurring in South America and the names that should be applied to them. About 30 species are recognized and described in the following systematic treatment. Included as perfectly valid species are many of those summarily synonymized by Bücherl without benefit of study of types or topotypical material. His three well-marked Brazilian species were dressed in unsound nomenclature. He used the name of a widespread species (*rufescens*) never found in South America for a Brazilian spider distinct from it in many features. He professed to see no difference between his own figures (Bücherl, 1964b, p. 38, figs. 1a-1d) and those of *rufescens* in my paper (Gertsch, 1958, figs. 60-62) and used the name without having studied an authentic specimen. His insistence on using *rufipes* for the widespread, venomous species *laeta*, in spite of abundant evidence of its unavailability, betrays an unawareness of taxonomic practices. Finally, even the third name (*spadicea*) must be applied to a spider from the high mountains of Bolivia and not to any species known to occur in Brazil at present. Instead, his illustrations were of the spider called *intermedia* (= *ornata*) by Mello-Leitão.

Bücherl's simplistic solution of the difficult problem of the South American *Loxosceles* results from a failure to discriminate between closely related species and from a reliance on three or four characters to solve all problems. Subsidiary features, such as color pattern, comparative leg lengths beyond mere leg formulas, eye size and their arrangement, and

supporting differences in both male and female genitalia beyond gross pattern, were all brushed aside as meaningless. The result is what seems to me to be a most imperfect picture of the fauna.

Bücherl's conservatism is also reflected in his analysis of the species described by me from North and Central America (Gertsch, 1958). He confessed with frankness his inability to distinguish between such pairs of species as *reclusa* and *devia* (Gertsch, 1958, figs. 21-23 and 24-26), *arizonica* and *unicolor* (*ibid.*, figs. 27-29 and 30-32), *yucatanica* and *zapoteca* (*ibid.*, figs. 33-35 and 36-38), and *boneti* and *bolivari* (*ibid.*, figs. 39-41 and 42-44) on the basis of what he called excellent illustrations of the male palpi. Similarly, he was not convinced that differences in the seminal receptacles of the females offered valid features for separation of the species. He denied that *arizonica* (*ibid.*, fig. 90), or any species, has six seminal receptacles and suggested that these and other figures were a reflection of errors in technical preparation. Finally, he thought it desirable, perhaps, to regard these populations as merely regional types or polytypic expressions of few species.

It is not my intention, in a paper dealing with a different fauna, to defend the status of these North American species, except in general terms. First, I should say that the illustrations were to some extent diagrammatic, are less detailed than desirable, and that a key, easily possible even with these closely allied taxa, should have been offered. However, other students have been able to differentiate readily between these taxa on the basis of the same data. Some of these species are sympatric, live close together over wide areas while maintaining their morphological integrity, and fulfill all reasonable requirements for specific distinctness. Bücherl's opinions lack merit when not based on the full data before him, in this case the actual specimens of the species concerned. *Loxosceles unicolor* Keyserling, based on a male from New Mexico, belongs to the *reclusa* group, which barely reaches the northern part of Central America and has no representative in any part of South America. Nevertheless, Bücherl casually synonymized *unicolor* with *lutea* Keyserling of Colombia, without having seen the material studied by Keyserling,

or any specimens from New Mexico. It seems clear that Bücherl's contributions to spider systematics are based on concepts quite different from those of conventional arachnologists and offer little useful information to such students.

In 1934 Macchiavello showed that cutaneous arachnidism in Chile was caused by a spider of the genus *Loxosceles*. Some of his specimens from Antofagasta, Chile, were studied by C. Mello-Leitão of Brazil and N. Banks of the United States, who independently concluded that they represented *Loxosceles laeta* (Nicolet). The original specimens sent to Banks are still in the collections of the Museum of Comparative Zoology of Harvard University and in the American Museum of Natural History. Since 1934 the name *Loxosceles laeta* (Nicolet) has been used consistently in an ever-growing volume of medical literature dealing with the spider that causes the dreaded *loxoscelismo*. A challenge to this usage was made recently by Bücherl (1960) who claimed that the name *rufipes* must be used for the virulent spider. A refutation of this conclusion was given by Gertsch in 1961, and a discussion of the issues is presented in the following section.

DISCUSSION OF *Loxosceles laeta* (NICOLET) AND *Loxosceles rufipes* (LUCAS)

In 1960, Bücherl came to some startling conclusions regarding the identity of the Nicolet species of *Loxosceles*. He noted what seemed to be gross discrepancies in the characters attributed to *laeta* and denied that the species was properly placed in the section "Deprimidas." Instead he declared that *Scytodes laeta* Nicolet was a completely inoffensive spider and belonged not in *Loxosceles* but to the genus *Scytodes* of the section "Gibosas." He charged that arachnologists had misinterpreted Nicolet's statements and that Simon had no authority to establish the synonymy now so long followed by students. He concluded that the spider that causes *Loxosceles* poisoning (loxoscelism) in Chile was *Loxosceles rufipes* (Lucas), 1834.

Modern systematists are inclined to be practical in their approach to matters of nomenclature and hold stability of names as a principal goal. They are intolerant of changes that contribute nothing new and recognize

that author credits are necessary only for reasons of reference and bibliography. The new Code provides various ways for maintaining names of long standing, even though on occasion objections may be raised against their validity. The rejection of the name *Loxosceles laeta* (Nicolet), for 50 years widely used in biological and medical literature, and the substitution of *rufipes* for the venomous South American species on the basis of trivial discordances in the verbal description rest on flimsy grounds. They represent an unwise and unnecessary disturbance of the nomenclature of this important genus.

In 1961 Gertsch was prompted to review the status of *laeta* and arrived at completely different conclusions on all points. At the outset it became clear that Bücherl had before him only half the evidence when he studied the problem and had failed to consult the excellent illustrations provided by Nicolet (1854). These showed unmistakably that *Scytodes laeta* is truly a member of the section "Deprimidas" and of the genus *Loxosceles*. The minor points of seeming discrepancy extracted from the description by Bücherl to prove that *laeta* belonged in *Scytodes* are not incongruous when viewed in their proper context. The verbal description described the carapace as possessing a broad and deep median groove ("el hoyuelo longitudinal ancho y profundo"), a feature ignored by Bücherl even though he was assigning *laeta* to a genus lacking this groove. *Scytodes laeta* Nicolet is clearly a very typical member of the genus *Loxosceles* and identifiable as such by the excellent figures.

Inasmuch as Bücherl's case rests largely on assignment of *laeta* to the genus *Scytodes*, it falls apart when it can be proved unequivocally that the species belongs in *Loxosceles* (as is now perfectly clear). In 1960 Bücherl insisted that *laeta* was an inoffensive *Scytodes* ("se adapta totalmente al género *Scytodes* y no a *Loxosceles*"), whereas in 1962 he declared it was not his intention that it should be called *Scytodes laeta* or to deny its existence. He regarded it as a species yet to be rediscovered and then properly placed, even perhaps in the genus *Loxosceles*. He found it strange that Nicolet did not, in the case of *laeta*, indicate that the species came from Chile or from some specific locality in that republic as was done

for most of the included species. The implication that *laeta*, and numerous other species for which Nicolet failed to mention definite locality information, may have come from some other area than Chile contributes nothing to the discussion.

On the basis of the above discussion, it is inescapable that we regard *Loxosceles laeta* (Nicolet) as a valid member of the genus from Chile. Remaining is the question of the proper placement of *laeta* within the genus. Simon (1907) was the first student to appraise the three names of Nicolet, and it is likely that he came to his conclusions with the actual material before him. His decision that all three names should be assigned to a single species, *laeta*, was arrived at with the same restraint and honesty that characterize all the work of this great arachnologist.

The only discordant feature in the Nicolet description of *laeta* is the leg measurements ("8-7½-7-9 lin.") which give the formula 4123. This is at variance with the typical formula for the species in that the second leg is usually longer than the first, 4213. However, we should have no illusions about the absolute nature of these measurements, which are variable within the species, as is shown in the description below in the Systematic Section. Occasional females have the first and second legs nearly equal in length, and some males have the second leg longer than the fourth, 2413. In some females the second tibiae equal or exceed the fourth tibiae in length, whereas in most the reverse is true. It is far easier to believe that Nicolet either made an error while measuring his specimen or had an atypical example before him. It must be remembered that *laeta* is the only species of this special series so far known from Chile. Simon's conclusion that Nicolet's *rufipes*, *laeta*, and *nigella* represent a single species has not been refuted by any data advanced by Bücherl.

The second proposal by Bücherl (1960), that the name *Loxosceles rufipes* (Lucas) must be substituted for the venomous species known as *laeta* for about 50 years, cannot be accepted. As shown above in the Historical Review, the name *rufipes* has been used for three different South American species, and for at least four additional ones in North America. *Loxosceles rufipes* (Lucas) was based

on a female from Guatemala, and the original specimen is presumed to be lost. The legs were described as being red, and the size was given as an inch (*une pouce*). The leg formula was given only by inference as 4123 but could also have been 1423. There is no species of the genus with either of these formulas. The formula 4123 happens to be the same as that given for *laeta* by Nicolet. In both cases there is good reason to assume that the author was in error. It is probable that Lucas' description was based largely on the color plate prepared by an artist.

As it is clear that *rufipes* cannot be identified on the basis of data furnished by the author, the name must either be regarded as a *nomen oblitum* or be assigned arbitrarily to a species from the area of origin. The latter action was taken by F. Pickard-Cambridge when he assigned the name to a species from Guatemala represented by material in the British Museum (Natural History). I hold that it was his right as first reviser to fix the name to the logical species. It is only incidental that *Loxosceles yucatana* Chamberlin and Ivie and *L. laeta* (Nicolet) are now known to occur in Guatemala. There is good reason to believe that *laeta* has only recently been introduced into Guatemala and was not present there when Lucas described his *rufipes*.

DISCUSSION OF *Loxosceles rufescens* (DUFOUR)

Loxosceles rufescens has often been called "cosmopolitan" or "ubiquitous," but its distribution pattern is not quite so simple as these adjectives imply. The specimens on which the specific name was based came from near Sagunto, Valencia Province, in Spain, and they have been lost. The original home of *rufescens* was probably the Mediterranean region of North Africa and Europe, where the species is very common and where also are found other related species. Its present distribution is a result of qualities that have made it readily transferable from one region to another by vehicles of man and allowed it to prosper. One of these qualities is domesticity. *Loxosceles rufescens* lives in and around houses and buildings and is most abundant in areas littered by man. It is presumably transported to new, distant colonizing areas by ships and planes. Whether it can become

established depends on factors related to the climates and native faunas of the invaded areas.

Bonnet [1957 (1945–1957, vol. 2, pt. 3)] gave the distribution of *rufescens* as recorded in the spider literature up to 1940, essentially as follows: in Europe from Spain and southern France east to the Balkans, Greece, and southern Russia; all the North African countries from Morocco to Egypt; Madagascar; the Near East; the Orient from Burma and India to China and Japan and the major East Indian islands; many islands of the North Atlantic Ocean, including the Azores, Canary Islands, Cape Verde Islands, and Bermuda; the eastern United States and Mexico in North America. Notably lacking are records from South Africa, Australia, New Zealand, Central America, and South America, but there may be records from some of these areas in the scattered literature since 1940. Millot (1940), in a work considering the Sicariidae and Pholcidae of (the then) French West Africa, did not record *rufescens*; he did, however, describe three related species from that area. It is clear that *rufescens* is not found in many areas presumably available to it by commerce, chiefly coastal areas, even though they might seem ideal for the establishment of stable populations.

In the United States *Loxosceles rufescens* has a very sporadic distribution and seems to be limited to domestic situations. It was found by me in the American Museum building in New York City a number of years ago and probably arrived hidden in packing material. Several examples were found in the basement of a local grocery store in 1965 and were brought to me for positive identification. In the New York area the species is presumed to be very rare. It is much more common in the southeastern states and probably is established there. Several examples have been sent to me for identification by Dr. D. W. Mick, who found them in buildings near Houston, Texas.

It is now certain that there has been no authentic record of *Loxosceles rufescens* from Mexico, Central America, or South America, even though the species may have been introduced repeatedly into these areas by trade. Chamberlin's 1916 record of *rufescens* from Huadquinia, Peru, and its disappear-

ance from the literature as the new species *accepta* Chamberlin (1920), were noted by Bücherl (1961, 1964a), who supposed that the former, older name was being replaced by a number of new species in the South American fauna. It also seemed curious to Bücherl that, in spite of centuries of uninterrupted trade among Spain, Portugal, and the South American countries, it had not occurred to spider specialists of South America that *rufescens* was, and had been for a long time, part of their fauna. He concluded that the common species called *rufipes* (and also *surata*) on numerous occasions by Mello-Leitão (1918, 1934) was in reality the cosmopolitan *Loxosceles rufescens* (Dufour). This identification cannot be seriously entertained, inasmuch as the Brazilian species is strikingly distinct by numerous features of both sexes from the true *rufescens*. This attempt further marks the systematic outlook of Bücherl as being distinct from that of other spider students and suggests that little credence can be given to his identifications in the genus.

Loxosceles rufescens (Dufour) is an easily

identified species on the basis of morphological features of the adults as now used by modern students. The former misuse of the name by previous students merely reflects our little understanding of this and other species of the genus until recent years. The name *rufescens* has often been casually and quite incorrectly used in North America and South America by the following workers for the species listed: by Comstock ("1912" [1913]), for *Loxosceles reclusa* Gertsch and Mulaik; by Chamberlin (1916), for *Loxosceles accepta* Chamberlin; by Chamberlin (1924), for *Loxosceles unicolor* Keyserling; by Petrunkevitch (1929), for *Loxosceles caribbaea* Gertsch; by Chickering (1932), for *Loxosceles panama* Gertsch; by Bryant (1940), for *Loxosceles cubana* Gertsch; by Bücherl (1961), for *Loxosceles gaucho*, new species; and by Bücherl (1961), for *Loxosceles similis* Moenkhaus.

In order to give the South American student a fuller understanding of *rufescens*, a description of the species is presented below in the Systematic Section.

SYSTEMATIC SECTION

FAMILY SCYTODIDAE

SUBFAMILY LOXOSCELINAE

Loxoscelinae SIMON, 1893b, p. 271. GERTSCH, 1958, p. 3.

Loxoscelidae GERTSCH, 1949, pp. 234, 266.

Ecribellate spiders of suborder Araneomorphae. Respiratory system consisting of pair of book lungs opening at base of abdomen and tracheal tubes opening externally through single transverse orifice just in front of spinnerets. Colulus conspicuous, apically pointed finger half as long as inferior spinnerets, clothed with setae. Spinnerets of medium size, six in number, set close together; inferior and superior pairs long, bisegmented, with conical apical segment; median pair small, one-segmented. Chelicerae without boss, tied together on inner side for about half of their length with white membrane; inner margin with transparent or whitish membrane apically thickened and darkened in tooth form. Outer side of chelicera with stridulating file of coarse grooves. Femur of pedipalp with single, short, black, stridulating pin near base on prolateral side. Labium longer than broad, relatively flexible and free; membranous suture joining it to sternum distinct; maxillae long, convergent in front around labium. Eyes six, in three diads; anterior median eyes lost; anterior lateral and posterior median eyes forming strongly recurved row. Tarsal claws two, set with single series of long teeth more numerous on front legs; several serrated bristles present on each tarsus which bears small onychium. Female pedipalp without claw. Legs and body clothed with fine subprocumbent hairs and rows of heavier setae of which some on legs are relatively robust. Female copulatory organ of haplogyne type: seminal receptacles opening directly into vagina. Male palpus: simple bulb, without hematodocha, bearing embolus as a thin spine and lacking conductor; accompanied by a carinate lamina in *spadicea* group.

TYPE OF SUBFAMILY: The genus *Loxosceles* Heineken and Lowe.

Some of the features of the genus *Loxosceles* were considered important enough by

Gertsch in 1949 to set it apart as a separate family. In the present paper the genus is restricted to subfamily rank in a modified family Scytodidae which comprehends only the genera *Scytodes*, *Drymusa*, and *Loxosceles*. Already excluded from the heterogeneous family Sicariidae of Simon are such discordant elements as *Plectreurys* and *Diguetia*, which have been raised to full family status.

The sedentary weavers of the genus *Loxosceles* are primitive spiders belonging to the section Haplogynae of the true spiders, or Araneomorphae. The typical number of eyes is six, and these are grouped in three diads forming a strongly recurved row. The missing pair of anterior median eyes is presumed to have been lost early in the racial history of the series, and the posterior median eyes have migrated to a forward position well in front of the lateral eyes.

The haplogyne spiders possess many generalized features, but they are characterized especially by their simple genitalia. In *Loxosceles* the tarsus of the palpus is little modified and forms only a shallow cup to accommodate in ventral attachment the basal portion of the bulb. The bulb is of simple, globose form and is abruptly produced into a thin, curved embolus. The genital orifice of the female is a transverse fissure without conspicuous modifications. In mature females the lips of this groove may be more darkly colored, more thickly sclerotized, and set with somewhat heavier setae than those of immature examples. There are no external foveae or positioning ridges in front or behind the genital groove as are found in *Scytodes* and *Drymusa*. The secondary female genital organ (epigynum) is of ectodermal origin and is developed just inside and in front of the orifice. It consists of a shallow, transverse atrium giving rise to a pair of simple, blind pouches (seminal receptacles), which are embedded in tissue between the voluminous book lungs. The characteristic appearance is shown in plate 6, figure 4. The two seminal receptacles and their complements, the two male palpi, have developed together to form a closely integrated organ. Only two receptacles are present, but they are subject to con-

siderable variation in some species, with development of adventitious lobes and fingers. The channels leading to these receptacles allow passage of the male embolus and sperm to the depositories, and then these same tubes later serve as fertilization canals to return the sperm to the vagina at the time of oviposition.

During mating the two palpi of the male are applied simultaneously to the genital orifices of the female, as was shown by Gerhardt (1928) for *Loxosceles rufescens*. It follows, then, that the right embolus of the male palpus enters the left receptacle, and the left embolus the right receptacle, of the female genital organ. This pattern seems to be the typical one of insertion for mygalomorph and haplogyne true spiders; but in all the former, and some of the latter, the palpi are inserted one at a time. In all the higher true spiders (Entelegynae) the right embolus is inserted into the right receptacle of the female, and vice versa. This new pattern has been verified by me for numerous families, but the mechanism of the change and the reasons for it are not clear.

The term "epigynum" is used in this paper as an exact synonym of "female genital organ," inasmuch as these terms are applied only to different aspects of the same structure (Gertsch, 1958, p. 4). Many arachnologists use epigynum for only the external aspect of the genital organ. It refers to the external openings of the internal genital organ and the pattern of rims, grooves, guides, scapes, and other positioning foci for parts of the male palpus. This means that no mygalomorph or haplogyne spider can have a structure called "epigynum," since the basic elements are all internal. Such usage becomes very inexact when some groups are considered. The foveae of *Scytodes*, lying behind the genital groove, the lobes and foveae of some species of *Plectreurys*, the external openings lying above the pedicel in members of the family Ochyroceratidae, and the complicated structures found in the Pholcidae are all accessory features of haplogyne spiders, and these cannot be called "epigyna," although they often are. In the entelegyne spiders the word "epigynum" becomes obscure or inexact in some families. The complicated positioning foci of the Mimetidae and the Nesticidae are not

developed around the external openings, which are posterior in position. In *Gaucelmus* no foci are to be found, and the external orifices are hidden under the posterior lip of the genital groove. The same is essentially true of *Nephila* and other entelegynes that show small development of what could be called an "epigynum." I see little reason to distinguish between the internal epigynum (female genital organ) of *Loxosceles*, in which the orifices are hidden beneath the lip of the genital groove, and the external epigynum of entelegyne spiders, in which the orifice has migrated to a surface position, thus giving rise to separate tubes.

The nomenclature and measurement standards in this paper are the conventional ones widely used in araneology. All measurements are in millimeters. The body measurements have been made with a stereoscopic microscope, with magnification of 10 times and read only to tenths of a millimeter. The leg length is the sum of the dorsal measurements of the various segments. The leg formula represents the numbered legs arranged in a descending series. The formula 4213 indicates that the fourth leg is longest, the second leg next, and so forth, and the presence of a bar above, 4̄213, signifies length equality of the two legs. The leg formulas are used extensively to separate species of the various groups and seem to be quite stable characters. At the same time it must be recognized that there are modest to wide variations in these features within a single species and that measurements of these long-legged spiders under alcohol are subject to some error.

GENUS *LOXOSCELES* HEINECKEN AND LOWE

Loxosceles HEINECKEN AND LOWE, in LOWE, 1835, p. 321. SIMON, 1893b, p. 272. ROEWER, 1954 (1942-1954, vol. 2), p. 319 (*Loxoscelis*). BONNET, 1957 (1945-1957, vol. 2, pt. 3), p. 2572. GERTSCH, 1958, p. 5.

Omosites WALCKENAER, 1833, p. 438.

Characters of genus as given for subfamily. Structure of typical species as shown in plate 3, figures 1-3, 10, 11. Carapace moderately longer than broad, quite low; pars cephalica set off by shallow grooves; median groove deep, linear depression running back toward caudal margin. Clypeus wide, sloping forward convexly, equal to two or more diameters of

Four similar species in which the carapace is distinctively marked with dentated, blackish, side bands (pl. 3, figs. 1, 10), are referred to this group. The legs are of medium length in three species, but those of *similis* are greatly elongated. The metatarsi of the males are essentially straight and unmodified except for greater flexibility in those of *similis*. The leg formulas are variable, either 2413 or 2143, and may differ in sexes of the same species, but the second legs are invariably the longest. The genitalia are distinctive in both sexes. The segments of the male palpi are relatively short, and some of the terminal ones, especially the tibiae, are strongly incrassated. The tarsus is nearly as long as the tibia. The epigyna are similar in design and present as their most distinctive feature a transverse, sclerotized plate which firmly holds the seminal receptacles. The plate is thicker and more

strongly sclerotized at the apex and bears a quite transparent central window consisting of thin integument. The openings to the receptacles can be seen on the dorsal surface as oval slits which lead to the thick-walled seminal receptacles lying on the ventral surface of the plate.

KEY TO THE SPECIES OF THE *gaucho* GROUP

1. Males 2
Females 4
2. First femur 2.1 times, first leg nine times, as long as carapace. *similis* Moenkhaus
First femur at most 1.7 times, first leg at most seven times, as long as carapace 3
3. Femur and tibia of palpus proportionately thicker (pl. 4, fig. 1); Brazil
. *gaucho*, new species
Femur and tibia of palpus thinner (pl. 4, fig. 6); Paraguay *variegata* Simon
4. Tarsus of female palpus incrassated
. *adelatida*, new species
Tarsus evenly tapered 5
5. Seminal receptacles small, oval pouches (pl. 3, fig. 9); leg formula, 2143
. *variegata* Simon
Seminal receptacles much larger; leg formula, 2413 6
6. Seminal receptacle rather short, curved (pl. 3, fig. 5); first femur 1.3 times as long as carapace *gaucho*, new species
Seminal receptacle much longer (pl. 3, fig. 6); first femur 1.8 times as long as carapace *similis* Moenkhaus

Loxosceles gaucho, new species

Plate 3, figures 1–5, 10, 11; plate 4, figures 1, 2; text figure 1

Loxosceles rufipes: MELLO-LEITÃO, 1918, p. 128; 1933, p. 22; 1934, pp. 72–73, figs. 1b, 2b, 3b; 1943, p. 154; 1944b, p. 312. BÜCHERL, 1952, pp. 133, 146–148.

Loxosceles rufescens: BÜCHERL, 1961, pp. 217–219, fig. 2a (part); 1964b, p. 41, figs. 1a–d, 4a–c.

DISCUSSION: This important and seemingly abundant species of eastern South America has been studied intensively by Bücherl (1952, 1961). Its venom is similar to that of the notorious *laeta*. It is often domestic and lives in and around houses as well as in caves and natural habitats that meet its ecological demands. This is the species that was consistently identified from 1918 to 1944 as *Loxosceles rufipes* by Mello-Leitão, who pre-

sented an acceptable verbal description as early as 1918 and good illustrations in 1934. Because of the unavailability of the name *rufipes* for this (or for that matter, for any of the South American species to which it has been applied), I have named it *gaucho*, in reference to the people of south Brazil where it is most common.

Mello-Leitão tentatively placed Holmberg's *Omosites bicolor* as a synonym of the presumed *rufipes* in 1943, and then in 1944 relegated it to the synonymy of *Loxosceles laeta*. I am content to support this later identification. The identity of *bicolor* has been uncertain in spite of the fact that the description and figure are adequate for diagnosis when considered along with geographic and ecological notes as supporting evidence. Holmberg (1876) illustrated a typical female in natural size and gave a size range of 13 to 14 mm. He found the species in abundance in houses where it spun its web retreat in dark places, in and under furniture and in clothing, but most often in angles formed by shelves in closets. The habitus of *bicolor* and its preferred habitat mark it as being the same as *laeta*. Such identity is further supported by the fact that *laeta* is common in the Buenos Aires region and, on the other hand, *Loxosceles gaucho*, new species (the *rufipes* of Mello-Leitão), seems not to be present there.

DIAGNOSIS: This medium to large species is readily separated from other species of its group by details of the genitalia and comparative leg measurements.

COLORATION: Living specimens are grayish or tawny. Coloration and pattern of preserved specimens of both sexes as follows:

Dorsal view of carapace of female as shown in plate 3, figure 1.

Integument of carapace variable, pale yellowish to dark orange or reddish brown, lightest in immature or subadult specimens, and marked with dusky to bold blackish pattern as illustrated. Pars cephalica quite uniform dusky reddish brown, forming behind a wide V- or U-shaped figure, with faint to quite distinct longitudinal lines (lightly impressed and granulated as seen in higher power) as follows: median pair running from median eyes to median groove; irregular lateral stripe on each side margining pars

FIG. 1. Distribution of species of *Loxosceles*.

cephalica; pair of short bars lying behind side eyes, of which inner one is very faint. Median pale stripe on carapace yellowish to orange, in many cases deeply dentate on sides to invade dusky side bands. Median groove and adjacent integument dusky. Eye tubercles black, thus narrowly ringed pale eyes. Carapace clothed with thick covering of fine, procumbent, black hairs, reduced in number or missing on pale areas, and with many suberect, curved bristles, mostly on pars cephalica, which arise from quite conspicuous round alveoli; side margin of carapace with fringe of these bristles. Sternum yellowish to orange, with thin covering of subprocumbent, dark hairs and thick series of long, erect, black bristles over entire surface; labium, maxillae, and coxae similarly clothed but bristles shorter. Labium and maxillae tinged with reddish brown. Hairs and bristles of preserved specimens in many cases rubbed off to leave integument bare, in which case conspicuous alveoli of bristles having granulated appearance.

Legs bright yellow to orange-brown, clear or lightly shaded with dusky, quite thickly clothed with fine, procumbent, dark hairs and set with numerous suberect, fine, black bristles and weak spinules. Fine spinules on legs lying in long rows, those on tibiae and metatarsi regular in size and closely set to form long combs. All hairs on appendages simple, but those on ventral surfaces of tarsi and metatarsi paler, seemingly softer and forming thin brushes of variable distinctness. Tibia and tarsus of female palpus bright reddish brown. Chelicerae dusky reddish brown, thinly set with fine black hairs and with curved black bristles, smooth to lightly granulated.

Abdomen gray to blackish; dorsum darkest, covered thickly and evenly with dusky, procumbent hairs and set evenly with short, suberect, dusky setae arising from quite conspicuous round alveoli; venter typically paler and more thinly clothed. Spinnerets dusky yellow.

STRUCTURE: Size of adult females, 7 mm. to 13 mm.; average, about 9 mm. in total body length. Size of adult males, 6 mm. to 11 mm.; average, about 8 mm.

Structural details of female as shown in plate 3, figures 1-5, 11. Carapace somewhat

longer than broad, truncated behind, widely rounded on sides, narrowed in front where pars cephalica at second eye row is slightly less than half of greatest width of carapace. Carapace quite evenly convex, only about one-fourth as high as greatest width, evenly declining to side margins. Median groove a deep linear depression occupying caudal third of carapace. Cephalic sutures faintly but distinctly apparent as lightly impressed lateral bands. Clypeus essentially straight in front, declining from median eyes which are set back slightly more than two full diameters from the margin.

Eye group of female occupying about five-sixths of width of head at that point. Eyes (pl. 3, fig. 1) subequal in size, in three diads rather close together; median eyes separated from anterior lateral by long diameter; a line along front edges of anterior lateral eyes touching caudal edges of median eyes; in dorsal view posterior lateral eye lying full diameter from lateral edge of pars cephalica.

Carapace of male (pl. 3, fig. 10) somewhat broader and less produced in front, with pars cephalica proportionately shorter. Clypeus narrower in front of eyes, its width not fully two diameters of median eyes. Eyes closer together; anterior lateral eye separated from median by narrow diameter of latter; a line along front edges of anterior lateral eyes cutting through caudal fourth of median eyes. As viewed from above posterior lateral eye lying two full diameters from edge of pars cephalica.

Sternum and under side of carapace as shown in plate 3, figure 3. Sternum about two-thirds as broad as long, produced behind to rounded point between posterior coxae, which are separated by less than width. Labium longer than basal width (11/9), narrowed and rounded apically. Maxillae about three times as long as basal width, convergent apically to enclose labium. Chelicerae (pl. 3, fig. 11) joined together on midline at base with a white, somewhat flexible membrane which allows lateral movement. Inner margin of chelicera with whitish lamina which is produced at apex into large blackish tooth and rounded whitish lobe lying in fang groove and projecting over fang, which is short, curved, and thick at base.

Abdomen elongate-oval in dorsal view,

about as high as wide. Position of lungs and spiracular opening as shown in plate 3, figure 2. Colulus a thin finger nearly half as long as basal segment of front spinneret.

FEMALE FROM SÃO PAULO, BRAZIL: Carapace 4.7 mm. long, 3.9 mm. wide.

	I	II	III	IV	Palp
Femur	6.4	6.9	6.0	6.6	1.5
Patella	1.5	1.6	1.5	1.5	0.6
Tibia	6.4	6.7	4.9	6.0	1.0
Metatarsus	6.3	7.0	5.8	6.8	—
Tarsus	1.6	1.5	1.3	1.4	1.7
Total	22.2	23.7	19.5	22.3	4.8

Leg formula, 2413; first and fourth legs subequal. First leg 4.7 times as long, first femur 1.3 times as long, as carapace.

Epigynum as illustrated in plate 3, figures 4, 5. Transverse plate strongly sclerotized and presenting inconspicuous, lateral, slitlike, atribursal orifices. Seminal receptacles short, curved, slightly thickened at apex.

MALE FROM SÃO PAULO, BRAZIL: Carapace 3.7 mm. long, 3.3 mm. wide.

	I	II	III	IV	Palp
Femur	6.3	7.3	5.8	6.7	1.8
Patella	1.3	1.3	1.3	1.3	0.4
Tibia	7.1	8.5	5.3	6.3	0.9
Metatarsus	7.8	10.6	6.5	7.8	—
Tarsus	1.6	1.7	1.3	1.4	0.9
Total	24.1	29.4	20.2	23.5	4.0

Leg formula, 2143. Legs proportionately much longer than those of females. First leg seven times as long, first femur 1.7 times as long, as carapace.

Male palpus (pl. 4, figs. 1, 2) short, with most segments thickened. Femur cylindrical, four times as long as broad above. Patella short, subglobular, about as broad as long. Tibia short, thickened, three-fourths as wide as long. Tarsus elongate-oval, flattened below, broadly rounded at apex. Bulb of medium size, half as broad as tarsal length. Embolus thick at base, forming sinuous curve, about twice as long as bulbular portion.

TYPE DATA: Male holotype from São Paulo, Brazil, July 17, 1962 (A. F. Archer).

DISTRIBUTION: Southern Brazil.

RECORDS: Brazil: Rio Grande do Sul

(Mello-Leitão, 1918); São Paulo (Mello-Leitão, 1918; Bücherl, 1961).

Loxosceles similis Moenkhaus

Plate 3, figures 6, 7; plate 4, figures 3, 4; text figure 1

Loxosceles similis MOENKHAUS, 1898, p. 79. CAMARGO-ANDRADE, 1937, p. 690. CAMARGO, 1953, p. 303.

Loxosceles surata SIMON, 1907, p. 247. PETRUNKEVITCH, 1911, p. 118. MELLO-LEITÃO, 1918, pp. 127, 129; 1934, p. 69; 1944a, p. 2. CHAMBERLIN, 1920, p. 40 (*serrata*). ROEWER, 1942 (1942-1954, vol. 1), p. 321 (*Loxoscelis*). BONNET, 1957 (1945-1957, vol. 2, pt. 3), p. 2578.

DISCUSSION: This distinct species was described in excellent fashion by Moenkhaus in 1898 on the basis of a single male from the state of São Paulo in Brazil. His description, measurements, and good illustration of the male palpus leave no doubt as to its proper identity. However, in 1907, Simon tentatively placed *similis* as a synonym of *laeta*, whereas in the same paper he briefly described a species from Minas Gerais, Brazil, under the name of *surata*. Simon's placement of *similis* was followed by most authors until 1953 when Camargo, after a study of the type, reinstated the species to its proper station and placed *surata* as a synonym. *Loxosceles similis* has the same habits as *gaucho* and *variegata* and lives in houses and buildings, mines, caves, and in other suitable situations. Its presence in the state of São Paulo suggests that its distribution pattern is sympatric, at least in part, with that of *gaucho*.

DIAGNOSIS: The much longer legs of both sexes readily separate *similis* from *variegata* and *gaucho*. It is most closely related to the former, from which it is also separable by good genitalic differences, as shown in the figures.

Coloration, structure, and size in both sexes like those of *gaucho*.

FEMALE FROM OURO PRETO, MINAS GERAIS, BRAZIL: Carapace 4.6 mm. long, 4 mm. wide.

	I	II	III	IV	Palp
Femur	8.2	9.0	7.5	8.4	1.7
Patella	1.6	1.6	1.6	1.6	0.6
Tibia	8.7	9.8	6.5	8.3	1.1
Metatarsus	8.7	10.3	8.0	9.5	—
Tarsus	1.7	1.8	1.4	1.6	1.5
Total	28.9	32.5	25.0	29.4	4.9

Leg formula, 2413. First leg 6.2 times as long, first femur 1.8 times as long, as carapace.

Epigynum (pl. 3, figs. 6, 7) presenting a strongly sclerotized plate, on ventral surface of which are seen two large, oval, atriobursal orifices which lead to long, thick, apically enlarged sperm receptacles.

MALE FROM VICOSA, MINAS GERAIS, BRAZIL: Carapace 3.6 mm. long, 3.3 mm. wide.

	I	II	III	IV	Palp
Femur	8.7	10.5	8.2	9.4	2.0
Patella	1.4	1.4	1.4	1.4	0.6
Tibia	10.0	12.2	7.8	10.0	0.9
Metatarsus	11.0	14.4	10.2	11.8	—
Tarsus	2.0	2.2	1.7	1.7	0.8
Total	33.1	40.7	29.3	34.3	4.3

Leg formula, 2413. First leg nine times as long, first femur 2.1 times as long, as carapace.

Male palpus (pl. 4, figs. 3, 4) most similar to that of *variegata*. Femur cylindrical, five times as long as broad above. Patella short, two-thirds as broad as long. Tibia short and thick, as deep as broad, about two-thirds as broad as dorsal length. Tarsus elongate-oval, flattened below, moderately convex above, slightly shorter than tibia. Bulb of median size, its width slightly more than half of tarsal length. Embolus a flattened spine quite broad at base, evenly curved, equal to about twice length of bulb.

TYPE DATA: Male type of *Loxosceles similis* Moenkhaus from Iguapé, São Paulo, in Departamento de Zoologia de Secretaria de Agricultura, São Paulo, Brazil. Cotypes of *Loxosceles surata* Simon from Minas Gerais, Brazil, in the Muséum National d' Histoire Naturelle, Paris, France.

DISTRIBUTION: States of Pará, São Paulo, and Minas Gerais, Brazil.

RECORDS: *Brazil*: Pará: Aurá (Mello-Leitão, 1944a). São Paulo: Altinópolis, near Batataes, June 28, 1946 (Otto Schubart), males and females (Camargo, 1953); Iguapé, male type (Moenkhaus, 1898). Minas Gerais: (Simon, 1907); Ubá, September 21, 1943 (F. Pough), female; Viçosa, 1930 (Hambleton), four males; Ouro Preto, April, 1954 (N. L. H. Krauss), female; Minas de Serrinha, Diamantina, December, 1944, to March, 1945 (Mrs. Elizabeth Cohn), many males, females, and immature.

Loxosceles variegata Simon

Plate 3, figures 8, 9; plate 4, figures 5, 6; text figure 1

Loxosceles variegata SIMON, 1897b, pp. 2, 5; 1907, p. 247, fig. 1e. PETRUNKEVITCH, 1911, p. 119. MELLO-LEITÃO, 1946, p. 32. ROEWER, 1942 (1942-1954, vol. 1), p. 321 (*Loxoscelis*). BONNET, 1957, p. 2579. BÜCHERL, 1961, p. 219; 1964b, p. 47.

DISCUSSION: Simon based *variegata* on a single, possibly immature female specimen from Paraguay and gave an acceptable verbal description. Bücherl's statements (1961, p. 219; 1964b, p. 47) that the name is a *nomen nudum* were in error. Numerous males and females are now known from a few localities in Paraguay. These spiders live in houses and outbuildings and under tree trunks and bark on the ground, so it is clear that their habits are like those of the allied *similis* and *gaucho*. *Loxosceles variegata* represents the *gaucho* group in Paraguay and, in terms of our present knowledge, is allopatric in distribution pattern.

DIAGNOSIS: This species is most closely related to *Loxosceles similis* Moenkhaus, but it is readily differentiated by the much shorter legs and by distinctive differences in the genitalia of both sexes.

Coloration, structure, and size of both sexes like those of *gaucho*.

FEMALE FROM ASUNCIÓN, PARAGUAY: Carapace 4.6 mm. long, 4 mm. wide.

	I	II	III	IV	Palp
Femur	6.5	6.8	5.8	6.2	1.5
Patella	1.5	1.5	1.5	1.5	0.5
Tibia	6.1	6.7	4.9	6.0	1.0
Metatarsus	6.6	7.5	6.0	6.7	—
Tarsus	1.5	1.5	1.3	1.4	1.6
Total	22.2	24.0	19.5	21.8	4.6

Leg formula, 2143. First leg 4.8 times as long, first femur 1.4 times as long, as carapace.

Epigynum (pl. 3, figs. 8, 9) similar to that of *similis* and that of *gaucho* in presenting a strongly sclerotized, transverse plate, on dorsal surface of which lie oval atriobursal orifices, which lead into small, oval seminal receptacles.

MALE FROM ASUNCIÓN, PARAGUAY: Carapace 4 mm. long, 3.5 mm. wide.

	I	II	III	IV	Palp
Femur	7.5	8.5	6.5	7.5	1.6
Patella	1.5	1.5	1.5	1.5	0.5
Tibia	8.7	10.7	6.3	7.6	0.8
Metatarsus	9.2	12.0	7.5	8.7	—
Tarsus	2.0	2.0	1.4	1.6	0.8
Total	28.9	34.7	23.2	26.9	3.7

Leg formula, 2143. First leg seven times as long, first femur 1.7 times as long, as carapace.

Male palpus (pl. 4, figs. 5, 6) most closely resembling that of *similis*, with apical segments greatly thickened. Femur cylindrical, five times as long as broad above. Patella short, four-fifths as broad as long. Tibia short, thickened, as deep as high and about three-fifths as wide above as greatest length. Tarsus elongate-oval, flattened below, higher and more convex above than that of *similis*. Bulb of medium size, somewhat more than half of tarsal length. Embolus a flattened spine quite broad at base, evenly curved, equal to twice height of bulb.

TYPE DATA: Female type from Paraguay in the Muséum National d'Histoire Naturelle (Simon collection) in Paris.

DISTRIBUTION: Paraguay.

RECORDS: *Paraguay*: Sapucay (W. Foster), males and females [British Museum (Natural History)]. Asunción (Bohls collection), males and females [British Museum (Natural History)]. Asunción, August 9, September 2, 23, 1902 (J. D. Anitsits), females (Zoologisches Museum, Humboldt-Universität zu Berlin). Villa Sana, January 19, 1903 (J. D. Anitsits), females (Zoologisches Museum, Humboldt-Universität zu Berlin).

***Loxosceles adelaida*, new species**

Plate 4, figure 11

DIAGNOSIS: This species, the only member of the *gaucho* group in which the tarsus of the female palpus is incrassated, most closely resembles *variegata* in structure. The legs are longer and thinner, as shown in the measurements, and the sclerotized plate of the epigynum differs in important details, as illustrated.

Coloration and structure like those of *variegata*. Carapace and appendages bright orange, evenly clothed with fine black hairs. Carapace with indistinct pattern of dusky

and pale spots as shown for *gaucho* (pl. 3, fig. 1). Abdomen gray, covered thinly with fine black hairs. Pars cephalica rather narrow, its frontal width only half of width of carapace. Clypeus of moderate length, in height equal to two full diameters of median eye. Eyes rather large, in moderately recurved row; line along front edges of anterior lateral eye touching posterior edges of lateral eye; median eye separated from anterior lateral eye by a little less than full diameter of former. Tarsus of female palpus longer than tibia, enlarged at middle to width of tibia, tapered to thin point. Legs long, thin; first femur 9.5 times as long as width.

FEMALE FROM GRAJAÚ, BRAZIL: Total length, 8.5 mm. Carapace 3.3 mm. long, 2.7 mm. wide.

	I	II	III	IV	Palp
Femur	5.3	5.7	4.9	5.7	1.4
Patella	1.2	1.2	1.2	1.2	0.4
Tibia	5.5	6.0	4.2	5.3	1.0
Metatarsus	5.5	6.2	4.7	6.3	—
Tarsus	1.2	1.4	1.2	1.3	1.3
Total	18.7	20.5	16.2	19.8	4.1

Leg formula, 2413. First leg 5.66 times as long, first femur 1.6 times as long, as carapace.

Epigynum (pl. 4, fig. 11) similar to that of *variegata* but differing in numerous details, as shown in illustration. Position of atriobursal orifice uncertain, presumably at corner of sclerotized plate and leading into indistinct, transverse tube.

TYPE LOCALITY: Female holotype from Grajaú, Guanabara, Brazil, November 2, 1963 (H. S. Lopes, P. Wygodzinsky).

THE *spadicea* GROUP

This small group of quite hairy species is based on distinctive features of the genitalia. The carapace bears no dark pattern on the sides. The male palpus has a spherical bulb and a thin, short embolus. A distinct wing or carina accompanies the embolus and in some species encircles the apical half of the bulb. The palpus is rather small and thin for the size of the spiders, and the various segments are differently expressed according to the species—long in *intermedia*, medium in *spa-*

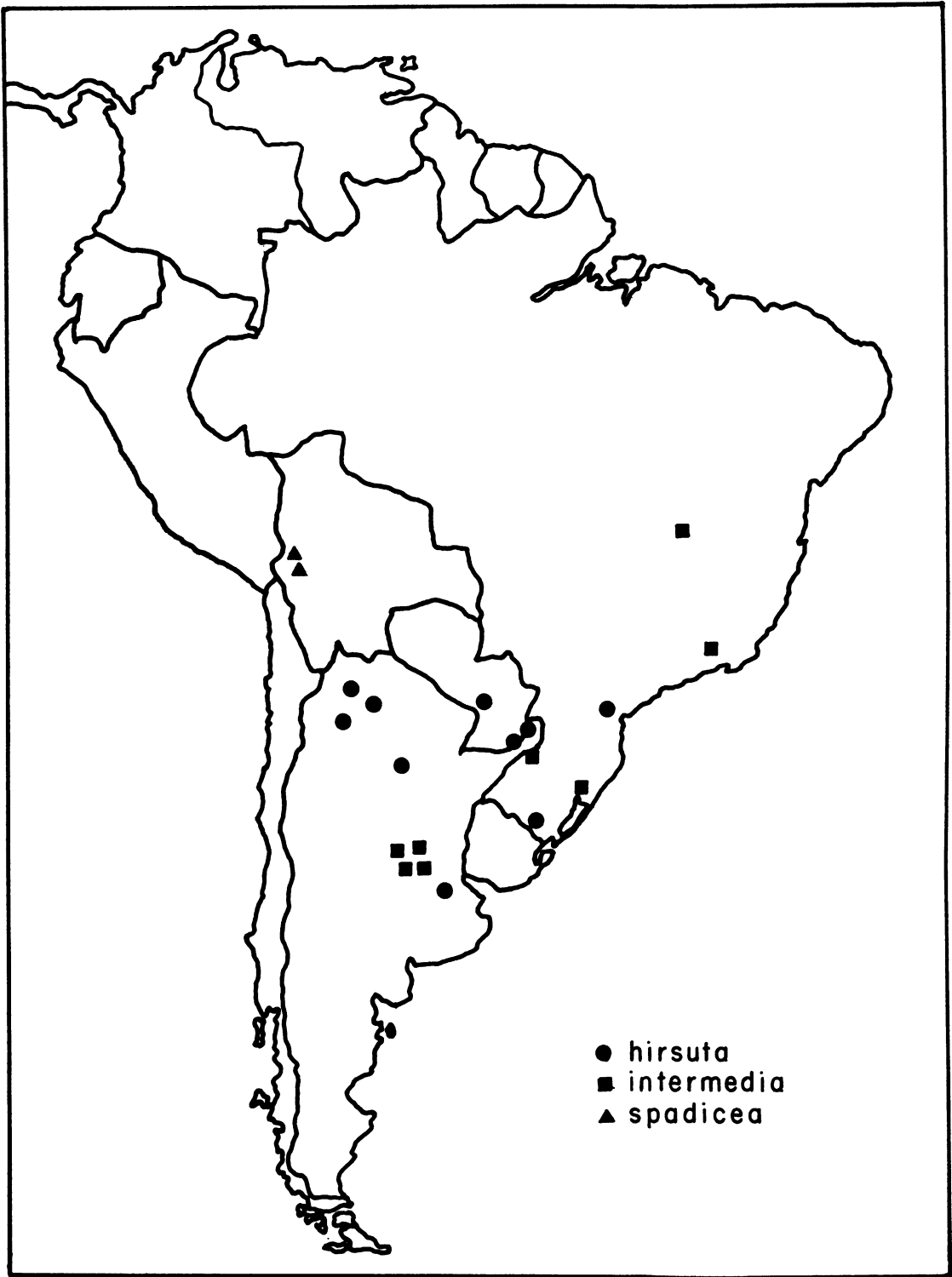


FIG. 2. Distribution of species of *Loxosceles*.

dicea, and quite short in *hirsuta*. The metatarsi of the males are essentially straight. The leg formulas are quite uniform, 2413 in males and 2143 in most females. The epigyna present small, tubular receptacles which are very widely separated by three to six times their width at the base. In *ornata* the receptacle is a simple tube, but in *spadicea* and *hirsuta* there is a small, blind bursa near the end of which the tubular receptacle originates.

Loxosceles spadicea Simon is known only from the high country of Bolivia and is replaced in Argentina and Brazil by the related *L. hirsuta* Mello-Leitão. A third species, *L. intermedia* Mello-Leitão, occurs in Argentina and Brazil.

KEY TO THE SPECIES OF THE *spadicea* GROUP

1. Males 2
Females 4
2. Embolus nearly as long as width of bulb and accompanying carina inconspicuous (pl. 5, fig. 1). *intermedia* Mello-Leitão
Embolus much shorter, accompanied by distinctive carina which encircles apex of bulb 3
3. Tibia of palpus not fully twice as long as broad (pl. 5, figs. 4, 5) . . . *hirsuta* Mello-Leitão
Tibia of palpus at least twice as long as broad *spadicea* Simon
4. Receptacle of epigynum lacking blind sac *intermedia* Mello-Leitão
Receptacle with blind sac 5
5. Receptacles separated by about four times basal width (pl. 5, figs. 12, 13)
Receptacles separated by about six times basal width (pl. 5, fig. 11). *spadicea* Simon

Loxosceles spadicea Simon

Plate 5, figures 8–11; text figure 2

Loxosceles spadicea SIMON, 1907, p. 247, fig. 10. PETRUNKEVITCH, 1911, p. 118. CHAMBERLIN, 1920, p. 40. ROEWER, 1942 (1942–1954, vol. 1), p. 321 (*Loxoscelis*). BONNET, 1957, p. 2578. BÜCHERL, 1961, p. 219.

DIAGNOSIS: This species is readily separated by genitalic features of both sexes, as shown in the illustrations.

Coloration essentially like that of other species of the genus. Carapace dull yellow to orange-brown, rather thickly covered with procumbent blackish hairs and set with rather weak, suberect, black setae. Pars cephalica of males U-shaped, reddish brown,

showing good contrast with yellowish pars thoracica. Terminal segments of long legs of male dark reddish brown. Other structural details essentially like those of other groups. Clypeus broad, equaling nearly three diameters in female, and two and one-half diameters in male. Eyes close together in both sexes and with medium recurvature; line along front edges of lateral eyes cutting slightly into median eyes; median eye separated from lateral by one diameter.

FEMALE FROM LA PAZ, BOLIVIA: Total length, 7 mm. Carapace 3 mm. long, 2.5 mm. wide.

	I	II	III	IV	Palp
Femur	3.2	3.6	3.0	3.5	1.0
Patella	0.8	0.8	0.8	0.8	0.3
Tibia	3.2	3.6	3.3	2.6	0.7
Metatarsus	3.3	3.7	2.8	3.6	—
Tarsus	1.4	1.4	1.0	1.2	1.1
Total	11.9	13.1	10.9	11.7	3.0

Leg formula, 2143. First leg 3.2 times as long, first femur 1.07 times as long, as carapace.

Epigynum (pl. 5, fig. 11) with tubular receptacles very widely separated by six or more times their basal width.

MALE FROM LA PAZ, BOLIVIA: Total length, 5.3 mm. Carapace 2.5 mm. long, 2.1 mm. wide.

	I	II	III	IV	Palp
Femur	3.2	3.7	3.0	3.6	1.3
Patella	0.8	0.8	0.8	0.8	0.5
Tibia	3.3	4.1	2.8	3.5	0.8
Metatarsus	3.3	4.2	3.1	4.1	—
Tarsus	1.2	1.3	1.0	1.2	0.4
Total	11.8	14.1	10.7	13.2	3.0

Leg formula, 2413. First leg 4.7 times as long, first tibia 1.3 times as long, as carapace. Metatarsi essentially straight.

Palpus (pl. 5, figs. 8–10) of distinctive design. Femur about seven times as long as width. Patella twice as long as broad. Tibia more than twice as long as broad (9/4), as deep as broad, truncated at apical end, evenly narrowed at base. Tarsus quite large, somewhat longer than broad. Bulb spherical and embolus short.

TYPE DATA: Male and female cotypes from Yungas and La Paz, Bolivia, in the Muséum National d'Histoire Naturelle, Paris, France.

DISTRIBUTION: Bolivia.

RECORDS: *Bolivia*: La Paz: La Paz, 3600 meters (Garlepp), male, two females (Muséum National d'Histoire Naturelle, Paris); 4000 meters, March–April, August–December, 1958–1959 (R. Walsh), five males, one immature female from houses. Yungas, 2000 meters (Simon, 1907).

***Loxosceles hirsuta* Mello-Leitão**

Plate 5, figures 3–5, 12, 13; text figure 2

Loxosceles hirsuta MELLO-LEITÃO, 1931, p. 13; 1934, p. 69, figs. 1e, 2c; 1943, p. 154; 1944b, p. 312; 1945, p. 214; 1947, p. 232. ROEWER, 1942 (1942–1954, vol. 1), p. 320 (*Loxoscelis*). BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2574. BÜCHERL, 1961, p. 219.

Loxosceles spadicea: MELLO-LEITÃO, 1941, p. 108, fig. 3.

DIAGNOSIS: This is a near relative of *Loxosceles spadicea* but can be readily recognized by genitalic features. The male palpus is smaller and has the segments proportionately shorter, as shown in the illustrations. Although the seminal receptacles of the epigynum are similar in design to those of *spadicea*, they are much closer together. The legs of the female seem to be slightly longer than those of *spadicea* and also present slight differences in the formula; it is possible that these characters are not completely trustworthy.

Coloration and structure essentially like those of *spadicea*.

FEMALE FROM MISIONES, ARGENTINA: Total length, 6.7 mm. Carapace 2.7 mm. long, 2.4 mm. wide.

	I	II	III	IV	Palp
Femur	2.8	3.2	2.3	3.3	0.7
Patella	0.8	0.8	0.8	0.8	0.3
Tibia	2.7	3.1	2.3	3.1	0.5
Metatarsus	2.7	3.2	2.6	3.3	—
Tarsus	1.2	1.2	0.8	1.0	0.8
Total	10.2	11.5	8.8	11.5	2.3

Leg formula, $\overline{2413}$; second and fourth legs equal. First leg 3.8 times as long, first femur 1.0 times as long, as carapace.

Epigynum (pl. 5, figs. 12, 13) with tubular receptacles separated by four or five times basal width.

MALE FROM MISIONES, ARGENTINA: Total length, 5 mm. Carapace 2.5 mm. long, 2 mm. wide.

	I	II	III	IV	Palp
Femur	3.5	4.8	3.6	4.0	1.2
Patella	0.8	0.8	0.8	0.8	0.5
Tibia	3.8	5.7	3.4	4.0	0.7
Metatarsus	3.8	5.9	3.8	4.5	—
Tarsus	1.3	1.8	0.9	1.1	0.4
Total	13.2	19.0	12.5	14.4	2.8

Leg formula, 2413. First leg 5.3 times as long, first femur 1.4 times as long, as carapace. All metatarsi essentially straight.

Male palpus (pl. 5, figs. 3–5) somewhat shorter than that of *spadicea*. Femur six times as long as broad. Patella about twice as long as broad, five-sevenths as long as tibia. Tibia about twice as long as broad above or on side. Tarsus suboval. Bulb spherical and embolus short. Relation of embolus and carina as shown in plate 5, figure 3.

TYPE DATA: Female type from Pedras Altas, Municipios de Cacimbinhas, Rio Grande do Sul, Brazil (Cezar Pinto), in the Museu Nacional, Rio de Janeiro.

DISTRIBUTION: Southern Brazil, Paraguay, and Argentina.

RECORDS: *Brazil*: Rio Grande do Sul: (Mello-Leitão, 1943). Paraná: Curitiba (Mello-Leitão, 1947). *Argentina*: Salta: Salta, February 14, 1951 (E. Ross, A. Michelbacher), male, female. Rosario de la Frontera (Mello-Leitão, 1942). Misiones: Eldorado, Puerto Victoria (Mello-Leitão, 1945). Puerto Bemberg, November, 1953 (R. Schiapelli, De Carlo), female; December, 1943 (M. J. Viana), male, female. Buenos Aires: (Mello-Leitão, 1944b). Tucumán: Tucumán, April 4, 1965 (H. Levi), male, in buildings. Córdoba: Córdoba, 1946 (De Carlo), female. Valle Hermoso, 800 meters, April 25, 1962 (G. de Ferrariis), two females. *Paraguay*: Asunción, September 15, 1956 (C. D. J. Brown), female.

***Loxosceles intermedia* Mello-Leitão**

Plate 5, figures 1, 2, 14; text figure 2

Loxosceles intermedia MELLO-LEITÃO, 1934, pp.

69, 72, figs. 1d-3d. ROEWER, 1942 (1942-1954, vol. 1), p. 320 (*Loxoscelis*). BONNET, 1957 (1945-1957, vol. 2, pt. 3), p. 2574.

Loxosceles ornata MELLO-LEITÃO, 1938, p. 91, fig. 2 (*ornatus*); 1941, p. 107, fig. 2. ROEWER, 1942 (1942-1954, vol. 1), p. 321 (*Loxoscelis*). BONNET, 1957 (1945-1957, vol. 2, pt. 3), p. 2575. BÜCHERL, 1961, p. 219.

Loxosceles spadicea: BÜCHERL, 1964b (Species C, in part), pp. 38 ff., figs. 3a-3d.

DIAGNOSIS: This very distinct species is larger than *spadicea*, and the male has proportionately longer legs, as shown in the measurements. The longer tibia of the male palpus and especially the distinctive embolus and carina of the bulb make identification easy. The female is readily identified by the details of the epigynum, the seminal receptacles of which are widely separated and lack an accessory branch at the base.

Coloration and structure essentially like those of *spadicea*.

FEMALE FROM PORTO ALEGRE, BRAZIL: Total length, 8.5 mm. Carapace 4 mm. long, 3.5 mm. wide.

	I	II	III	IV	Palp
Femur	4.2	4.5	3.9	4.2	1.3
Patella	1.2	1.2	1.2	1.2	0.5
Tibia	4.1	4.3	3.1	4.1	0.9
Metatarsus	4.4	4.8	3.9	4.8	—
Tarsus	1.2	1.2	1.0	1.2	1.1
Total	15.1	16.0	13.1	15.5	3.8

Leg formula, 2413. First leg four times as long, first femur 1.1 times as long, as carapace.

Epigynum (pl. 5, fig. 14) with two widely separated receptacles, each a simple coiled tube without accessory branch in basal part.

MALE FROM SANTA ROSA, BRAZIL: Total length, 8.5 mm. Carapace 4 mm. long, 3.5 mm. wide.

	I	II	III	IV	Palp
Femur	6.7	8.4	6.0	6.8	2.5
Patella	1.4	1.4	1.4	1.4	0.9
Tibia	7.0	9.5	5.3	6.5	1.3
Metatarsus	7.6	10.5	6.4	7.5	—
Tarsus	1.8	2.0	1.3	1.4	0.7
Total	24.5	31.8	20.4	23.6	5.4

Leg formula, 2143. First leg 6.1 times as long, first femur 1.67 times as long, as carapace. Metatarsi essentially straight.

Palpus (pl. 5, figs. 1, 2) quite small, with all segments rather thin. Femur eight times as long as broad. Patella two and one-half times as long as wide, more than half of length of tibia. Tibia three times as broad or as deep as long, gradually narrowed to base. Tarsus subovate. Bulb spherical, with small curved embolus bearing at base a narrow carina.

TYPE DATA: Of *Loxosceles intermedia*, male and female types from Petrópolis, Rio de Janeiro, Brazil (F. T. Borgmeier), in the Museu Nacional, Rio de Janeiro, Brazil; of *L. ornata*, female type from Cabana, Córdoba, Argentina (M. Birabén), in the Museo de La Plata, La Plata, Argentina.

DISTRIBUTION: Southern Brazil and adjacent Argentina.

RECORDS: *Brazil*: Federal District: Brasília, female. Rio de Janeiro: Petrópolis, April, 1946, 850 meters (H. Sick), female. Costa da Serra (Hensel), male, female. São Paulo: Ten miles south of São Paulo, February 22 and August 25, 1962 (G. Eiten), female and male, in laboratory of Instituto de Botânica. Rio Grande do Sul: Santa Rosa, May, 1955 (C. Biezanko), male, female. Porto Alegre, 1935, female. *Argentina*: Córdoba: Cabana; Potrero de Loza; Agua de Oro; La Falda (Mello-Leitão, 1941), males, females.

THE *amazonica* GROUP

This is a minor group and includes only a single representative, herein described as *Loxosceles amazonica*. The carapace is marked by dark side bands like those of the *gaucho* group. In the incrustation of some segments of the male palpus this species also resembles that group. The femur is short and thick, the tibia is considerably inflated, and the tarsus is of modest dimensions, being very much shorter than the tibia. The front metatarsi of the male are straight. In both sexes the leg formula is 2413. The epigynum features two thick-walled, subtriangular receptacles, each with a cluster of small lobes at the apex. These receptacles are essentially free and movable and not closely tied by the

transverse band of sclerotized integument passing across them. The openings into the receptacles are large transverse slits (pl. 5, fig. 7) easily seen when one lifts up the front lip of the genital opening.

Loxosceles amazonica is arbitrarily awarded group status on the basis of special characters setting it apart from the array of species of the *laeta* group. In some features it most closely resembles *rufescens* and *distincta* of the Palearctic fauna. The receptacle of the epigynum of each of these species bears only a single rounded lobe at the apex.

A description and illustrations of both sexes of *Loxosceles rufescens* are included in this paper for comparison with *amazonica* and the species of the *laeta* group.

***Loxosceles amazonica*, new species**

Plate 4, figures 7–10; plate 5, figures 6, 7; text figure 1

DIAGNOSIS: This very distinct species is easily separated from *gaucho* and relatives by pronounced differences in the genitalia of both sexes. The epigynum lacks a single sclerotized transverse plate and presents instead two free receptacles, each with an apical cluster of lobes. The segments of the male palpus are incrassated, but the tarsus is much shorter than the tibia.

Coloration and structure similar to those of *gaucho* except as follows: Eyes somewhat closer together and less recurved in both sexes. Median eyes of female separated from anterior lateral eye by narrow diameter, and line along front edges of lateral eyes cutting posterior third of median eyes. Clypeus broad, equal to somewhat more than two long diameters of median eye. In male, clypeus not fully twice length of median eye (42/25) and eyes even closer together; median eyes contiguous, elongate-oval, separated from subequal lateral eye by two-thirds of narrow diameter; front eye row less recurved, a line along front edges of lateral eyes cutting nearly through centers of median eyes.

FEMALE FROM SANTA ISABEL, MATO GROSSO, BRAZIL: Total length, 9.3 mm. Carapace 4.8 mm. long, 4.1 mm. wide. Abdomen 5 mm. long, 3.5 mm. wide.

	I	II	III	IV	Palp
Femur	5.7	6.0	5.3	5.8	1.4
Patella	1.6	1.6	1.6	1.6	0.5
Tibia	5.8	6.0	4.6	5.5	0.8
Metatarsus	5.8	6.5	5.3	6.4	—
Tarsus	1.3	1.4	1.2	1.3	1.4
Total	20.2	21.5	18.0	20.6	4.1

Leg formula, 2413. First leg 4.2 times as long, first femur 1.2 times as long, as carapace.

Epigynum (pl. 4, fig. 6) presenting two large, triangular receptacles marked by brown sclerotized bands, and each of these bearing at apex four or five small globular lobes.

MALE FROM GURUPA, AMAZONAS, BRAZIL: Total length, 8.6 mm. Carapace 4 mm. long, 3.5 mm. wide. Abdomen 5 mm. long, 3.2 mm. wide.

	I	II	III	IV	Palp
Femur	5.5	6.0	5.2	5.7	1.6
Patella	1.4	1.5	1.4	1.4	0.5
Tibia	5.7	6.5	4.7	5.4	0.9
Metatarsus	6.1	6.7	5.3	6.2	—
Tarsus	0.8	1.3	1.1	1.2	0.5
Total	19.5	22.0	17.7	19.9	3.5

Leg formula, 2413. First leg 4.8 times as long, first femur 1.3 times as long, as carapace.

Male palpus (pl. 4, figs. 7–10) very short, with all segments thickened. Femur cylindrical, about three and one-half times as long as dorsal width. Patella globose, nearly as broad as long. Tibia 0.7 mm. wide as seen from above, about as deep in lateral view, somewhat longer than wide. Tarsus oval, set asymmetrically, somewhat longer than wide. Bulb about same size as tarsus, oval in side view. Embolus tapered, apically curved, equal to about one and one-half times length of bulb.

TYPE DATA: Female holotype from Santa Isabel, Araguaia River, Mato Grosso, Brazil, July 15–25, 1957 (Borys Malkin).

DISTRIBUTION: Northern Brazil (see fig. 1).

RECORDS: *Brazil:* Amazonas: Gurupa, December to April, 1896 (Austen and Cambridge), three males, four females taken dur-

ing voyage of S. S. Faraday up Amazon River, in British Museum (Natural History). Cuyuba, two females. Pebas (Peru) to São Paulo de Olivença (Muth), three females. Mato Grosso: Santa Isabel, January 8, 1962 (B. Malkin), penultimate male. Barra do Tapirapé, November 11–30, 1960 (B. Malkin), immature. Maranhao: About 35 kilometers south of Loreto, May 10, 1962 (G. Eiten). Pernambuco: Pernambuco, four females, immature.

***Loxosceles rufescens* (Dufour)**

Plate 10, figures 5–8

Scytodes rufescens DUFOUR, 1820, p. 203, pl. 77, fig. 5.

Loxosceles rufescens: SIMON, 1914, pp. 75–76, fig. 126. BONNET, 1957 (1945–1957, vol. 2. pt. 3), p. 2575. ROEWER, 1942 (1942–1954, vol. 1), p. 319 (*Loxoscelis*). GERTSCH, 1958, p. 31, figs. 60–62, 73.

Loxosceles marylandica MUMA, 1944, p. 2, fig. 1.

Coloration and structure similar to those of *gaucho*, but carapace lacking dark side bands or spots.

FEMALE FROM ALTO DOURO, PORTUGAL: Total length, 7.5 mm. Carapace 3.2 mm. long, 2.7 mm. wide.

Clypeus quite wide, equal to nearly three full diameters of median eye. Median eyes separated from lateral by one and one-fourth diameters. Eye row moderately recurved; line along front edges of lateral eyes falling behind median by one-fourth of their diameter.

	I	II	III	IV	Palp
Femur	4.3	4.7	4.0	4.6	1.1
Patella	1.0	1.0	0.9	1.0	0.4
Tibia	4.5	4.8	3.6	4.2	0.9
Metatarsus	4.5	5.1	4.3	5.0	—
Tarsus	1.1	1.2	1.1	1.2	1.4
Total	15.4	16.8	13.9	16.0	3.8

Leg formula, 2413. First leg 4.8 times as long, first femur 1.3 times as long, as carapace.

Epigynum (pl. 10, fig. 8) similar to that of *amazonica* but lacking the cluster of small receptacles at the apex of each unit.

MALE FROM ROME, ITALY: Total length, 7 mm. Carapace 3 mm. long, 2.6 mm. wide.

Clypeus narrower and eyes somewhat closer together than those of female.

	I	II	III	IV	Palp
Femur	5.4	6.2	5.0	5.3	1.3
Patella	1.0	1.1	1.0	1.0	0.4
Tibia	6.2	7.4	5.0	5.5	0.9
Metatarsus	6.2	7.6	6.0	7.0	—
Tarsus	1.3	1.3	1.1	1.4	0.5
Total	20.1	23.6	18.1	20.2	3.1

Leg formula, 2413. First leg 6.7 times as long, first femur 1.8 times as long, as carapace.

Palpus (pl. 10, figs. 5–7) similar to that of *amazonica*, but differing as follows: Femur thin, about four times as long as dorsal width. Patella globular, nearly as broad as long. Tibia inflated, one and one-half times as long as broad (0.95 mm./0.57 mm.) and as deep as breadth. Tarsus suboval, slightly longer than broad. Bulb enlarged, in side view as large as, or even exceeding, tarsus in size. Embolus curved, somewhat longer than length of bulb.

TYPE DATA: Of *Scytodes rufescens*, near Sagunto, Valencia Province, Spain, original specimens probably lost; of *Loxosceles marylandica*, College Park, Maryland, male holotype in the American Museum of Natural History.

DISTRIBUTION: See discussion above. There are no authentic records for South America.

THE *laeta* GROUP

This large assemblage of 24 known species takes its name from *Loxosceles laeta* (Nicolet), the largest South American species, but it also includes others of medium to small size. The carapaces of most of these do not bear especially contrasting dark bands or spots on the sides, but the pars cephalica is in most cases dark brown. In a few species, notably *surca* and *rufipes*, a distinctive pattern is evident on the sides, and in these and others a series of dusky lines or bands are often present on the pars cephalica. In this group the legs vary quite widely in total length according to the species, and there is also considerable variation within the species. In *conococha* the female has the first leg only 3.4 times the length of the carapace, whereas in *inca* this leg is 6.2 times as long. The legs of the males are typically longer and thinner than those of the females, and for the

TABLE 1

LEG FORMULAS, RATIOS, AND MEASUREMENTS OF FEMALES OF THE *Loxosceles laeta* GROUP

Species	Formula	Leg I/Carapace	Femur I/ Carapace	Tibia II	Tibia IV
<i>laeta</i>	4213	3.8	1.08	5.5	5.8
<i>weyrauchi</i>	4213	4.0	1.16	5.6	5.7
<i>conococha</i>	4213	3.4	0.95	4.3	4.7
<i>herrerii</i>	4213	4.5	1.3	6.8	6.7
<i>blancasi</i>	4213	3.6	1.05	4.2	4.3
<i>surca</i>	4213	3.6	1.0	3.1	3.7
<i>julia</i>	4213	4.0	1.1	6.5	6.5
<i>olmea</i>	4213	4.0	1.1	4.0	3.8
<i>pucara</i>	4213	4.2	1.2	4.1	4.0
<i>rosana</i>	4213	4.6	1.3	7.5	7.0
<i>piura</i>	4213	3.9	1.1	3.7	3.6
<i>coquimho</i>	4213	4.4	1.24	4.2	4.4
<i>lutea</i>	2413	4.1	1.1	4.0	3.9
<i>accepta</i>	2413	5.1	1.4	6.7	6.3
<i>bettyae</i>	2413	4.2	1.1	4.8	4.2
<i>gloria</i>	2413	4.7	1.2	5.5	4.7
<i>frizzelli</i>	2413	4.3	1.2	5.0	4.5
<i>alicea</i>	2413	5.5	1.5	9.1	7.8
<i>harrietae</i>	2413	4.8	1.38	7.0	6.2
<i>inca</i>	2143	6.2	1.7	8.3	6.6
<i>taeniopalpis</i>	2413	4.7	1.35	5.0	4.6
<i>rufipes</i>	2413	3.9	1.1	3.4	3.2
<i>rufipes</i>	2143	5.0	1.4	4.8	4.2
<i>lawrencei</i>	2143	4.8	1.3	3.7	3.1
<i>panama</i>	2413	5.0	1.3	5.0	4.5

above-mentioned species the first leg ranges from 4.7 times as long in *conococha* to 7.6 times in *inca*. The other legs also show similar or even greater length discrepancies among the species. For the most part the metatarsi of the males are thin and essentially straight, but in *gloria*, *piura*, *herrerii*, and *laeta* the first metatarsus, which forms a stiff rod in spite of its thinness, has a distinct sinuous curve in the middle portion.

The leg formulas afford characters for separation of some of the taxa in this group. The fourth leg exceeds the others in length in females of 12 species, all of which have the formula 4213, but the second leg is longest in most of the remaining species. Only one male, *laeta*, has the leg formula 4213, whereas the second leg is longest in all other known males. The females of *weyrauchi*, *conococha*, *herrerii*, and *piura*, all with the 4213 leg formula, thus have males with the formula 2413.

Some of the key measurements and com-

parison standards for the *laeta* group are brought together in tables 1 and 2. Data on only one female of *laeta* are offered, but additional leg variation is available in the description. Two females of *rufipes* are listed because of the different formulas represented.

The genitalia are quite variable in both sexes but present characters that quite easily identify the group and the species. The segments of the male palpus are typically quite long, with extremes between *laeta*, with long thin femur and tibia, and *lutea*, with these elements quite short and thick. In every species the tarsus is an inconspicuous, short segment about as broad as long. The patellae are about twice as long as broad and proportionately of greatest size in *bettyae* and *lutea*. The male genital organs are quite stereotyped in design. The bulbs are suboval in form and show little variation except for size in relation to that of the tarsus. The emboli vary in size, length, and curvature according to the spe-

TABLE 2

LEG FORMULAS, RATIOS, AND MEASUREMENTS OF MALES OF THE *Loxosceles laeta* GROUP

Species	Formula	Leg I/ Carapace	Femur I/ Carapace	Tibia II	Tibia IV
<i>laeta</i>	4213	6.1	1.6	7.7	7.6
<i>weyrauchi</i>	2413	5.7	1.4	8.1	7.1
<i>conococha</i>	2413	4.7	1.2	7.6	6.6
<i>herrerri</i>	2413	5.8	1.5	10.3	8.4
<i>piura</i>	2413	5.4	1.4	5.3	4.8
<i>lutea</i>	2413	5.0	1.3	4.6	4.1
<i>accepta</i>	2413	7.5	2.0	10.7	9.4
<i>bettyae</i>	2143	5.9	1.5	6.1	5.0
<i>gloria</i>	2413	6.0	1.6	6.9	5.5
<i>frizzelli</i>	2413	6.1	1.6	7.9	6.2
<i>inca</i>	2143	7.6	2.1	9.3	6.7
<i>taeniopalpis</i>	2413	5.6	1.5	6.5	5.5
<i>rufipes</i>	2143	7.0	2.0	5.7	4.7
<i>panama</i>	2143	7.0	1.9	7.1	5.6

cies. The segments of the male palpi are liberally supplied with suberect setae, some of them very long and thin, but their number and size are relatively constant in the group. In only one species, *frizzelli*, are setae on the tarsi modified to a distinctive flattened form to make them useful taxonomic features. The epigyna are far more variable than the male palpi. In some species (*inca*, *taeniopalpis*, and others) the receptacles are thin-walled and lightly pigmented, and they are easily destroyed by dissection and hard to study in slide preparations. In others the receptacles are heavily chitinized and rather easy to see in fullest detail. In most cases the receptacles are large and set together, only rarely being separated by more than twice their width at the base. Whereas variation in size and structure of the receptacles is considerable, the quite wide differences between the species are not bridged by intermediate forms.

KEY TO THE MALES OF THE *laeta* GROUP

1. Fourth leg longer than second; tibiae II and IV subequal in length . . . *laeta* (Nicolet)
Second leg longer than fourth; tibia II usually clearly longer than tibia IV 2
2. First metatarsus with distinct sinuous curve in middle portion 3
First metatarsus essentially straight 5
3. Tibia of palpus 3.5 times as long as wide; tibia II much longer than tibia IV (10.3

- mm./8.4 mm.) *herrerri*, new species
Tibia of palpus only twice as long as wide . . . 4
4. First metatarsus strongly curved
. *gloria*, new species
First metatarsus lightly curved
. *piura*, new species
5. Tarsus of male palpus with comb of four or five enlarged setae . . . *frizzelli*, new species
Tarsus without such enlarged setae 6
6. Tibia of palpus about twice as long as broad 7
Tibia of palpus from 2.5 to 3.5 times as long as broad 11
7. Embolus three times as long as bulb
. *rufipes* (Lucas)
Embolus usually less than twice as long as bulb 8
8. Patella of palpus about two-thirds of length of tibia 9
Patella of palpus about one-half of length of tibia 10
9. Patella of palpus enlarged (pl. 9, fig. 9)
. *bettyae*, new species
Patella of palpus normal . . . *piura*, new species
10. Segments of palpus short and stout (pl. 10, fig. 1) *lutea* Keyserling
Segments of palpus of medium length (pl. 9, fig. 1) *accepta* Chamberlin
11. Tibia of palpus at least three times as long as wide 13
Tibia of palpus about 2.5 times as long as wide 12
12. Tibia of palpus stout, inflated on sides and below; bulb and embolus as shown in plate 8, figure 9. *conococha*, new species
Tibia of palpus not as above; bulb and embo-

- lus as shown in plate 11, figure 3; known only from Panama . . . *panama* Gertsch
13. Femur of palpus twice as long as tibia (pl. 11, figs. 11, 12) *inca*, new species
Femur of palpus about 1.5 times as long as tibia 14
14. Tibia of palpus 3.5 times as long as wide (pl. 11, fig. 6) *taeniopalpis* Simon
Tibia of palpus three times as long as wide (pl. 8, fig. 8) *weyrauchi*, new species

KEY TO THE FEMALES OF THE *laeta* GROUP

1. Fourth leg longer than second 2
Second leg longer than fourth 12
Fourth and second legs equal 23
2. Tarsus of palpus enlarged, as in *lutea* (pl. 6, fig. 11) *coquimbo*, new species
Tarsus of palpus normal, evenly tapered . . . 3
3. Receptacle of epigynum with thin tubular extension typically enlarged at apex and usually much exceeding width of basal pouch 4
Receptacle of epigynum broad at base, with or without apical finger 10
4. Tube of receptacle with bulbular enlargement at apex 5
Tube of receptacle without such enlargement *olmea*, new species
5. Basal pouch of receptacle about as broad as length of entire receptacle
Basal pouch at most half as long as receptacle *julia*, new species 6
6. Basal pouch rounded, without distinct lateral extension 7
Basal pouch with lateral angle, tubercle, or short blind finger 9
7. Carapace with pattern of dusky patches along sides of pars thoracica . . . *surca*, new species
Carapace without such pattern 8
8. First femur about as long as carapace (4.0/4.2) *blancasi*, new species
First femur longer than carapace (5.2/4.5) *weyrauchi*, new species
9. Receptacle of epigynum with small, blind, tubular sac (pl. 8, fig. 3), first femur 1.3 times as long as carapace
Receptacle of epigynum with small angle, tubercle, or blind sac; first femur typically 1.1 times as long as carapace
Receptacles of epigynum separated by width of basal pouch (pl. 10, fig. 16) *laeta* (Nicolet)
10. Receptacles of epigynum separated by width of basal pouch (pl. 10, fig. 16) *pucara*, new species
Receptacles less separated at base 11
11. Median eyes separated from lateral by nearly two diameters; epigynum as shown in plate 10, figure 10 *rosana*, new species
Median eyes separated by one and one-half diameters; epigynum as shown in plate 7, figure 12 *piura*, new species
12. First femur 1.7 times as long as carapace *inca*, new species
First femur at most 1.5 times as long as carapace 13
13. Tarsus of palpus enlarged (pl. 6, fig. 11) *lutea* Keyserling
Tarsus of palpus normal, evenly tapered . . 14
14. Receptacle of epigynum bifid at apex . . . 15
Receptacle of epigynum undivided at apex . . . 17
15. Apical lobe of receptacle a rounded sac (pl. 10, fig. 15) *taeniopalpis* Simon
Apical lobe a thin finger 16
16. Apical fingers of receptacle dissimilar in size (pl. 11, figs. 15, 16) . . . *rufipes* (Lucas)
Apical fingers of receptacle of equal size (pl. 11, fig. 14) *lawrencei* Caporiacco
17. Receptacles of epigynum small, widely separated, rounded sacs (pl. 11, fig. 7) *panama* Gertsch
Receptacles of different form, not so widely spaced 18
18. Receptacle a voluminous sac broadly rounded at apex 19
Receptacle produced apically into narrow finger 22
19. Receptacle much longer than basal width *frizzelli*, new species
Receptacle about as long as basal width . . 20
20. Receptacle with small lateral angle or finger 21
Receptacle without such development *alicea*, new species
21. Receptacle as shown in plate 7, figure 10 *harrietae*, new species
Receptacle as shown in plate 9, figures 7, 8 *accepta* Chamberlin
22. Receptacle as shown in plate 9, figure 10 *bettyae*, new species
Receptacle as shown in plate 9, figures 3, 6 *gloria*, new species
23. Tarsus of palpus normal, evenly tapered *rufipes* (Lucas)
Tarsus of palpus enlarged at middle (pl. 6, fig. 11) *lutea* Keyserling

Loxosceles laeta (Nicolet)

Plate 6, figures 1-9; plate 7, figures 1-5, 8, 9;
text figure 3

Scytodes rufipes: NICOLET, 1849, p. 348; 1854, pl. 1, fig. 11.

Scytodes laeta NICOLET, 1849, p. 349; 1854, pl. 2, fig. 3. SIMON, 1864, p. 46 (*Scytoda lata*). KEYSERLING, 1877, p. 217.



FIG. 3. Distribution of *Loxosceles laeta* (Nicolet) in South America.

Scytodes nigella NICOLET, 1849, p. 350; 1854, pl. 2, fig. 4. SIMON, 1864, p. 46 (*Scytoda*). KEYSERLING, 1877, p. 217.

Scytodes flavescens NICOLET, 1849, p. 350 (*nomen nudum: lapsus for laeta*). SIMON, 1864, p. 46 (*Scytoda*).

Omosita bicolor HOLMBERG, 1876, p. 17.

Loxosceles nigella: BOERIS, 1889, p. 129.

Loxosceles galapagoensis MARX, 1889 [1890], pp. 208, 210 (*nomen nudum*). BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2574.

Loxosceles rufipes: KEYSERLING, 1877, p. 214, pl. 7, fig. 5; 1891, p. 167 (part). SIMON, 1893a, p. 437 (part). BÜCHERL, 1960, pp. 73–77; 1961, pp. 213–224, fig. 2b; 1962, pp. 66–69.

Loxosceles flavescens: SIMON, 1893b, p. 272; 1897a, pp. 105, 106, 107. PETRUNKEVITCH, 1911, p. 117. ROEWER, 1942 (1942–1954, vol. 1), p. 320 (*Loxoscelis*). BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2574. BÜCHERL, 1961, p. 219.

Loxosceles laeta: SIMON, 1900, p. 49; 1907, pp. 246, 247. PETRUNKEVITCH, 1911, p. 118. MELLO-LEITÃO, 1918, p. 127; 1933, p. 21; 1934, pp. 69, 72; 1940, p. 236; 1941, p. 107; 1942, p. 381; 1943, p. 154; 1944b, p. 312; 1945, p. 214; 1947, p. 233. CHAMBERLIN, 1920, p. 40. ESCOMEL, 1929, p. 377 (*laeta*). VELLARD, 1936, p. 269. BÜCHERL, 1952, pp. 133, 146–148; 1956, p. 3; 1960, pp. 73–77; 1962, pp. 66–69. BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2574. GERTSCH, 1961, pp. 2–4.

Loxosceles longipalpus BANKS, in Banks and Snodgrass, 1902, pp. 55, 71. SIMON, 1907, p. 248. PETRUNKEVITCH, 1911, p. 118. BANKS, 1930, p. 272.

Loxosceles nesophila CHAMBERLIN, 1920, p. 4, pl. 4, fig. 6. ROEWER, 1942 (1942–1954, vol. 1), p. 321 (*Loxoscelis*). BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2575. BÜCHERL, 1961, p. 219.

Loxosceles yura CHAMBERLIN AND IVIE, 1942, p. 5, figs. 1–3.

DIAGNOSIS: This large, variable species is quite readily identified by distinctive features of the genitalia of both sexes. The male palpus is typically pale yellowish brown, except for the darker tarsus, and has the segments elongated. The thin femur, which varies from eight to 10 times as long as its greatest breadth, equals about one-half to two-thirds of the lateral width of the tibia. The patella is a thin segment less than half of the length of the tibia. The tibia varies considerably in thickness from three to four times as long as its lateral width. The leg formula of the male is usually 4213, but the fourth leg is only slightly longer. Occasionally the second leg is slightly longer, and the formula becomes

2413. The females are most readily recognized by the size and shape of the seminal receptacles of the epigynum. The long, tubular receptacle has a transverse enlargement or pouch at the base, which is usually angled or produced into a distinct tubercle or short blind finger. The leg formula of the female is invariably 4213, with the fourth leg clearly longer. There is considerable variation in the proportional leg lengths of some females. In those measured, the first leg varied from 3.5 times to 4.38 times that of the carapace length.

A close study was made of the rather generous series of *laeta* from numerous localities to determine whether the variability present was the result of admixture of two or more sibling species. Some of the males have palpi with obviously thinner tibiae, whereas others have these tibiae more strongly incrassated. A rather complete gradation between the extremes was noted in males from all parts of the distribution. It was not possible to correlate these differences with features of the epigyna, of the leg proportions, or with geographical areas. The two males from the Galapagos Islands (one of them the type of *longipalpus*) have proportionately the longest palpi, but not enough material is available to indicate whether they represent a distinct subspecies.

COLORATION: General appearance essentially like that of *gaucho* and related species. Color in life gray, tawny, brown, or even blackish, probably as result of thick covering of hairs and setae. Color of preserved specimens, which are usually partially or entirely divested of hairs and setae by handling and preservation, varying from pale yellowish to orange or reddish brown. Juvenile, immature, and subadult specimens yellowish; young males and females yellowish to orange-brown; old females usually largest and darkest, reddish or dusky brown. Cave specimens usually paler than surface forms.

STRUCTURE: Size of adult females, 7 mm. to 15 mm.; average, about 10 mm. in total body length. Size of adult males, 6 mm. to 12 mm.; average, about 8 mm.

Structure in both sexes similar in most respects to that of *gaucho*. Dorsal view of female from Santiago, Chile, as shown in plate 6, figure 5. Clypeus rather wide, equal to three

full diameters of median eyes. Median eye separated from lateral by one and one-third diameters of former. Front eye row moderately recurved; line along front edge of lateral eye falling behind median by about one-fourth of their diameter. Eyes somewhat variable in curvature and nearness of median to lateral eyes.

Carapace of male from Lima, Peru, as shown in plate 6, figure 1. Carapace proportionately narrower than that of female, with pars cephalica distinctly triangular in shape. Clypeus narrower, equal to about two full diameters of median eye. Eyes closer together than those of female, but recurvature about same. Males somewhat variable in size, seeming robustness of body, thickness of legs, but these differences are presumably result of growth differences, molting variability, and other factors.

Carapace and abdomen of female from Santiago, Chile, as shown in plate 6, figure 5. Integument of carapace varying from whitish to yellow or orange, without obvious dusky or blackish pattern on sides, but entire pars cephalica dusky to dark reddish brown, darkest on clypeus. Pars cephalica usually U-shaped behind, enclosing pattern of impressed longitudinal lines as in *gaucho*, but these lines often quite indistinct. Carapace clothed thickly with fine, procumbent, blackish hairs and set with suberect bristles as follows: row of long ones on side margins; radiating rows on pars thoracica; and many on pars cephalica to give hairy or bristly appearance.

FEMALE FROM LIMA, PERU: Total length, 13 mm. Carapace 5.1 mm. long, 4.1 mm. wide.

	I	II	III	IV	Palp
Femur	5.5	5.8	5.4	6.4	1.7
Patella	1.7	1.7	1.7	1.7	0.8
Tibia	5.3	5.5	4.4	5.8	1.2
Metatarsus	5.1	5.5	5.2	6.7	—
Tarsus	1.7	1.7	1.5	2.0	1.7
Total	19.3	20.2	18.2	22.6	5.4

Leg formula, 4213. First leg 3.8 times as long, first femur 1.08 times as long, as carapace.

Epigynum consisting of two tubular receptacles lying quite close together on ventral face of bursa copulatrix. Atriobursal orifice a

wide slit communicating with quite broad basal pouch from which long, apically rounded finger arises. Width of basal pouch nearly half as long as tubular receptacle. Outer corner of basal pouch more strongly sclerotized, usually with distinct angle, in some cases with small conical finger. Epigyna of six females from Peru and Brazil showing variation (pl. 6, figs. 3, 4, 6-9).

MALE FROM LIMA, PERU: Total length, 9.5 mm. Carapace 4.1 mm. long, 3.7 mm. wide.

	I	II	III	IV	Palp
Femur	6.5	7.2	6.5	7.5	4.2
Patella	1.7	1.7	1.7	1.7	1.3
Tibia	7.5	7.7	6.0	7.6	2.7
Metatarsus	7.4	8.5	7.3	9.2	—
Tarsus	2.2	2.2	1.8	2.0	0.5
Total	25.3	27.3	23.3	28.0	8.7

Leg formula, 4213. First leg 6.1 times as long, first femur 1.6 times as long, as carapace. Fourth leg longer than second but proportionately less so than in female. First metatarsus long, straight in side view, but with sinuous curvature beyond middle as seen in dorsal view, set with series of curved black setae in middle portion.

Male palpus (pl. 7, figs. 4, 5) with segments long and quite thin. Femur a thin rod about eight times as long as greatest width, about half as wide as tibia in lateral view. Patella somewhat less than half of length of tibia. Tibia about three times as long as broad. Tarsus suboval, as broad as long. Bulb about equal to tarsus in size. Embolus evenly curved, twice as long as height of bulb.

FEMALE FROM AREQUIPA, PERU: Total length, 9.7 mm. Carapace 4.7 mm. long, 3.8 mm. wide.

	I	II	III	IV	Palp
Femur	5.3	5.7	5.2	6.2	1.7
Patella	1.5	1.5	1.5	1.5	0.7
Tibia	5.3	5.7	4.5	6.0	1.2
Metatarsus	5.0	5.6	5.2	7.0	—
Tarsus	1.7	1.7	1.6	1.8	1.5
Total	18.8	20.2	18.0	22.5	5.1

Leg formula, 4213. First leg four times as long, first femur 1.1 times as long, as carapace.

Epigynum of above specimen shown in plate 6, figure 6. Basal pouches relatively narrow, with conspicuous triangular finger.

FEMALE FROM CAPAC, PERU: Total length, 12 mm. Carapace 6 mm. long, 4.7 mm. wide.

	I	II	III	IV	Palp
Femur	6.0	6.5	5.9	6.8	2.0
Patella	2.0	2.0	1.9	1.9	0.8
Tibia	5.9	6.2	5.0	6.1	1.5
Metatarsus	5.7	6.2	5.7	7.2	—
Tarsus	1.8	1.8	1.7	1.8	2.0
Total	21.4	22.7	20.7	23.8	6.3

Leg formula, 4213. First leg, 3.5 times as long, first femur as long, as carapace.

Epigynum (pl. 6, fig. 8) with quite long receptacles and with wide pouches bearing conspicuous, anteriorly directed, blind finger.

FEMALE FROM NEGRITOS, PERU: Total length, 9 mm. Carapace 4.3 mm. long, 3.3 mm. wide.

	I	II	III	IV	Palp
Femur	5.3	5.7	5.2	6.5	1.6
Patella	1.5	1.5	1.5	1.5	0.6
Tibia	5.2	5.5	4.3	5.7	1.1
Metatarsus	5.1	5.6	5.2	7.3	—
Tarsus	1.7	1.7	1.6	1.7	1.6
Total	18.8	20.0	17.8	22.7	4.9

Leg formula, 4213. First leg 4.38 times as long, first femur 1.25 times as long, as carapace. Legs of this female proportionately longer than those of other females in this collection, probably representing the extreme for the population. Epigynum like that of typical *laeta* (pl. 6, fig. 4).

FEMALE FROM PARIÑAS VALLEY, PIURA, PERU: Total length, 9.5 mm. Carapace 5.3 mm. long, 4.3 mm. wide.

	I	II	III	IV	Palp
Femur	5.8	6.0	5.4	6.3	1.7
Patella	1.6	1.7	1.7	1.7	0.7
Tibia	5.5	5.6	4.1	5.5	1.3
Metatarsus	5.6	6.0	1.5	6.5	—
Tarsus	1.5	1.5	1.3	1.5	1.7
Total	20.0	20.8	14.0	21.5	5.4

Leg formula, 4213. First leg 3.6 times as long, first femur 1.1 times as long, as carapace.

FEMALE HOLOTYPE OF *nesophila*, LOBOS DE TIERRA ISLAND, PERU: Total length, 10.5 mm. Carapace 4.5 mm. long, 3.8 mm. wide.

	I	II	III	IV	Palp
Femur	5.6	5.8	5.4	6.4	1.7
Patella	1.5	1.5	1.5	1.5	0.6
Tibia	5.5	5.7	4.5	6.0	1.1
Metatarsus	5.4	5.9	5.2	7.1	—
Tarsus	1.8	1.7	1.5	1.8	1.6
Total	19.8	20.6	18.1	22.8	5.0

Leg formula, 4213. First leg 4.4 times as long, first femur 1.2 times as long, as carapace.

MALE FROM LIMA, PERU: Total length, 9.5 mm. Carapace 4.1 mm. long, 3.7 mm. wide.

	I	II	III	IV	Palp
Femur	6.5	7.2	6.5	7.5	4.2
Patella	1.7	1.7	1.7	1.7	1.3
Tibia	7.5	7.7	6.0	7.6	2.7
Metatarsus	7.4	8.5	7.3	9.2	—
Tarsus	2.2	2.2	1.8	2.0	0.5
Total	25.3	27.3	23.3	28.0	8.7

Leg formula, 4213. First leg 6.1 times as long, first femur 1.6 times as long, as carapace. Fourth leg longer than second but proportionately less so than in female. First metatarsus long, straight in side view, but with sinuous curvature beyond middle as seen in dorsal view, set with series of curved black setae in middle portion.

Male palpus with segments long and quite thin. Femur a thin rod about eight times as long as greatest width, about half as wide as tibia in lateral view. Patella somewhat less than half of length of tibia. Tibia about three times as long as broad. Tarsus suboval, as broad as long. Bulb about equal to tarsus in size. Embolus evenly curved, twice as long as height of bulb.

MALE FROM AREQUIPA, PERU: Total length, 9.5 mm. Carapace 3.7 mm. long, 3.1 mm. wide.

	I	II	III	IV	Palp
Femur	5.2	6.0	5.2	6.2	3.4
Patella	1.3	1.3	1.3	1.3	1.1
Tibia	5.7	6.7	5.0	6.4	2.3
Metatarsus	5.8	7.0	5.7	7.7	—
Tarsus	2.0	2.0	1.6	1.9	0.5
Total	20.0	23.0	18.8	23.5	7.3

Leg formula, 4213. First leg 5.4 times as long, first femur 1.45 times as long, as carapace.

Male palpus as shown in plate 7, figure 8. Femur as long as wide, two-thirds as wide as lateral width of tibia. Tibia four times as long as its lateral width.

MALE FROM NEGRITOS, PIURA, PERU: Total length, 8.3 mm. Carapace 4 mm. long, 3.5 mm. wide.

	I	II	III	IV	Palp
Femur	6.3	7.2	6.2	7.3	4.0
Patella	1.5	1.6	1.5	1.5	1.2
Tibia	7.0	7.8	5.7	7.5	2.7
Metatarsus	7.0	8.5	7.3	9.1	—
Tarsus	2.2	2.2	1.8	2.3	0.5
Total	24.0	27.3	22.5	27.7	8.4

Leg formula, 4213. First leg six times as long, first femur 1.57 times as long, as carapace.

Male palpus: Femur eight times as long as wide, half as wide as lateral width of tibia. Tibia three times as long as its lateral width.

MALE FROM PARIÑAS VALLEY, PIURA, PERU: Total length, 8.5 mm. Carapace 4 mm. long, 3.5 mm. wide.

	I	II	III	IV	Palp
Femur	5.8	6.3	5.6	6.4	3.8
Patella	1.4	1.5	1.4	1.5	1.2
Tibia	6.3	6.7	5.1	6.2	2.6
Metatarsus	6.6	7.4	6.3	7.7	—
Tarsus	1.8	1.9	1.6	1.8	1.1
Total	21.9	23.8	20.0	23.6	8.7

Leg formula, 2413, first and fourth legs about equal in length. Second tibia slightly longer than fourth tibia. First leg 5.5 times as long, first femur 1.45 times as long, as carapace.

Male palpus: Femur eight times as long as wide, about two-thirds as wide as lateral width of tibia. Tibia 3.3 times as long as lateral width.

MALE TYPE OF *longipalpus* BANKS, GALAPAGOS ISLANDS, ECUADOR: Total length, 7.7 mm. Carapace 3.9 mm. long, 3.4 mm. wide.

	I	II	III	IV	Palp
Femur	5.7	6.5	5.7	6.5	3.7
Patella	1.6	1.6	1.6	1.6	1.3
Tibia	6.1	6.8	5.4	6.7	2.6
Metatarsus	6.4	7.5	6.6	8.2	—
Tarsus	1.7	1.5	1.3	1.7	0.5
Total	21.5	23.9	20.6	24.7	8.1

Leg formula, 4213. First leg 5.5 times as long, first tibia 1.4 times as long, as carapace. Second and fourth tibiae subequal in length. First metatarsus moderately curved.

Male palpus as shown in plate 7, figures 1-3. Femur 10 times as long as wide, about half as wide as lateral width of tibia. Tibia four times as long as its lateral width.

TYPE DATA: Female types of *Scytodes laeta* Nicolet and *S. nigella* Nicolet from Chile; original material heretofore presumed to be lost, but probably still in the Muséum National d'Histoire Naturelle, in Paris, where many of Nicolet's specimens are now known to have been deposited. Female type of *Omosita bicolor* Holmberg from Buenos Aires, Argentina, lost. Female type of *Loxosceles nesophila* Chamberlin from Lobos de Tierra Island, Piura, Peru, in the Museum of Comparative Zoology. Male type of *Loxosceles longipalpus* Banks from the Galapagos Islands, Ecuador, in the Museum of Comparative Zoology. Male holotype of *Loxosceles yura* Chamberlin and Ivie from Yura, Arequipa, Peru, August 10, 1939 (K. P. Schmidt), in the Field Museum of Natural History, Chicago.

DISTRIBUTION: Widespread in South America (see fig. 3) from Chile, Peru, and Ecuador eastward into Argentina, Brazil, and adjacent countries, northward through Ecuador and Colombia into Guatemala and Spanish Honduras. Only verified records are mapped.

RECORDS: Peru: Arequipa: Arequipa, 2340 meters, July 12, 17, 1961, 1962 (E. Córdoba),

males and females. Yura, August 10, 1939 (K. P. Schmidt), males and females, immature; August 17, 1941 (C. Colin), female, immature, Atiquipa, 200 meters, December 11, 1951 (W. Weyrauch), female, immature. Capac, Chala (W. Weyrauch), female, immature. Junin: Utcuyacu, March, 1948 (F. Woytkowski), female, immature. Chanchamayo Valley, April, 1939 (W. Weyrauch), four females. Huánuco: Ambo, 2100 meters, near Huánuco (W. Weyrauch), male. Tingo Maria, April, 1940 (W. Weyrauch), female. Piura: Negritos, January–December, 1938–1941 (H. E. Frizzell, D. L. Frizzell), many males and females, adult, during all months of year. Pariñas Valley, April 7, 1939 (H. E. Frizzell, D. L. Frizzell), male and female, immature; October 9, 1938 (H. E. Frizzell, D. L. Frizzell), females, immature; September 24, 1938 (H. E. Frizzell, D. L. Frizzell) females, immature. Cabo Blanco, December 7, 1941 (Robin Wells), male. Five miles west of Sullana, January 15, 1939 (H. E. Frizzell, D. L. Frizzell), two males, four females, immature. El Alto, February 2, 1940 (A. Walls), male; December, 1940 (Robin Wells), male, immature; August, 1939 (C. J. C. Ewing), female. Quebrada Mogollon, January 11, 1939 (H. E. Frizzell, D. L. Frizzell), one male, females, immature; June 18, 1939 (H. E. Frizzell, D. L. Frizzell), one female, immature. Isla Lobos de Tierra, January, 1920, one female, holotype of *nesophila*. Ica: North Chíncha Island, December, 1940, to January, 1941 (W. Vogt), females, immature. South Chíncha Island, February 23, 1933, females. La Libertad: Hacienda Cartavio, near Trujillo, June–July, 1939 (W. Weyrauch), two females, immature. Lima: Lima, January, 1939 (W. Weyrauch), numerous males, females, immature, in houses and gardens; August 10, 1962 (O. Meneus), males, females, in houses and chicken coops; February, 1965 (R. Garcia), in stone walls; March, 1965 (P. Aguilar), two males, eight females, immature, in houses. Lake Villa, near Lima, October, 1951 (W. Weyrauch), two females. Hills near Asia, September, 1951 (W. Weyrauch), males, females, immature. Hills near Pachacamac, 350 meters, September, 1951 (W. Weyrauch), females. Cajamarquilla, May, 1965 (P. Aguilar), male, penultimate male.

La Molina, August, 1965 (P. Aguilar), females, Callao, September, 1964 (L. Perez), female; November 16, 1950 (E. Ross, A. Michelbacher) male, female. Mala, November, 1964 (M. Guerovic), immature in banana fields. Playa La Chira, July, 1965 (P. Aguilar), female, near shore, under stone. San Bartolo (L. Gonzales), two males, female. Quebrada Verde, 250 meters (P. Aguilar), two males; August–November (W. Weyrauch), males, females, immature. Ricordo Palma, Rio Rimac, June 23, 1951 (W. Weyrauch), two females. Surco, Rimac Valley, 2000 meters, October 9, 1963 (H. Herrero, P. Wygodzinsky), female, immature. Four kilometers west of Surco, 1900 meters, August 17, 1965 (P. and B. Wygodzinsky), females, immature. Chosica, June–November, 1932, in stone piles. *Chile*: Tarapacá: Pisagua, November, 1941 (Junius Bird), males, females. Caleta Hueso, January 28 to February 4, 1941 (Junius Bird), immature. Lluta River Valley, near Arica (G. Mann), female, immature. Tarapacá (Bücherl, 1961). Talca: Talca (Bücherl, 1961). Antofagasta: Antofagasta (A. Macchiavello), males, females. Valparaíso: Casablanca, January–March, 1955 (Edwin Reed), female. Viña del Mar (Bücherl, 1961). Osorno: Purránque, January–March, 1955 (Edwin Reed), female. Santiago: Santiago, October, 1953 (H. Toaog), male; (G. Mann), immature female; (Bücherl, 1961). Cerro Blanco, October, 1961 (Sra. Fraczinek), immature. Coquimbo: La Serena, August 6, 1961 (A. F. Archer), female (Bücherl, 1961). Quintero: Las Dunas, Valparaíso, May 11, 1962 (A. F. Archer), female. *Ecuador*: Galapagos Islands: (Banks, 1902). Hood Island, May 18, 1899, one male. Duncan Island, June 25, 1929 (H. H. Cleaves), two immature females. *Brazil*: Paraibo to Rio Grande do Sul (Bücherl, 1952). São Paulo: Ipiranga (Moenkhaus, 1898). Francisco Sodré, Cerqueira Cesar, San Carlos, Pindamonhargaba (all Bücherl, 1961). Rio de Janeiro: Barcelos (Bücherl, 1961). Minas Gerais: Riacho da Cruz (Bücherl, 1961). Rio Grande do Sul: Santo Angelo (Bücherl, 1952; 1961). Pelotas, July 1, 1958 (C. Biezanko), female; November 19, 1953 (C. Biezanko), females. Porto Alegre, 1935, female. Paraná: Vale de Ribeira (Mello-Leitão, 1940). Ponta

Grossa, August 27, 1953 (C. Biezanko), female. *Uruguay*: Montevideo (Keyserling, 1877; Witkind, 1953, Bücherl, 1961). *Argentina*: (Simon, 1907). La Rioja: Nonogasta (Mello-Leitão, 1941). Santiago del Estero: (Mello-Leitão, 1942). Villa Union (J. Abalos), immature. Córdoba: Córdoba, male, female. Buenos Aires: (Holmberg, 1876; Mello-Leitão, 1944b). Entre Rios: Rosario Tala (Mello-Leitão, 1945). Salta: Santa Barbara Mojon, Tolombon, Salta (Mello-Leitão, 1941).

***Loxosceles weyrauchi*, new species**

Plate 8, figures 7, 8, 11

This interesting and quite widespread Peruvian species of the *laeta* complex is named for W. Weyrauch, who has collected many of the species on which this paper is based.

DIAGNOSIS: The species is readily differentiated from others by features of the genitalia. The segments of the male palpus are much shorter and stouter than those of *laeta*. The epigynum differs significantly from that of *laeta*, as shown in the illustrations. The female of *weyrauchi* has the same leg formula as that of *laeta*, 4213, but the male has the second leg longer than the first in the formula 2413.

Coloration and structure essentially identical with those of *laeta*.

FEMALE FROM AMBO, PERU: Total length, 10 mm. Carapace 4.5 mm. long, 3.6 mm. wide.

	I	II	III	IV	Palp
Femur	5.2	5.8	5.2	6.1	1.5
Patella	1.5	1.5	1.5	1.5	0.5
Tibia	5.2	5.6	4.5	5.7	1.2
Metatarsus	5.2	5.6	5.0	6.7	—
Tarsus	1.5	1.7	1.4	1.8	1.5
Total	18.6	20.2	17.6	21.8	4.7

Leg formula, 4213. First leg 4 times as long, first femur 1.16 times as long, as carapace.

Epigynum (pl. 8, fig. 11) similar to that of *laeta*, but basal portion of seminal receptacle rounded or subtriangular. Without lateral angle or finger.

MALE FROM AMBO, PERU: Total length, 8.5 mm. Carapace 4.5 mm. long, 3.6 mm. wide.

	I	II	III	IV	Palp
Femur	6.5	7.2	6.2	7.0	3.0
Patella	1.6	1.6	1.6	1.6	0.8
Tibia	7.0	8.1	5.7	7.1	2.0
Metatarsus	7.7	9.0	7.0	8.8	—
Tarsus	2.3	2.3	1.7	2.0	0.5
Total	25.1	28.2	22.2	26.5	6.3

Leg formula, 2413. First leg 5.7 times as long, first femur 1.4 times as long, as carapace. Metatarsi of all legs essentially straight; fourth metatarsus slightly flexible.

Male palpus (pl. 8, figs. 7, 8) shorter and proportionately thicker than that of *laeta*. Femur about six times as long as broad, four-sevenths as wide as tibia. Patella less than half as long as tibia. Tibia not fully three times as long as broad (20/7), about as deep as dorsal breadth. Tarsus subovate. Bulb suboval, equal to tarsus in size. Embolus quite thin, evenly curved, about two and one-half times as long as height of bulb.

TYPE DATA: Male holotype from Ambo, near Huánuco, Peru, 2100 meters (W. Weyrauch).

DISTRIBUTION: Peru.

RECORDS: *Peru*: Ambo, near Huánuco, 2100 meters (W. Weyrauch), males, females. Huánuco, March, 1940 (W. Weyrauch), female, immature. Tarma, 3800 meters, December 20, 1942 (W. Weyrauch), males, females; November, 1942 (W. Weyrauch), female. Canta, Rio Chillon, 2800 meters, May 12, 1951 (W. Weyrauch), females, immature.

***Loxosceles conococha*, new species**

Plate 8, figures 9, 10

DIAGNOSIS: This dark species of the *laeta* complex is most closely allied to *weyrauchi*. The male palpus is of quite similar design, but the tibia is much thicker and the embolus proportionately shorter. The legs of both sexes are clearly shorter, as indicated by the measurements and comparisons given below.

Coloration in both sexes rusty brown; hairs and setae blackish. Structure like that of *laeta* except as follows: Clypeus narrower, in both sexes only about as wide as two full diameters of median eye. Eyes moderately recurved; line along front edges of lateral eyes

nearly touching median eyes; median eye separated from lateral by scarcely more than full diameter of former.

FEMALE FROM LAKE CONOCOCHA, PERU: Total length, 10 mm. Carapace 4.5 mm. long, 3.5 mm. wide.

	I	II	III	IV	Palp
Femur	4.3	4.5	4.1	5.1	1.5
Patella	1.3	1.3	1.3	1.4	0.6
Tibia	4.1	4.3	3.4	4.7	1.1
Metatarsus	4.2	4.5	4.2	5.6	—
Tarsus	1.5	1.5	1.3	1.7	1.6
Total	15.4	16.1	14.3	18.5	4.8

Leg formula, 4213. First leg 3.4 times as long, first femur 1.0 times as long, as carapace.

Epigynum of obviously mature specimen removed and now lost.

MALE FROM LAKE CONOCOCHA, PERU: Total length, 10.5 mm. Carapace 5.3 mm. long, 4.3 mm. wide.

	I	II	III	IV	Palp
Femur	6.6	7.4	6.2	7.0	3.2
Patella	1.8	1.8	1.7	1.7	1.1
Tibia	6.6	7.6	5.3	6.6	2.1
Metatarsus	7.7	8.8	6.6	8.2	—
Tarsus	2.4	2.6	1.7	2.0	0.6
Total	25.1	28.2	21.5	25.5	7.0

Leg formula, 2413. First leg 4.7 times as long, first femur 1.2 times as long, as carapace. Metatarsi essentially straight; fourth metatarsus weakly sclerotized to allow some flexibility.

Male palpus (pl. 8, figs. 9, 10) like that of *weyrauchi*, but most segments proportionately stouter. Femur six times as long as dorsal or lateral width. Patella twice as long as broad above, thickened ventrally. Tibia considerably thickened, about two and one-half times as long as broad, in dorsal or lateral aspect. Tarsus subovate. Bulb oval, equal to tarsus in size. Embolus apically quite thin, evenly curved, about twice as long as height of bulb.

TYPE DATA: Male holotype and female

from Lake Conococha, south of Huarás, Ancash, Peru, 4300 meters (W. Weyrauch).

Loxosceles julia, new species

Plate 7, figure 11

DIAGNOSIS: This dark species of the *laeta* complex most closely resembles *conococha* in important features. The legs are slightly longer, and the first femur equals the carapace in length. It is readily separated from all other females of this group by details of the epigynum, as follows: the basal fovea is a transverse pouch as broad as the length of the thick, tubular seminal receptacle.

Carapace dark reddish brown, without contrasting markings. Structure like that of *conococha*, except as follows: clypeus broad, equal to three full diameters of median eye. Eyes small, moderately recurved; line along front edges of lateral eyes separated from median eyes by one-third of diameter of latter; median eyes separated from lateral eyes by nearly two diameters.

FEMALE FROM SAN MATEO, PERU: Total length, 10.6 mm. Carapace 5.75 mm. long, 4.7 mm. wide.

	I	II	III	IV	Palp
Femur	5.8	6.5	6.0	7.0	2.0
Patella	2.0	2.0	1.9	1.9	0.8
Tibia	6.1	6.5	5.1	6.5	1.4
Metatarsus	6.0	6.5	5.8	7.7	—
Tarsus	2.0	2.0	1.7	2.0	2.0
Total	21.9	23.5	20.5	25.1	6.2

Leg formula, 4213. First leg 3.8 times as long, first femur as long, as carapace.

Epigynum (pl. 7, fig. 11) similar to that of *laeta*, but basal foveae very broad, rectangular, as broad as length of tubular seminal receptacle.

TYPE DATA: Female type from San Mateo, Lima, Peru, 3000 meters, January 7, 1939 (W. Weyrauch).

Loxosceles herreri, new species

Plate 8, figures 1-3

DIAGNOSIS: This is another relative of *Loxosceles laeta* in which the female has the typical leg formula 4213, but the male has the

second leg very much longer than the fourth in the formula 2413. The features of the genitalia readily separate *herrerii* from all species of the group as follows: the dark brown palpus has the tibia longer and obviously thinner, as seen in side view, and the embolus is considerably longer; the epigynum presents a pair of thin tubules similar to those of *laeta*, but the broad basal receptacle bears a small, finger-like projection on the outer side.

Coloration distinctly brighter than that of typical *laeta*. Carapace of females yellow to orange or reddish brown; pars cephalica reddish brown; pars thoracica with dusky triangular patches on side margins, leaving more or less distinct pattern of yellow spots above. Carapace of male paler, but pars cephalica deep reddish brown. Legs of females yellow to orange-brown, with red patch at base of first and second femora. Distal segments of first and second legs of males dark reddish brown, but paler femora with reddish patch at base. Terminal segments of male palpus bright reddish brown.

Structure like that of *laeta* except as follows: Female: Clypeus equal in height to two and one-half diameters of median eye; median eyes separated from lateral eyes by 1.3 diameters of former; recurvature of eyes moderate, with line along front edges of anterior lateral eyes cutting behind median eyes a distance equal to their radius.

FEMALE FROM HUANCAYO, PERU: Total length, 10.7 mm. Carapace 5 mm. long, 4.6 mm. wide.

	I	II	III	IV	Palp
Femur	6.5	7.0	6.3	7.5	1.8
Patella	1.8	1.8	1.8	1.8	0.7
Tibia	6.6	6.8	5.5	6.7	1.4
Metatarsus	6.0	6.7	6.0	7.7	—
Tarsus	1.7	1.9	1.6	2.0	1.7
Total	22.6	24.2	21.2	25.7	5.6

Leg formula, 4213. First leg 4.5 times as long, first femur 1.3 times as long, as carapace.

Epigynum (pl. 8, fig. 3) similar to that of *laeta* and relatives. Basal fovea a broad transverse pouch half as wide as length of long receptacle, produced on outer side into small, blind, tubular sac.

MALE FROM HUANCAYO, PERU: Total length, 10 mm. Carapace 5.3 mm. long, 4.5 mm. wide.

	I	II	III	IV	Palp
Femur	8.0	9.0	7.7	8.7	4.1
Patella	2.0	2.0	2.0	2.0	1.3
Tibia	9.0	10.3	7.3	8.4	2.7
Metatarsus	9.3	10.8	8.8	10.7	—
Tarsus	2.6	2.5	1.8	2.3	0.6
Total	30.9	34.6	27.6	32.1	8.7

Leg formula, 2413. First leg 5.8 times as long, first femur 1.5 times as long, as carapace. First metatarsus long, thin, curved essentially like that of *laeta*.

Male palpus (pl. 8, figs. 1, 2) like that of *laeta* except as follows: Femur eight times as long as dorsal or lateral width. Patella quite thick, twice as long as broad in lateral view, not fully half as long as tibia. Tibia about three and one-half times as long as breadth. Tarsus subovate. Bulb about equal to tarsus in size, suboval, with long, curved embolus twice as long as height of bulb.

TYPE DATA: Male holotype and male and three females from Huancayo, Junin, Peru, November 18, 1962 (N. Galanza), in holes in stone walls.

Loxosceles blancasi, new species

Plate 7, figure 7

DIAGNOSIS: This near relative of *laeta* is smaller, and somewhat darker in coloration. The receptacles of the epigynum are long, thin tubes as in that species, but the narrow basal pouches are not produced on the outer side into distinct angles or conical fingers.

Coloration and structure like those of *laeta* and relatives. Carapace orange-brown; pars cephalica suffused with dusky; pars thoracica with faint dusky shadings on sides. Clypeus equal in width to two and one-half diameters of median eye. Eyes of medium size and recurvature moderate; line along front edges of lateral eyes nearly touching posterior edges of median eyes; median eye separated from lateral by one and one-third diameters of former.

FEMALE FROM ACOLLA, PERU: Total length,

8.5 mm. Carapace 4 mm. long, 3.3 mm. wide.

	I	II	III	IV	Palp
Femur	4.2	4.5	4.1	4.7	1.0
Patella	1.2	1.3	1.3	1.3	0.6
Tibia	4.0	4.2	3.3	4.3	0.8
Metatarsus	3.8	4.2	3.7	5.2	—
Tarsus	1.3	1.4	1.3	1.5	2.2
Total	14.5	15.6	13.7	17.0	4.6

Leg formula, 4213. First leg 3.6 times as long, first femur 1.05 times as long, as carapace.

Epigynum as shown in plate 7, figure 7.

TYPE DATA: Female holotype and penultimate male from Acolla, near Jauja, Junin, Peru, 3460 meters, March 7, 1955 (Dr. F. Blancas), from under cow chips and in stone walls.

OTHER RECORDS: *Peru*: Junin: Huancayo, November 18, 1962 (N. Galanza), female and immature in stone piles.

***Loxosceles surca*, new species**

Plate 8, figures 4, 6, 12

DIAGNOSIS: This small species has the leg formula 4213 as in *laeta* and relatives. The legs are proportionately shorter than in all species except *conococha* and *julia*, and the first femur only equals the carapace in length. The epigynum is similar to that of *laeta* and relatives but differs in size and various details as shown.

Coloration and structure essentially like those of *laeta*, *accepta*, and other species. Carapace (pl. 8, fig. 12) dusky yellowish brown, with pars cephalica all brown, dusky patches margining the pars thoracica, and typical pattern of impressed lines on pars cephalica. Clypeus equal in height to two full diameters of median eye. Eyes of medium size and moderately recurved; line along front edges of lateral eye falling behind posterior edges of median eyes by one-third of diameter in holotype, touching in other specimens; median eyes separated from lateral by full diameter in holotype, by shorter diameter in other specimens.

FEMALE FROM SURCO, PERU: Total length, 6.5 mm. Carapace 3.2 mm. long, 2.7 mm. wide.

	I	II	III	IV	Palp
Femur	3.2	3.3	3.1	4.0	1.1
Patella	1.0	1.0	1.0	1.1	0.5
Tibia	3.0	3.1	2.6	3.7	0.8
Metatarsus	3.0	3.2	3.0	4.5	—
Tarsus	1.3	1.3	1.1	1.3	1.1
Total	11.6	11.9	10.8	14.6	3.5

Leg formula, 4213. First leg 3.3 times as long, first femur as long, as carapace.

Epigynum (pl. 6, figs. 4, 6) presenting two quite widely separated, tubular, seminal receptacles similar in design to those of *laeta* and *weyrauchi* but differing in details as shown.

TYPE DATA: Female holotype and female from Surco, Rimac Valley, 2000 meters, Lima, Peru, October 9, 1963 (A. Herrero, P. Wygodzinsky).

OTHER RECORD: *Peru*: Lima: Vicinity of Santa Eulalia, near Chosica, 1250 meters, March 6, 1953, one damaged female, in the Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt.

***Loxosceles olmea*, new species**

Plate 7, figure 6

DIAGNOSIS: This species has the leg formula of the *laeta* series, 4213, but it otherwise more closely resembles *accepta* and relatives. The seminal receptacles are thin fingers quite distinct in form from those of any other species.

Coloration and structure essentially like those of *accepta*. Clypeus of median breadth, slightly exceeding two full diameters of median eye. Eyes quite strongly recurved; line along front edges of lateral eyes falling behind median by their radius; median eye separated from lateral by one and one-half diameters.

FEMALE FROM OLMOS, PERU: Total length, 7.5 mm. Carapace 3.3 mm. long, 2.7 mm. wide.

	I	II	III	IV	Palp
Femur	3.8	4.1	3.7	4.2	1.1
Patella	1.0	1.0	1.0	1.0	0.5
Tibia	3.8	4.0	3.1	3.8	0.8
Metatarsus	3.5	3.8	3.3	4.1	—
Tarsus	1.3	1.2	1.1	1.2	1.1
Total	13.4	14.1	12.2	14.3	3.5

Leg formula, 4213. First leg 4.0 times as long, first femur 1.1 times as long, as carapace.

Epigynum (pl. 7, fig. 6) presenting two thin tubular pouches well separated at base and without enlargement at apex.

TYPE DATA: Female holotype from 21 miles east of Olmos, Lambayeque, January 18, 1955 (E. S. Ross, E. I. Schlinger), in the California Academy of Sciences.

***Loxosceles pucara*, new species**

Plate 10, figure 16

DIAGNOSIS: This small species has the typical leg formula, 4213, of the *laeta* group. The seminal receptacles of the epigynum are quite widely separated pouches bearing irregular lobes distinct from those of all other species.

Coloration and structure like those of *laeta* and relatives. Carapace quite uniform orange-brown, with pattern of impressed lines and bars well marked. Recurvature of eyes about as in *laeta*; line along front edges of lateral eyes falling behind median eyes by one-third of their diameter; median eyes separated from lateral eyes by slightly more than full diameter of former. Clypeus as broad as about two and one-half diameters of median eye.

FEMALE FROM PUCARA, PERU: Total length, 7.5 mm. Carapace 3.2 mm. long, 2.75 mm. wide.

	I	II	III	IV	Palp
Femur	3.8	4.1	3.8	4.2	1.1
Patella	1.1	1.1	1.1	1.1	0.4
Tibia	3.8	4.1	3.2	4.0	0.7
Metatarsus	3.7	4.2	3.7	4.6	—
Tarsus	1.2	1.2	1.0	1.2	1.1
Total	13.6	14.7	12.8	15.1	3.3

Leg formula, 4213. First leg 4.2 times as long, first femur 1.2 as long, as carapace.

Epigynum as shown in plate 10, figure 16.

TYPE DATA: Female holotype from Rio Huancabamba, Pucara, Puno, Peru, 860 meters (W. Weyrauch).

***Loxosceles coquimbo*, new species**

Plate 8, figure 5

DIAGNOSIS: This distinct species, known from a single female from central Chile, has

the leg formula of *laeta* and near relatives (4213) but otherwise seems more closely allied to *lutea* and *accepta*. The tibia and tarsus of the female palpus are thickened as in *lutea*. The epigynum presents a shallow transverse atrium which gives rise on each side to a pair of tubular receptacles.

Coloration and structure like those of *lutea* and *accepta*. Carapace dusky yellow, without obvious darker pattern. Tibia and tarsus of female palpus dark reddish brown, stout as in *lutea*; tibia 2.4 times as long as broad; tarsus four times as long as broad, nearly as broad as tibia, tapered to a blunt point. Eyes subequal in size and with moderate recurvature; line along front edges of lateral eyes falling behind median eyes one-half of their diameter; median eye separated from lateral by one and one-half diameters. Clypeus slightly exceeding in breadth two full diameters of median eye.

FEMALE FROM PLAYA BLANCA, CHILE: Total length, 7.5 mm. Carapace 3.3 mm. long, 2.6 mm. wide.

	I	II	III	IV	Palp
Femur	4.1	4.3	3.2	4.6	1.1
Patella	1.1	1.1	1.1	1.1	0.5
Tibia	4.0	4.2	3.2	4.4	0.8
Metatarsus	4.0	4.1	4.2	5.1	—
Tarsus	1.3	1.4	1.1	1.4	1.3
Total	14.5	15.1	12.8	16.6	3.7

Leg formula, 4213. First leg 4.4 times as long, first femur 1.24 times as long, as carapace.

Epigynum as shown in plate 8, figure 5.

TYPE DATA: Female holotype from Playa Blanca, Coquimbo Province, Chile, October, 1961 (H. J. McMillin).

***Loxosceles accepta* Chamberlin**

Plate 9, figures 1, 2, 7, 8

Loxosceles rufescens: CHAMBERLIN, 1916, p. 213.

Loxosceles accepta CHAMBERLIN, 1920, p. 39, pl. 4, figs. 4, 5. ROEWER, 1942 (1942-1954, vol. 1), p. 320 (*Loxoscelis*). BONNET, 1957 (1945-1957, vol. 2, pt. 3), p. 2573. BÜCHERL, 1961, p. 219.

DIAGNOSIS: This very distinct species is readily identified by features of the male and female genitalia as shown in the illustrations. The shape of the bulb and embolus of the

male palpus is diagnostic by itself. The species has quite long legs in both sexes, and the metatarsi of the male are somewhat flexible.

Coloration and structure essentially like those of *laeta* and relatives. Clypeus broad, equal to about three full diameters in female. Eyes quite strongly recurved; line along front edges of lateral eyes falling behind median by distance equal to their radius; median eye separated from lateral by one and one-third diameters of former or even more in some specimens. Eyes of male only slightly closer together than those of female.

FEMALE PARATYPE FROM HUADQUINA, PERU: Total length, 9 mm. Carapace 4.2 mm. long, 3.6 mm. wide.

	I	II	III	IV	Palp
Femur	6.0	6.3	5.5	6.4	2.0
Patella	1.4	1.4	1.4	1.4	0.5
Tibia	6.4	6.7	4.9	6.3	1.1
Metatarsus	6.1	6.8	5.5	6.9	—
Tarsus	1.7	1.7	1.5	1.6	1.5
Total	21.6	22.9	18.8	22.6	5.1

Leg formula, 2413. First leg 5.1 times as long, first femur 1.4 times as long, as carapace.

Epigynum (pl. 9, fig. 7) presenting two subtriangular receptacles broad at base and nearly touching on midline, each of which is produced on outside into lateral finger.

MALE HOLOTYPE FROM HUADQUINA, PERU: Total length, 8.5 mm. Carapace 4 mm. long, 3.7 mm. wide.

	I	II	III	IV	Palp
Femur	8.0	9.0	7.2	9.0	2.5
Patella	1.6	1.6	1.5	1.6	0.7
Tibia	9.3	10.7	6.8	9.4	1.7
Metatarsus	9.7	11.0	7.7	9.4	—
Tarsus	2.1	2.2	1.6	1.7	0.5
Total	30.7	34.5	24.8	31.1	5.4

Leg formula, 2413. First leg 7.5 times as long, first femur 2 times as long, as carapace. First and fourth metatarsi very long and thin, marked with false sutures in apical third to allow flexibility but segment essentially straight.

Male palpus (pl. 9, figs. 1, 2) of medium length and robustness. Femur about six

times as long as wide, as seen from above or on side. Patella nearly two-thirds as broad as long, not fully half as long as tibia. Tibia about twice as long as greatest dorsal width and about as deep as wide. Patella slightly longer than broad. Bulb subspherical, with long, flattened embolus quite broad at base and twice as long as bulbal portion.

TYPE DATA: Male type and numerous paratypes from Huadquina, Peru, 5000 feet, July, 1911, in the Museum of Comparative Zoology.

DISTRIBUTION: Peru.

NEW RECORD: Quillabamba (Valle Urubamba), Peru, 1100 meters, December, 1947 (W. Weyrauch), female, immature.

Loxosceles bettyae, new species

Plate 9, figures 9–12

DIAGNOSIS: This distinctive species is readily separated from *accepta* and relatives by striking genitalic differences. The patella of the male palpus is longer and stouter than usual and equals nearly two-thirds of the tibial length. The embolus is quite long and the bulb rather small, as in *accepta*. The leg formula in both sexes is 2413, with the first and fourth legs equal.

Coloration and structure essentially like those of *accepta* and other species of this series. Carapace with indistinct dusky patches on margins of pars thoracica and with pattern of impressed lines and bars on pars cephalica well marked. Recurvature of eyes about as in *laeta*; line along front edges of lateral eyes falling behind median eyes by one-half of their diameter; median eye separated from lateral by one and two-thirds diameters. Clypeus as broad as two and one-half diameters of median eye. In males eyes closer together and clypeus narrower, not fully as wide as two diameters of median eye.

FEMALE FROM EKIN, PERU: Total length, 8.7 mm. Carapace 3.8 mm. long, 3.1 mm. wide.

	I	II	III	IV	Palp
Femur	4.4	4.7	4.0	4.3	1.3
Patella	1.2	1.2	1.2	1.2	0.5
Tibia	4.5	4.8	3.5	4.2	0.8
Metatarsus	4.5	5.1	4.2	5.0	—
Tarsus	1.4	1.4	1.2	1.3	1.2
Total	16.0	17.2	14.1	16.0	3.8

Leg formula, $2\overline{4}1\overline{3}$; first and fourth legs equal. First leg 4.2 times as long, first femur 1.1 times as long, as carapace.

Epigynum as shown in plate 9, figure 10.

MALE FROM EKin, PERU: Total length, 6.8 mm. Carapace 3.2 mm. long, 2.8 mm. wide.

	I	II	III	IV	Palp
Femur	5.0	6.0	4.5	5.2	2.2
Patella	1.2	1.2	1.2	1.2	0.8
Tibia	5.5	6.1	4.2	5.0	1.2
Metatarsus	5.5	6.9	4.8	6.0	—
Tarsus	1.7	1.7	1.2	1.5	0.5
Total	18.9	22.4	15.9	18.9	4.7

Leg formula, $2\overline{4}1\overline{3}$; first and fourth legs equal. First leg 5.9 times as long, first femur 1.5 times as long, as carapace. All metatarsi essentially straight.

Palpus (pl. 9, figs. 9, 11, 12) of typical length, but patella quite long and stout. Femur seven and one-half times as long as dorsal or lateral width. Patella thick, longer than in other species, equal to about two-thirds of length of tibia. Tibia twice as long as broad above, as deep as dorsal breadth, narrowed sharply at junction with patella. Tarsus subovate. Bulb about equal to tarsus in size, suboval, with long, curved embolus more than twice as long as height of bulb.

TYPE DATA: Male holotype and several males and females from Ekin, east of Tarpoto, San Martin, Peru, March 9–21, 1947 (F. Woytkowski).

DISTRIBUTION: Peru; known only from type locality.

***Loxosceles gloria*, new species**

Plate 9, figures 3–6

DIAGNOSIS: This species most closely approaches *accepta* in palpal characters. All segments are somewhat stouter, and the tibia is much broader in proportion to the length. Similarly the bulb is larger and bears a shorter embolus. The epigynum most closely resembles that of *bettyae* but is readily distinguished by the proportions of the seminal receptacles as shown in the illustrations. The legs are shorter than those of *accepta* but have the same formula, 2413.

Coloration and structure essentially like those of *accepta* and related species. Carapace dusky to bright reddish brown, without darker contrasting markings except for darkened pars cephalica. Eye recurvature medium; line along front edges of lateral eyes falling behind median one-fourth of their diameter; median eyes separated from lateral by one and one-third diameters. Clypeus slightly exceeding in width two diameters of median eye. Eyes of male like those of female, but clypeus narrower.

FEMALE FROM GUAYAQUIL, ECUADOR: Total length, 8.4 mm. Carapace 3.8 mm. long, 3.2 mm. wide.

	I	II	III	IV	Palp
Femur	4.8	5.5	4.5	5.0	1.3
Patella	1.3	1.3	1.3	1.3	0.5
Tibia	5.1	5.5	3.9	4.7	0.9
Metatarsus	5.2	5.7	4.7	5.6	—
Tarsus	1.4	1.4	1.3	1.3	2.3
Total	17.8	19.4	15.7	17.9	5.0

Leg formula, 2413. First leg 4.7 times as long, first femur 1.2 times as long, as carapace.

Epigynum (pl. 9, fig. 6) presenting two wide, subtriangular, seminal receptacles, separated by half of width of one at base, each with apex forming small rounded finger.

MALE FROM GUAYAQUIL, ECUADOR: Total length, 6 mm. Carapace 3.3 mm. long, 2.8 mm. wide.

	I	II	III	IV	Palp
Femur	5.3	6.3	5.2	5.7	2.2
Patella	1.2	1.2	1.2	1.2	0.7
Tibia	5.8	6.9	4.7	5.5	1.3
Metatarsus	5.3	7.4	5.6	6.7	—
Tarsus	1.6	1.7	1.3	1.4	0.4
Total	19.2	23.5	18.0	20.5	4.6

Leg formula, 2413. First leg 5.8 times as long, first femur 1.6 times as long, as carapace. All metatarsi essentially straight.

Palpus (pl. 9, figs. 4, 5) medium in length and stoutness. Femur seven times as long as dorsal width. Patella quite stout, three-

fifths as broad as long, five-ninths as long as tibia. Tibia stout, twice as long as broad in dorsal or lateral view. Tarsus subovate, nearly as broad as long. Bulb somewhat larger than tarsus. Embolus quite heavy, curved, slightly angled, about one and one-half times as long as height of bulb.

TYPE DATA: Male holotype from west of Guayaquil, Ecuador, 1940–1941 (R. W. Landis).

RECORDS: *Ecuador*: West of Guayaquil, 1940–1941 (R. W. Landis), two females. Baños de San Vicente, April, 1940 (R. W. Landis), male. Ten miles north of Manglar Alto, Guayas, January 30, 1955, male, immature. *Peru*: Piura: On "tablazo" between Quebrada Pariñas and Salado, December, 1938 (H. E. and D. L. Frizzell), two females, immature. Quebrada del Muerto, January 1, 1939 (H. E. and D. L. Frizzell), two females. Quebrada Mogollon, June 11, 1939 (H. E. and D. L. Frizzell), male, three females, immature.

***Loxosceles piura*, new species**

Plate 7, figure 12

DIAGNOSIS: This species closely resembles *gloria* in the details of the genitalia of both sexes but is readily distinguished by the following features: The legs are shorter in both sexes, as shown in the measurements. The leg formula of the female is 4213, instead of 2413, and the first and fourth tibiae are subequal in length. The leg formula of the male is 2413, but the first metatarsus is only slightly curved instead of being considerably curved.

Coloration and structure essentially like those of *accepta* and *gloria*. Carapace dusky to bright orange or reddish brown, without contrasting markings. Eyes of female of average size and eye recurvature moderate; line along front edges of lateral eyes falling behind median eyes by their radius; median eyes separated from lateral eyes by one and one-half diameters. Clypeus equal in width to two and one-half diameters of median eyes. Eyes of male closer together and clypeus narrower.

FEMALE FROM QUEBRADA MOGOLLON, PERU: Total length, 7.3 mm. Carapace 3.3 mm. long, 2.7 mm. wide.

	I	II	III	IV	Palp
Femur	3.7	3.8	3.5	3.9	1.1
Patella	1.0	1.0	1.0	1.0	0.5
Tibia	3.5	3.7	2.8	3.6	0.7
Metatarsus	3.5	3.8	3.4	4.3	—
Tarsus	1.2	1.2	1.0	1.2	1.0
Total	12.9	13.5	11.7	14.0	3.3

Leg formula, 4213. First leg 3.9 times as long, first femur 1.1 times as long, as carapace.

Epigynum (pl. 7, fig. 12) similar to that of *gloria*, but receptacles proportionately larger and with shorter apical lobe.

MALE FROM QUEBRADA MOGOLLON, PERU: Total length, 6.3 mm. Carapace 3.1 mm. long, 2.7 mm. wide.

	I	II	III	IV	Palp
Femur	4.5	5.2	4.7	5.2	2.0
Patella	1.2	1.2	1.0	1.1	0.8
Tibia	4.8	5.3	4.0	4.8	1.1
Metatarsus	4.8	6.1	5.7	6.3	—
Tarsus	1.5	1.7	1.3	1.5	0.5
Total	16.8	19.5	16.7	18.9	4.4

Leg formula, 2413. First leg 5.4 times as long, first femur 1.4 times as long, as carapace. First metatarsus with slight curvature.

Male palpus rather short and stout. Femur six times as long as dorsal width. Patella twice as long as dorsal width, two-thirds as long as tibia. Tibia stout, twice as long as broad above. Tarsus subovate, about as long as broad. Bulb somewhat larger than tarsus, with heavy, curved embolus one and one-half times as long as height of bulb.

TYPE DATA: Male holotype from Quebrada Mogollon, Piura, Peru, June 11, 1939 (H. E. and D. L. Frizzell).

OTHER RECORDS: *Peru*: Piura: On "tablazo" between Quebrada Pariñas and Salado, December, 1938, two females, immature. Quebrada del Muerto, January 1, 1939, two females. Quebrada Mogollon, June 11, 1939, three females, immature. Twelve meters north of Mancora, December 11, 1935, four females, immature. All above collected by H. E. and D. L. Frizzell.

***Loxosceles rosana*, new species**

Plate 10, figure 10

DIAGNOSIS: This large species resembles *laeta* in general appearance and has the typical leg formula, 4213. It is readily distinguished from that species by the proportionately longer legs, the smaller and more widely separated eyes, and the quite different epigynum. In the proportions of the epigynum *rosana* resembles *gloria*, but this latter species has the leg formula 2413.

Coloration and structure essentially like those of *laeta*. Carapace quite uniform, bright orange-brown, with indistinct, dusky shadings. Eyes small, arranged in strongly recurved row; line along front edges of lateral eyes falling behind median eyes by distance equaling their radius; median eyes separated from lateral eyes by nearly two diameters. Clypeus nearly equaling in width three full diameters of median eyes.

FEMALE FROM RIO CHUSGON, PERU: Total length, 11.5 mm. Carapace 5.2 mm. long, 4.1 mm. wide.

	I	II	III	IV	Palp
Femur	6.9	7.4	6.8	7.6	1.8
Patella	1.7	1.7	1.7	1.7	0.7
Tibia	7.0	7.5	5.7	7.0	1.3
Metatarsus	6.7	7.5	6.6	8.5	—
Tarsus	1.6	1.7	1.5	1.8	1.7
Total	23.9	25.8	22.3	26.3	5.5

Leg formula, 4213. First leg, 4.6 times as long, first tibia 1.3 times as long, as carapace.

Epigynum (pl. 10, fig. 10) presenting two broad, subtriangular, seminal receptacles, narrowly separated at base, with apex of each produced into prominent tubular projection.

TYPE DATA: Female holotype and three immature specimens from Hacienda Santa Rosa, Rio Chusgon, 190 kilometers northeast of Trujillo, Peru, 1800 meters, November 21, 1955 (W. Weyrauch).

OTHER RECORD: *Peru*: Hacienda Santa Elena, Rio Chusgon, 1500 meters, November 22, 1955 (W. Weyrauch), penultimate male, two immature females.

***Loxosceles frizzelli*, new species**

Plate 10, figures 12-14

DIAGNOSIS: The presence of a comb of four or five enlarged setae on the tarsus of the

male palpus readily separates this species from any other of the *laeta* group. The patella and tibia of the palpi are short and quite thick. The shape of the seminal receptacles of the epigynum is diagnostic for females. The legs are about the same length as those of *bettyae* but distinctly shorter than those of *accepta*.

Coloration and structure in good agreement with those of *laeta* and *accepta*. Eyes of female in moderately recurved row; line along front edges of lateral eyes falling behind median eyes by only one-fourth of their diameter; median eyes separated from lateral by 1.3 diameters. Clypeus equal in width to two full diameters of median eye. Eye relations of male essentially same as those of female.

FEMALE FROM SANTA ROSA, PERU: Total length, 7.8 mm. Carapace 3.8 mm. long, 3.2 mm. wide.

	I	II	III	IV	Palp
Femur	4.5	4.8	4.2	4.9	1.3
Patella	1.2	1.2	1.2	1.2	0.5
Tibia	4.6	5.0	3.7	4.5	1.0
Metatarsus	4.6	4.8	4.2	5.1	—
Tarsus	1.4	1.4	1.2	1.3	1.3
Total	16.3	17.2	14.5	17.0	4.1

Leg formula, 2413. First leg 4.3 times as long, first femur 1.2 times as long, as carapace.

Epigynum (pl. 10, fig. 13) presenting two pouches, separated by their basal width, which are rounded and slightly enlarged apically.

MALE FROM SANTA ROSA, PERU: Total length, 8 mm. Carapace 3.6 mm. long, 3 mm. wide.

	I	II	III	IV	Palp
Femur	5.9	7.0	5.5	6.1	2.0
Patella	1.2	1.2	1.2	1.2	0.7
Tibia	6.5	7.9	5.3	6.2	1.3
Metatarsus	6.7	8.2	6.2	7.1	—
Tarsus	1.8	1.8	1.3	1.5	0.4
Total	22.1	26.1	19.5	22.1	4.4

Leg formula, 2143; first and fourth legs equal. First leg 6.1 times as long, first femur 1.6 times as long, as carapace. All metatarsi straight.

Male palpus (pl. 10, figs. 12, 14) of medium length and stoutness. Femur somewhat more than five times as long as dorsal or lateral width. Patella three-fifths as broad as long, about half as long as tibia. Tibia quite thick, about twice as long as broad above and in lateral view. Tarsus subovate, armed on pro-lateral surface with marginal comb of five enlarged setae nearly as long as embolus. Bulb suboval, as large as tarsus. Embolus evenly curved, about twice as long as height of bulb.

TYPE DATA: Male holotype and female from Santa Rosa, near River Chinchipe, Cajamarca, Peru, 1600 meters, July 27, 1948 (W. Weyrauch).

DISTRIBUTION: Peru; known only from above specimens.

***Loxosceles alicea*, new species**

Plate 10, figure 11

DIAGNOSIS: This species, based on a single pale, probably not fully colored, female, resembles *laeta* in general appearance but has longer legs and a leg formula of 2413. The details of the epigynum readily separate it from all known species.

Coloration and structure essentially like those of *laeta*. Carapace, abdomen, and appendages light yellowish, without darker contrasting markings, quite liberally covered with black hairs and setae. Clypeus broad, equal in width to three diameters of median eye. Eyes rather small and eye recurvature moderate; line along front edges of lateral eyes falling behind median by two-thirds of their diameter; median eye separated from lateral by 1.5 diameters.

FEMALE FROM CARPISH, PERU: Total length, 11 mm. Carapace 7 mm. long, 4 mm. wide.

	I	II	III	IV	Palp
Femur	7.6	8.5	7.0	8.0	2.3
Patella	1.7	1.7	1.7	1.7	0.8
Tibia	8.5	9.1	6.6	7.8	1.7
Metatarsus	7.9	9.0	7.4	9.3	—
Tarsus	2.0	2.0	1.7	2.0	2.0
Total	27.7	30.3	24.4	28.8	6.8

Leg formula, 2413. First leg 5.5 times as long, first femur 1.5 times as long, as carapace.

Epigynum (pl. 10, fig. 11) presenting two subtriangular, seminal receptacles, each produced to rounded lobe on inner side.

TYPE DATA: Female holotype from Carpish, 20 miles east of Acomayo, Huánuco, Peru, 2800 meters, October 9–12, 1945 (F. Woytkowski).

DISTRIBUTION: Peru; known only from female above.

***Loxosceles harrietae*, new species**

Plate 7, figure 10

DIAGNOSIS: This species resembles *accepta* in general features but is readily separable by the distinctive epigynum.

Coloration and structure like those of *accepta* and relatives. Carapace quite uniform orange-brown, somewhat darker on sides, with impressed lines and markings inconspicuous. Clypeus quite broad, equal to three diameters of median eye. Eyes small, quite strongly recurved; line along front edges of lateral eyes falling behind median eyes by distance equaling two-thirds of their diameter; median eye separated from lateral by about two diameters of former.

FEMALE FROM HIGUERON, PERU: Total length, 10.4 mm. Carapace 4.7 mm. long, 3.8 mm. wide.

	I	II	III	IV	Palp
Femur	6.5	7.0	6.0	6.5	1.6
Patella	1.5	1.6	1.5	1.6	0.7
Tibia	6.6	7.0	4.9	6.2	1.2
Metatarsus	6.5	7.2	6.0	7.2	—
Tarsus	1.7	1.7	1.5	1.5	1.6
Total	22.8	24.5	19.9	23.0	5.1

Leg formula, 2413. First leg 4.8 times as long, first femur 1.38 times as long, as carapace.

Epigynum (pl. 7, fig. 10) presenting two large pouches, each with small angle on outer side and finger-like projection.

TYPE LOCALITY: Female holotype from Higueron (Las Lomas), Peru, July 29, 1941 (H. E. and D. L. Frizzell).

***Loxosceles inca*, new species**

Plate 6, figure 10; plate 10, figure 4; plate 11, figures 11–13

DIAGNOSIS: This long-legged species is readily separated from *accepta* and relatives

by genitalic differences. The palpus of the male is quite long and thin and the segments are only slightly incrassated. The tibia is proportionately somewhat thicker than that of *taeniopalpis*, but in other palpal details there is good resemblance. The female is best separated by details of the epigynum, as illustrated. The leg formula of both sexes is 2143, but the leg lengths are proportionately greater than in all species of this series but *accepta*.

Coloration and structure essentially like those of *accepta* and relatives. Carapace yellowish to orange-brown; pars thoracica with dusky radiating lines from median groove to side margins, which have indistinct dusky patches; pars cephalica dusky orange-brown, with pattern of impressed lines well marked. Palpus of female quite long, with tibia and tarsus bright reddish brown, thickened, and tarsus nearly as thick as tibia. Eyes of female in well-recurved row; line along front margins of lateral eyes cutting behind median eyes, distance equal to their radius; median eye separated from lateral by almost one and one-half diameters. Clypeus as wide as two full diameters of median eyes. Eyes of males closer together and less recurved; median eye separated from lateral by one full diameter. Clypeus narrower in male, as broad as one and one-half diameters of median eye.

FEMALE FROM TINGO MARIA, PERU: Total length, 9 mm. Carapace 4 mm. long, 3.2 mm. wide.

	I	II	III	IV	Palp
Femur	6.8	7.5	6.3	6.5	2.0
Patella	1.4	1.4	1.4	1.4	0.7
Tibia	7.3	8.3	6.0	6.6	1.5
Metatarsus	7.6	8.7	7.0	8.3	—
Tarsus	1.8	1.8	1.5	1.7	1.8
Total	24.9	27.7	22.2	24.5	6.0

Leg formula, 2143. First leg 6.2 times as long, femur 1.7 times as long, as carapace.

Epigynum (pl. 10, fig. 4) presenting two short, rounded, seminal receptacles well separated at base.

MALE FROM TINGO MARIA, PERU: Total length, 7 mm. Carapace 3.4 mm. long, 2.7 mm. wide.

	I	II	III	IV	Palp
Femur	7.1	7.9	6.4	6.7	2.5
Patella	1.2	1.2	1.2	1.2	0.8
Tibia	7.7	9.3	6.3	6.7	1.5
Metatarsus	8.1	10.3	7.7	8.3	—
Tarsus	1.9	1.9	1.5	1.7	0.4
Total	26.0	30.6	23.1	24.6	5.2

Leg formula, 2143. First leg 7.6 times as long, first femur 2.1 times as long, as carapace. Metatarsi very long and flexible, but essentially straight, without special modification.

Palpus (pl. 11, figs. 11–13) of medium size, with all segments quite slender. Femur about eight times as long as width at apex above. Patella twice as long as broad, half as long as tibia. Tibia three times as long as broad from above or on side. Tarsus suboval. Bulb suboval, equal to tarsus in size. Embolus quite thin, curved, about twice as long as height of bulb.

TYPE DATA: Male holotype from Cueva de la Lechuza, near Tingo Maria, Peru, May 15, 1947 (J. C. Pallister).

DISTRIBUTION: Southern Peru.

RECORDS: *Peru*: Tingo Maria, April, 1940 (W. Weyrauch), female, immature; October 25, 1946 (J. C. Pallister), female, immature. Monson Valley, Tingo Maria, September 23, 1954 (E. Schlinger; E. Ross), males. Monson Cave, Tingo Maria, December 15, 1954 (E. Schlinger; E. Ross), males, females, immature. Cueva de la Lechuza, near Tingo Maria (W. Weyrauch), male, females, immature. Acomayo, 2100 meters, July, 1946 (F. Woytkowski), many males, females, immatures.

Loxosceles taeniopalpis Simon

Plate 10, figure 15; plate 11, figures 4–6

Loxosceles taeniopalpus SIMON, 1907, p. 247, fig. 1A. PETRUNKEVITCH, 1911, p. 118. CHAMBERLIN, 1920, p. 40. ROEWER, 1942 (1942–1954, vol. 1), p. 321. BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2579 (*taeniopalpis*). BÜCHERL, 1961, p. 219.

DIAGNOSIS: This species most closely resembles *Loxosceles inca*, new species, of southern Peru. It features a relatively long palpus with little incrassation of the segments and a much thinner tibia. The legs of *taeniopalpis*, with a formula of 2413, are

much shorter in both sexes than those of *inca*, in which the leg formula is 2143. The females are also readily recognized by good differences in the receptacles of the epigyna, as shown in the illustrations.

Coloration of cotypes yellowish brown. Carapace with radiating brownish lines on pars thoracica running to side margins and with impressed pattern of lines and bars on pars cephalica quite distinct. Structure like that of *inca* and other species of this group. Clypeus sloping, equal in width to two full diameters of median eyes. Eyes in both sexes as follows: front eye row quite strongly recurved; line along front edges of lateral eyes falling behind median eyes one-third of their diameter; median eyes oval, contiguous, separated from subequal lateral eyes by one and one-half diameters. Clypeus sloping, equal in width to two diameters of median eye.

FEMALE COTYPE FROM LOJA, ECUADOR: Total length, 9.2 mm. Carapace 4.2 mm. long, 3.5 mm. wide.

	I	II	III	IV	Palp
Femur	5.6	6.1	5.3	5.7	1.5
Patella	1.4	1.4	1.4	1.4	0.7
Tibia	5.8	6.2	4.5	5.5	1.2
Metatarsus	5.6	6.1	5.0	6.1	—
Tarsus	1.6	1.6	1.3	1.4	1.6
Total	20.0	21.4	17.5	20.1	4.8

Leg formula, 2413. First leg 4.7 times as long, first femur 1.3 times as long, as carapace.

Epigynum (pl. 10, fig. 15) presenting two thick, apically bilobed receptacles.

MALE FROM LOJA, ECUADOR: Total length, 7.5 mm. Carapace 3.6 mm. long, 3 mm. wide.

	I	II	III	IV	Palp
Femur	5.5	6.0	5.2	5.8	1.5
Patella	1.3	1.3	1.3	1.3	0.8
Tibia	5.5	6.5	4.5	5.5	1.6
Metatarsus	6.1	6.6	5.5	6.6	—
Tarsus	1.8	1.8	1.4	1.7	0.5
Total	20.2	22.2	17.9	20.9	4.4

Leg formula, 2413. First leg 5.6 times as

long, first femur 1.5 times as long, as carapace. All metatarsi essentially straight.

Male palpus (pl. 11, figs. 4–6) quite long.

Femur long, cylindrical, about eight times as long as greatest width near base. Tibia 0.38 mm. wide near apex, narrow at base, about twice as long as wide above and, in lateral view, considerably narrowed at base, much thinner than that of *inca*. Tarsus sub-oval, about as long as broad. Bulb equal in size to tarsus, oval in side view. Embolus thin, curved, twice as long as bulb.

TYPE DATA: Male lectotype and four female cotypes from Loja, Amajala, Ecuador (Gaujon), in the Muséum National d'Histoire Naturelle, Paris, France.

DISTRIBUTION: Southern Ecuador; known only from type lot.

Loxosceles lutea Keyserling

Plate 6, figure 11; plate 10, figures 1–3, 9

Loxosceles lutea KEYSERLING, 1877, p. 216. SIMON, 1907, p. 248. PETRUNKEVITCH, 1911, p. 118 (part). ROEWER, 1942 (1942–1954, vol. 1), p. 321 (*Loxoscelis*). BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2575. BÜCHERL, 1961, p. 219.

Loxosceles pictithorax STRAND, 1914, p. 819. ROEWER, 1942 (1942–1954, vol. 1), p. 321 (*Loxoscelis*). BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2575. BÜCHERL, 1961, p. 219.

DIAGNOSIS: This species is easily recognized by distinctive features of the genitalia. The tibia of the male palpus is much shorter and thicker, especially in the basal third, than that of any other species of the *laeta* group. The seminal receptacles of the epigynum are rounded lobes as shown in plate 10, figure 3. The leg formula is 2413 in both sexes, and the legs are quite short, in the male the first being only five times as long as the carapace. *Loxosceles lutea* shows considerable resemblance to *L. rufipes* Lucas of Central America and *L. lawrencei* Caporiacco of Venezuela but is easily distinguished by genitalic characters.

Coloration and structure similar to those of *accepta* and relatives. Carapace bright orange to reddish brown; pars thoracica with dark lines radiating from median groove and faint dusky shadings on side margins; pars cephalica with pattern of impressed lines distinct. Tibia and tarsus of female palpus dark reddish brown, stouter than usual in genus;

tarsus longer than but nearly as broad as tibia; tarsus tapered to blunt point. First and second tarsi reddish brown in immature female cotype, except apically, and apical fourth of these metatarsi reddish brown; these segments not so marked in mature specimens from near Quito, Ecuador. Eyes of female subequal in size, and recurvature moderate; line along front edges of lateral eyes falling behind median one-third of their diameter; median eye separated from lateral by one and one-half diameters. Eyes of male closer together and less recurved. Clypeus of female two full diameters of median eye in breadth, of male somewhat less.

FEMALE FROM NEAR QUITO, ECUADOR: Total length, 8 mm. Carapace 3.3 mm. long, 2.8 mm. wide.

	I	II	III	IV	Palp
Femur	3.8	4.0	3.5	4.0	1.3
Patella	1.0	1.0	1.0	1.0	0.5
Tibia	3.8	4.0	3.0	3.9	0.8
Metatarsus	3.8	4.0	3.3	4.3	—
Tarsus	1.3	1.3	1.0	1.1	1.1
Total	13.7	14.3	11.8	14.3	3.7

Leg formula, $\overline{2413}$; second and fourth legs equal. First leg 4.1 times as long, first femur 1.1 times as long, as carapace.

Epigynum (pl. 10, figs. 3, 9) presenting two quite widely separated, lobular, seminal receptacles.

MALE FROM NEAR QUITO, ECUADOR: Total length, 6.4 mm. Carapace 2.9 mm. long, 2.5 mm. wide.

	I	II	III	IV	Palp
Femur	3.8	4.3	3.5	4.1	1.5
Patella	1.0	1.0	1.0	1.0	0.6
Tibia	4.1	4.6	3.2	4.1	1.0
Metatarsus	4.1	4.7	3.5	4.4	—
Tarsus	1.3	1.3	1.0	1.2	0.4
Total	14.3	15.9	12.2	14.8	3.5

Leg formula, 2413. First leg five times as long, first femur 1.3 times as long, as carapace. All metatarsi essentially straight.

Palpus (pl. 10, figs. 1, 2) with segments quite short and stout. Femur 4.2 times as long as dorsal or ventral width. Patella three-

fifths as broad as long, about half as long as tibia. Tibia twice as long as broad and about same depth, thickest behind middle, abruptly narrowed at junction to patella. Tarsus sub-oval. Bulb about equal in size to tarsus. Embolus heavy, evenly curved, slightly more than twice as long as bulbal height, with slight curve at tip.

TYPE DATA: Of *Loxosceles lutea* Keyserling, six females, cotypes, some not fully mature, from Santa Fé de Bogotá, Colombia, in the British Museum (Natural History); of *Loxosceles pictithorax* Strand, female type from between Honda and Guadas (600–1000 meters), Colombia.

DISTRIBUTION: Colombia and Ecuador.

RECORDS: *Colombia*: Male without specific locality (Ovalle collection). Distrito Especial: Bogotá, 9000 feet, February 17, 1965, male from under box in house; near western hills, 9000 feet, October 9, 1964, male; 8600 feet, September 6, 1964, immature from crack in brick wall (all P. R. Craig). Laguna de Tomine, 15 miles north of Bogotá, 9000 feet, September 27, 1964 (P. R. Craig), female, immature. Two kilometers south of Usme, 9000 feet, June 30, 1965 (P. and B. Wygodzinsky), female, penultimate male, immature. *Antioquia*: Medellín, 1660 meters (Strand, 1914), female. Putumayo: Sibundoy, 2200 meters, May, 1963 (M. L. Bristol), male. *Ecuador*: Pichincha: Near Quito, May 3, 1942 (H. E. Frizzell), male, females, immature. Mt. Pichincha, near Quito, August, 1944 (G. W. Prescott), female. Tungurahua: Baños, 1850–2000 meters, April, 1936 (W. C. McIntyre), male, immature female.

Loxosceles rufipes (Lucas)

Plate 11, figures 8–10, 15, 16

Scytodes rufipes LUCAS, 1834, pl. 6 and facing page. WALCKENAER, 1837, p. 273. GÉRAVAIS, 1840, p. 304. WALCKENAER, 1845, p. xc.

Scytodes omosites WALCKENAER, 1837, p. 273. GÉRAVAIS, 1840, p. 304. KEYSERLING, 1877, p. 217.

Omosites rufipes: SIMON, 1864, pp. 50–51.

Loxosceles rufipes: PICKARD-CAMBRIDGE, 1899 (1897–1905), p. 52, pl. 4, figs. 7–8. PETRUNKEVITCH, 1911, p. 118 (part). BONNET, 1957 (1945–1957, vol. 2, pt. 3), p. 2577. ROEWER, 1942 (1942–1954, vol. 1), p. 321 (*Loxoscelis*). GERTSCH, 1958, p. 33, figs. 66–68, 82.

DIAGNOSIS: This species is readily separated from *panama* and related species by de-

tails of the genitalia. The embolus of the male palpus is a thin, curved spine three times as long as the bulb, and thus far longer than in any known American species. The embolus of *panama* is at most twice as long as the bulb. The seminal receptacles of the female are widely separated, and each receptacle bears two principal branches.

DISCUSSION: *Loxosceles rufipes* exhibits quite striking differences in leg lengths and leg formulas. Short-legged and long-legged males and females occur together in the same collections, and there seem to be no intermediates. It seems unlikely that we are confronted here with two sibling species, inasmuch as the genitalic characters seem to correspond closely in both types. Two females from Finca Bella Vista, Colombia, have the first leg five and 3.9 times as long as the carapace, respectively, and the first femura 1.4 and 1.1 times as long as the carapace. The leg formulas are also variable and in the two females are $2\overline{1}43$ and 2413 , respectively, with the bars indicating equal length, whereas a female from Panama has the formula 2413 .

Coloration and structure like those of *accepta*, *lutea*, and relatives. Carapace bright orange to reddish brown; pars cephalica with series of eight impressed, dusky lines; pars thoracica margined with dusky, dentate band. Tibia and tarsus of female palpus dark reddish brown; tarsus slender, evenly tapered to quite sharp point. Eye recurvature medium; line along front edges of lateral eyes falling behind median eyes by one-third of their diameter; median eyes separated from lateral eyes by one and one-third diameters. Clypeus slightly exceeding in width two diameters of median eye. Eyes of male arranged like those of female, but clypeus not fully as wide as two diameters of median eye.

FEMALE FROM FINCA BELLA VISTA, COLOMBIA: Total length, 8.5 mm. Carapace 3.25 mm. long, 2.6 mm. wide.

	I	II	III	IV	Palp
Femur	4.5	4.8	4.1	4.5	1.1
Patella	1.1	1.1	1.0	1.0	0.4
Tibia	4.5	4.8	3.5	4.2	0.8
Metatarsus	4.7	5.1	4.3	5.2	—
Tarsus	1.3	1.3	1.2	1.2	1.1
Total	16.1	17.1	14.1	16.1	3.4

Leg formula, $2\overline{1}43$; first and fourth legs equal in length. First leg five times as long, first femur about 1.4 times as long, as carapace.

Epigynum as shown in plate 11, figures 15–16.

FEMALE FROM FINCA BELLA VISTA, COLOMBIA: Total length, 7 mm. Carapace 3 mm. long, 2.4 mm. wide.

	I	II	III	IV	Palp
Femur	3.3	3.5	3.1	3.6	0.9
Patella	0.9	0.9	0.9	0.9	0.4
Tibia	3.2	3.4	2.6	3.2	0.7
Metatarsus	3.2	3.5	3.0	3.7	—
Tarsus	1.2	1.2	1.0	1.1	1.0
Total	11.8	12.5	10.6	12.5	3.0

Leg formula, 2413 ; second and fourth legs equal in length. First leg 3.9 times as long, first femur 1.1 times as long, as carapace.

MALE FROM FINCA BELLA VISTA, COLOMBIA: Total length, 6.4 mm. Carapace 2.6 mm. long, 2.3 mm. wide.

	I	II	III	IV	Palp
Femur	5.0	5.5	4.5	5.0	1.8
Patella	0.9	0.9	0.9	0.9	0.8
Tibia	5.2	5.7	4.0	4.7	1.1
Metatarsus	5.8	6.6	5.3	6.4	—
Tarsus	1.5	1.6	1.3	1.4	0.4
Total	18.4	20.3	16.0	18.4	4.1

Leg formula, $2\overline{1}43$; first and fourth legs equal in length. First leg seven times as long, first femur about twice as long, as carapace.

Male palpus as shown in plate 11, figures 8–10. Femur long and thin, about seven times as long as broad. Patella twice as long as broad, about two-thirds as long as tibia. Tibia nearly two and one-half times as long as wide, only twice as long as depth, broadly rounded below and sharply narrow at juncture to patella. Tarsus suboval. Bulb rather small, about equal to tarsus in bulk, with very long, thin embolus three times as long as bulbal portion.

TYPE DATA: Female type from Guatemala, now presumed lost.

DISTRIBUTION: Guatemala, Panama, and Colombia.

RECORDS: *Guatemala*: No specific locality mentioned by Lucas (1834), female type, or by Pickard-Cambridge [1899 (1897-1905)], males, females, these latter in British Museum (Natural History). *Panama*: Santa Rosa, July, 1945 (C. D. Michener), two males, two females. Panama City, February, 1945 (C. D. Michener), male; December 24-25, 1943 (D. L. Frizzell), female. Old Panama City, August 10, 1945 (C. D. Michener and E. Fichter), male, two females. *Colombia*: Finca Bella Vista, near Sasaima, Cundinamarca, March 6, 8, and 18, 1965, one male, four females, some collected in houses on walls; April 7, females collected under boards and tiles in old wooden storeroom, April 9, two immature collected at night with flashlight on trees and bushes (all P. R. and D. L. Craig).

***Loxosceles lawrencei* Caporiacco**

Plate 11, figure 14

DISCUSSION AND DIAGNOSIS: The exact status of this species remains obscure because of the lack of male specimens. Only four or five mature females are known from Venezuela, Trinidad, and Curaçao. For a time I was inclined to refer these to *rufipes* because of the similarity of the epigyna, both of which feature triangular receptacles divided apically into two lobes. *Loxosceles lawrencei* is obviously closely allied to *rufipes* and *panama* of Central America and to a somewhat lesser degree to *lutea*, *chosica*, and other South American species. The legs of *lawrencei* are thinner and longer than those of *rufipes* and about equal in length and dimensions to those of *panama*. Caporiacco mentioned the quite distinct brownish lines on the head and gave measurements of body and appendages of the type from Caracas, which are summarized below. In addition, measurements of another female from Venezuela are offered. The obvious discrepancies between these two sets of measurements probably reflect only differences in equipment and techniques of the authors.

Coloration and structure in close agreement with those of *Loxosceles lutea* Keyserling of Colombia and *L. rufipes* Lucas of Central America. Clypeus equal to two full diameters

of median eye. Eyes strongly recurved; line along front edges of lateral eyes falling behind median eyes by distance equal to their radius; median eyes separated from lateral by one and one-third diameters of former.

FEMALE TYPE FROM CARACAS, VENEZUELA: Total length, 5.75 mm. Carapace 2.15 mm. long, 2.04 mm. wide. Abdomen, 3.64 mm. long.

	I	II	III	IV
Femur	3.22	2.94	2.63	3.10
Patella	0.70	0.70	0.55	0.61
Tibia	3.07	3.36	2.46	2.97
Metatarsus	3.08	3.22	2.52	3.32
Tarsus	1.05	1.18	0.84	0.98
Total	12.24	12.52	10.12	12.20

Leg formula, 2143. First leg 5.7 times as long, first femur 1.5 times as long, as carapace.

FEMALE FROM VENEZUELA: Total length, 5.4 mm. Carapace 2.4 mm. long, 2 mm. wide.

	I	II	III	IV	Palp
Femur	3.2	3.5	3.0	3.4	1.0
Patella	0.7	0.7	0.7	0.7	0.3
Tibia	3.3	3.7	2.5	3.1	0.6
Metatarsus	3.3	3.7	3.1	3.7	—
Tarsus	1.1	1.1	0.9	1.1	0.8
Total	11.6	12.7	10.2	12.0	2.7

Leg formula, 2143. First leg 4.8 times as long, first femur 1.3 times as long, as carapace.

Epigynum (pl. 11, fig. 14) presenting two subtriangular receptacles, each of which is divided apically into two lobes.

TYPE DATA: Female holotype from Caracas, Venezuela, June, 3, 1949 (C. Marcuzzi), in the Universidad Central, Caracas, Venezuela.

DISTRIBUTION: Venezuela, Trinidad, Curaçao.

NEW RECORDS: *Venezuela*: Female without specific data, in Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt. San José del Avila, Caracas, 1940 (R. H. Montgomery), two females. Netherlands Antilles: Curaçao: Fuik (Oostpunt), De-

cember 26, 1962 (H. L. Levi, B. de Jong), six subadult males and females.

***Loxosceles panama* Gertsch**

Plate 11, figures 1–3, 7

Loxosceles rufipes PETRUNKEVITCH, 1925, p. 66.
BANKS, 1929, p. 56.

Loxosceles panama GERTSCH, 1958, p. 35.

DIAGNOSIS: This relative of *rufipes* is readily separated by details of the genitalia: The embolus of the male palpus is only twice as long as the bulb. The receptacles of the epigynum are rounded, undivided, well-separated lobes.

DISCUSSION: This species, so far recorded only from Panama, is likely to range south into Colombia, but at present we have no records of its occurrence in South America. It is included here for comparison with *rufipes*.

COLORATION AND STRUCTURE: Carapace orange or yellowish brown, with median dusky band and longitudinal dusky lines on pars cephalica and dusky patches on side margins of pars thoracica. Legs golden yellow to orange; femora usually dusky. Structure essentially like that of *rufipes*. Eye recurvature medium; line along front edges of lateral eyes falling behind median eyes by half of their diameter; median eyes separated from lateral by two diameters. Clypeus of female equal in height to two and one-half diameters of median eye. Clypeus of male narrower, usually less than full diameter of median eye. Eyes of male like those of female.

FEMALE FROM BARRO COLORADO ISLAND, PANAMA: Total length, 8.5 mm. Carapace 3.55 mm. long, 2.85 mm. wide.

	I	II	III	IV
Femur	4.8	5.0	4.5	4.8
Patella	1.2	1.2	1.2	1.2
Tibia	4.8	5.0	3.7	4.5
Metatarsus	4.7	5.0	4.4	5.0
Tarsus	1.2	1.2	1.0	1.2
Total	16.7	17.4	14.8	16.7

Leg formula, 2413. First leg five times as long, first femur 1.3 times as long, as carapace.

Epigynum as shown in plate 11, figure 7.

MALE FROM BARRO COLORADO ISLAND, PANAMA: Total length, 6.6 mm. Carapace 3.1 mm. long, 2.7 mm. wide.

	I	II	III	IV	Palp
Femur	5.8	6.3	5.1	5.5	1.9
Patella	1.1	1.1	1.1	1.1	0.7
Tibia	6.5	7.1	4.9	5.6	1.1
Metatarsus	6.8	7.6	6.0	6.8	—
Tarsus	1.7	1.7	1.2	1.4	0.2
Total	21.9	23.8	18.3	20.4	3.9

Leg formula, 2143. First leg seven times as long, first femur 1.9 times as long, as carapace.

Male palpus as shown in plate 11, figures 1–3. Femur long, thin, seven times as long as broad at apex. Tibia nearly three times as long as broad and as deep as broad. Tarsus slightly broader than long, suboval, without lateral extensions. Bulb of medium size, with long, sinuous embolus twice as long as bulb.

TYPE DATA: Male holotype from Barro Colorado Island, Gatun Lake, Panama, in the American Museum of Natural History.

DISTRIBUTION: Known only from Panama.

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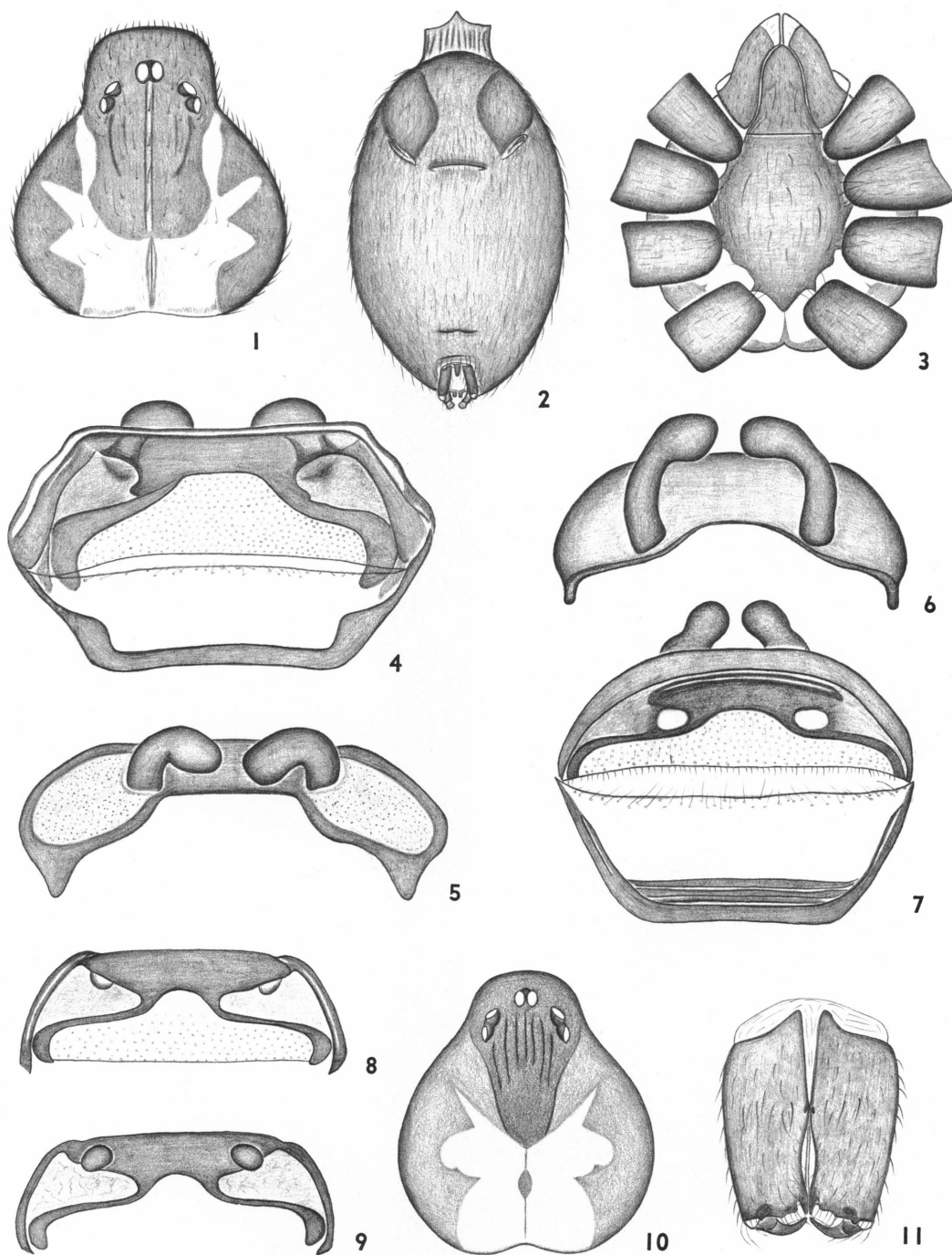
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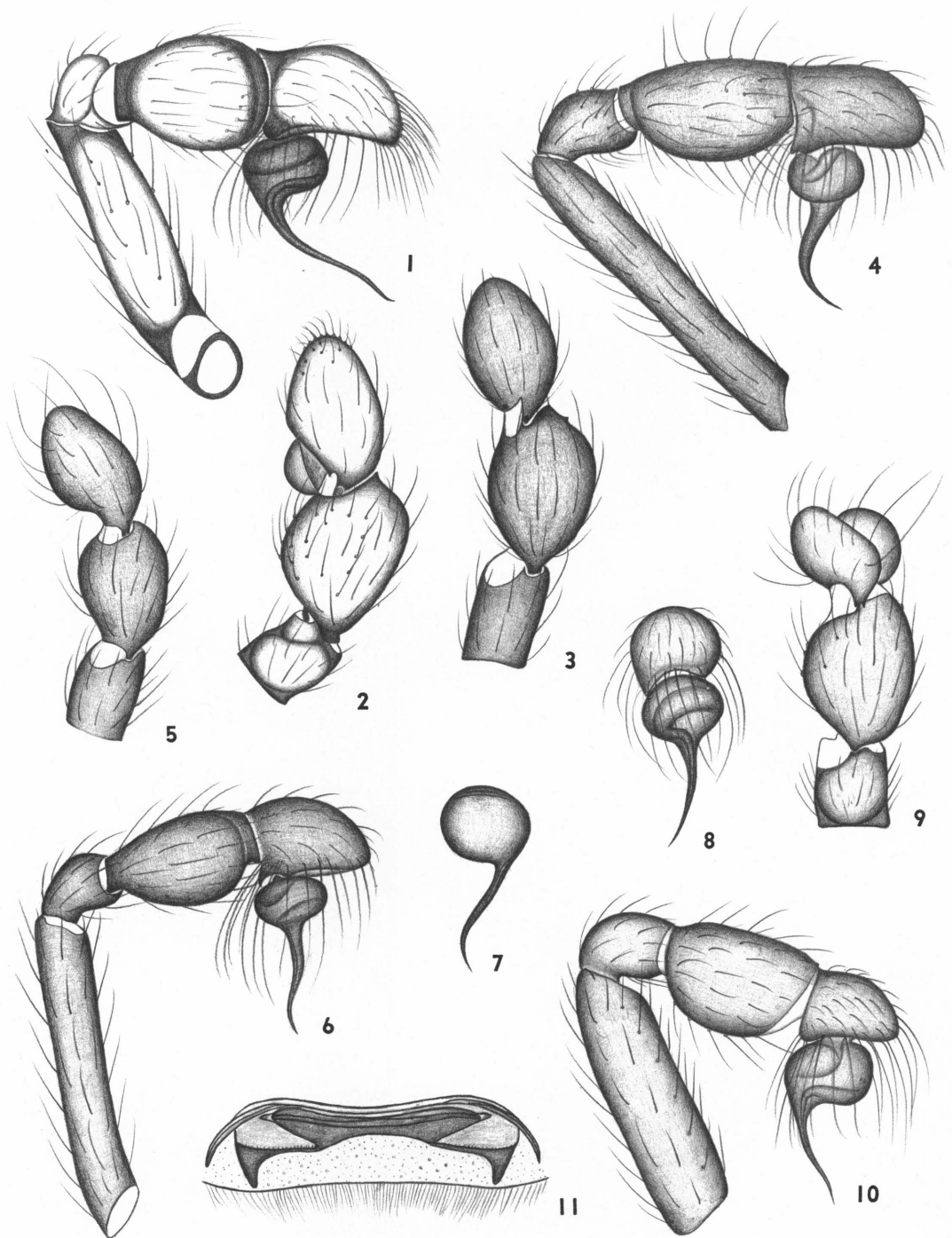
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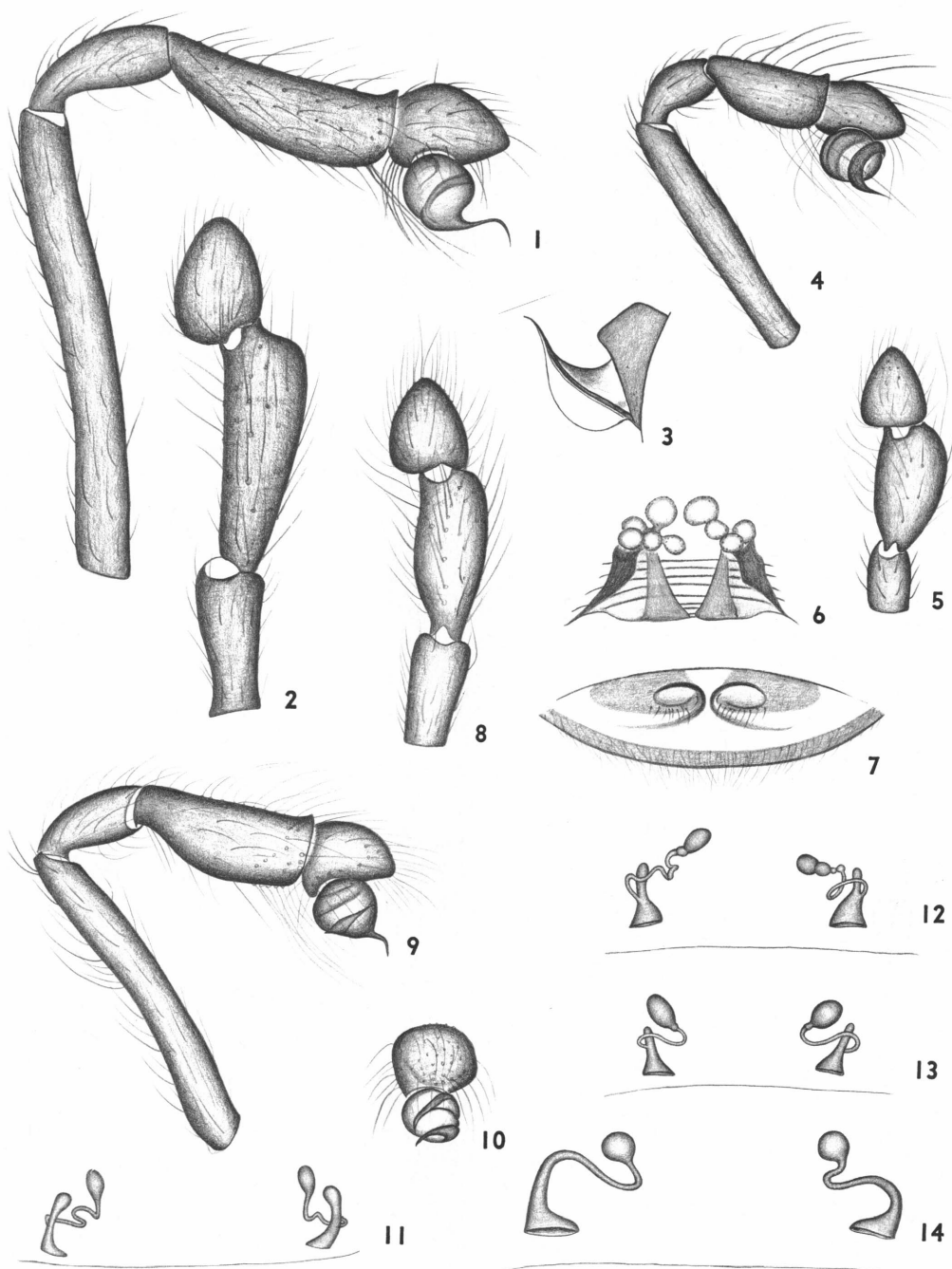
PLATES 3-11



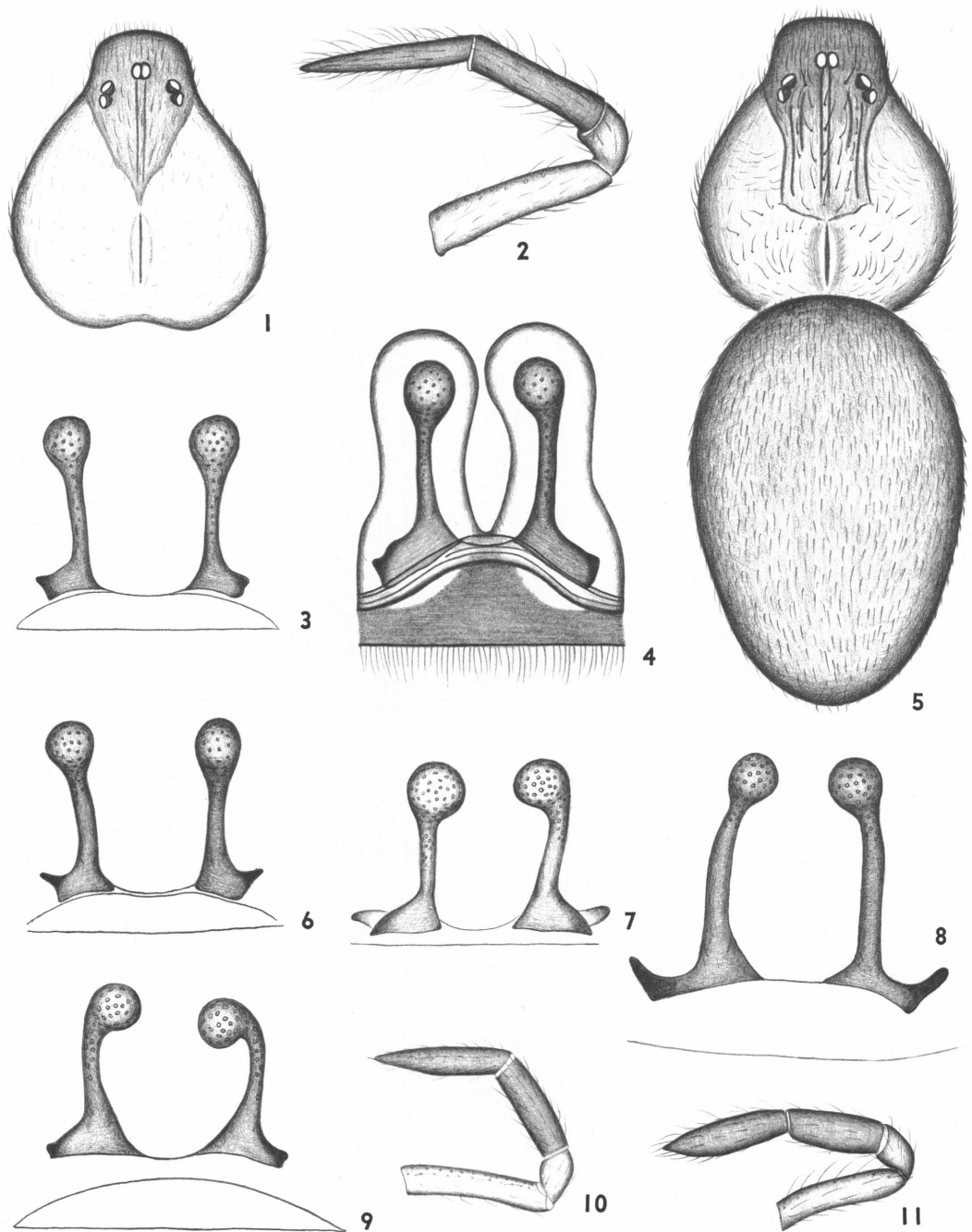
1-5. *Loxosceles gaucho*, new species, female. 1. Carapace. 2. Abdomen, ventral view. 3. Cephalothorax, ventral view. 4. Epigynum, dorsal view. 5. Epigynum, ventral view. 6, 7. *Loxosceles similis* Moenkhaus. 6. Epigynum, dorsal view. 7. Epigynum, ventral view. 8, 9. *Loxosceles variegata* Simon. 8. Epigynum, dorsal view. 9. Epigynum, ventral view. 10, 11. *Loxosceles gaucho*, new species. 10. Carapace of male. 11. Chelicerae of female, frontal view.



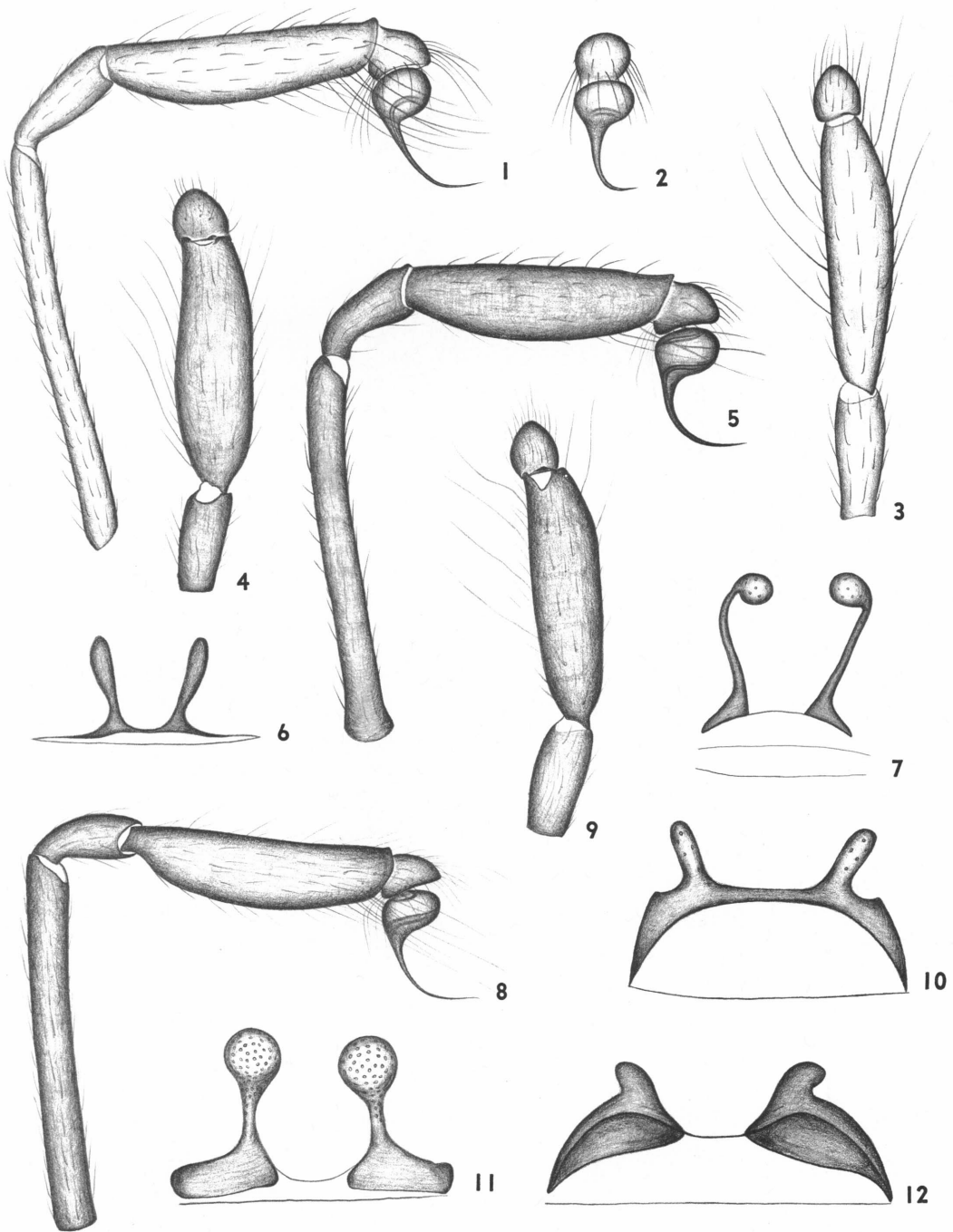
1, 2. *Loxosceles gaucho*, new species, right male palpus. 1. Retrolateral view. 2. Dorsal view. 3, 4. *Loxosceles similis* Moenkhaus, right male palpus. 3. Dorsal view. 4. Retrolateral view. 5, 6. *Loxosceles variegata* Simon, right male palpus. 5. Dorsal view. 6. Retrolateral view. 7-10. *Loxosceles amazonica*, new species, right male palpus. 7. Bulb, subventral view. 8. Tarsus and bulb, apical view. 9. Dorsal view. 10. Retrolateral view. 11. *Loxosceles adelaida*, new species, epigynum



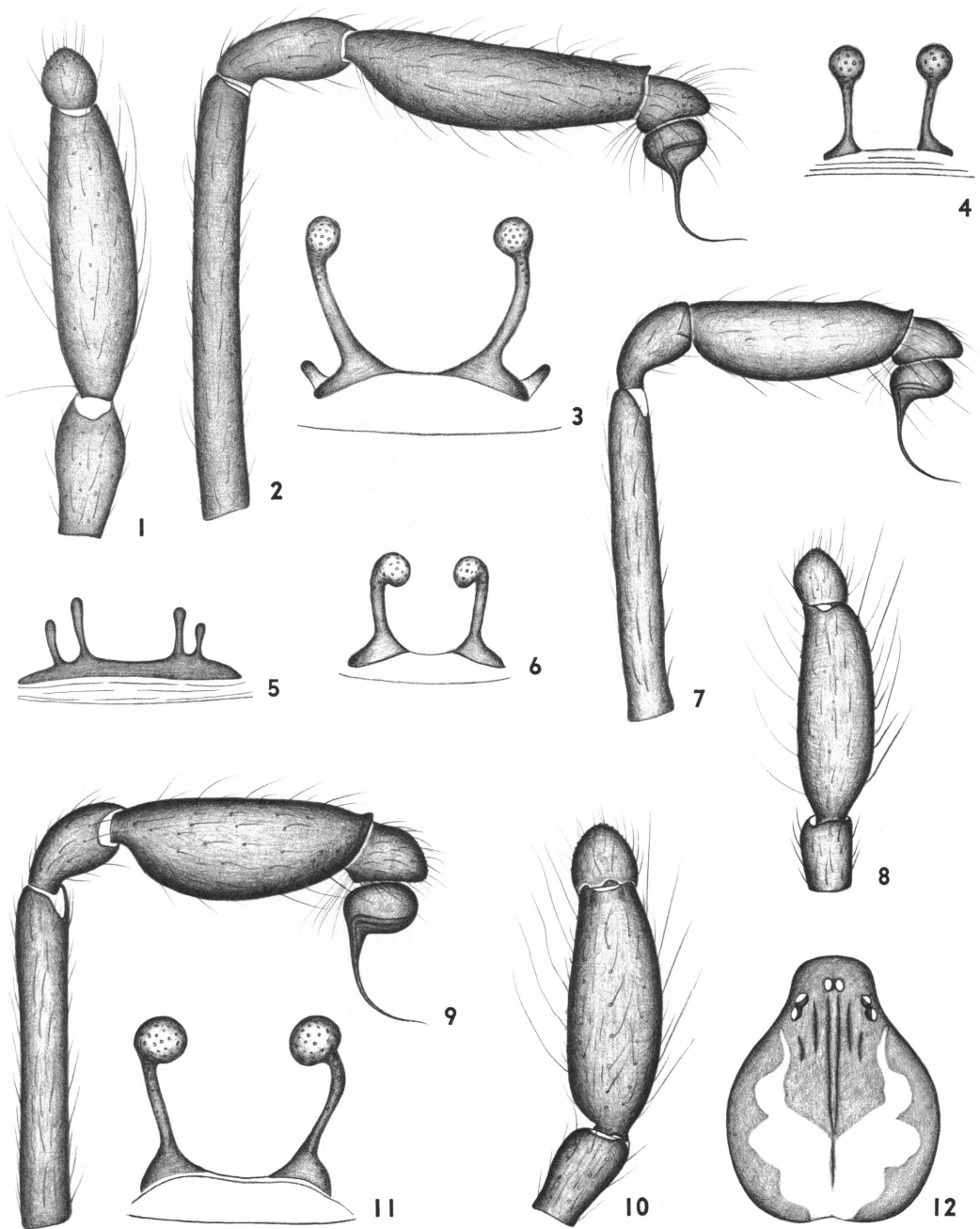
1, 2. *Loxosceles intermedia* Mello-Leitão, right male palpus. 1. Retrolateral view. 2. Dorsal view. 3-5. *Loxosceles hirsuta* Mello-Leitão, right male palpus. 3. Embolus, prolateral view. 4. Retrolateral view. 5. Dorsal view. 6, 7. *Loxosceles amazonica*, new species, epigynum. 6. Dorsal view. 7. Orifices in genital groove. 8-10. *Loxosceles spadicea* Simon, right male palpus. 8. Dorsal view. 9. Retrolateral view. 10. Tarsus and bulb, apical view. 11. *Loxosceles spadicea* Simon, epigynum, dorsal view. 12, 13. *Loxosceles hirsuta* Mello-Leitão, epigyna, ventral views. 14. *Loxosceles intermedia* Mello-Leitão, epigynum, dorsal view



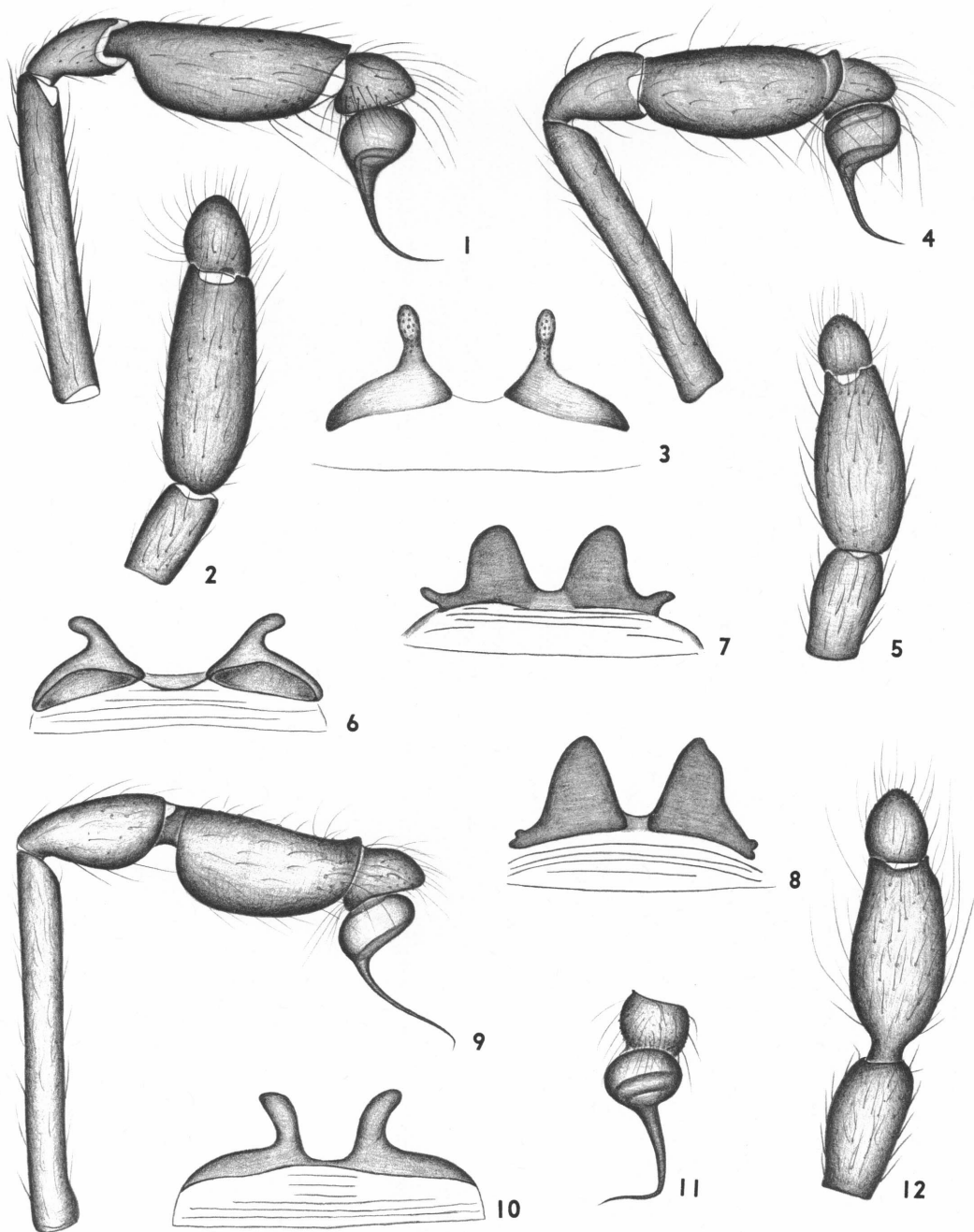
1-9. *Loxosceles laeta* (Nicolet). 1. Carapace of male. 2. Left pedipalp of female, retrolateral view. 3. Epigynum of female from Arequipa, Peru. 4. Epigynum of female from Chinch Islands, Peru. 5. Carapace and abdomen of female. 6. Epigynum, female from Arequipa, Peru. 7. Epigynum of female from Brazil. 8. Epigynum of female from Capac, Peru. 9. Epigynum of female from Porto Alegre, Brazil. 10. *Loxosceles inca*, new species, right pedipalp of female, prolateral view. 11. *Loxosceles lutea* Keyserling, left pedipalp of female, retrolateral view



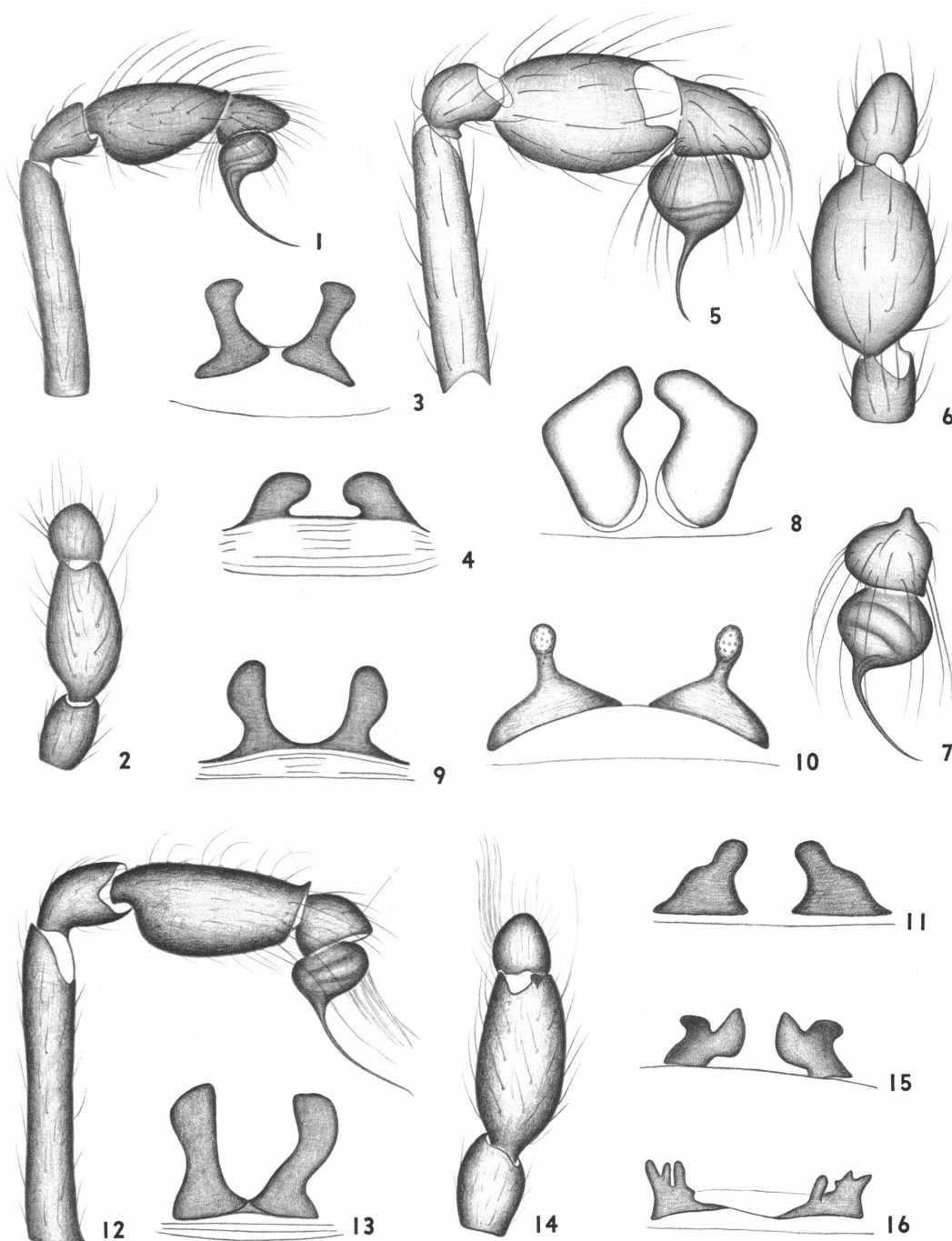
1-3. *Loxosceles laeta* (Nicolet), right palpus of holotype of *longipalpus* Banks. 1. Retrolateral view. 2. Tarsus and bulb, apical view. 3. Dorsal view. 4, 5. *Loxosceles laeta* (Nicolet), right palpus of male from Antofagasta, Chile. 4. Dorsal view. 5. Retrolateral view. 6. *Loxosceles olmea*, new species, epigynum, dorsal view. 7. *Loxosceles blancasi*, new species, dorsal view. 8, 9. *Loxosceles laeta* (Nicolet), right palpus of male from Arequipa, Peru. 8. Retrolateral view. 9. Dorsal view. 10. *Loxosceles harrietae*, new species, epigynum, dorsal view. 11. *Loxosceles julia*, new species, epigynum, dorsal view. 12. *Loxosceles piura*, new species, epigynum, dorsal view.



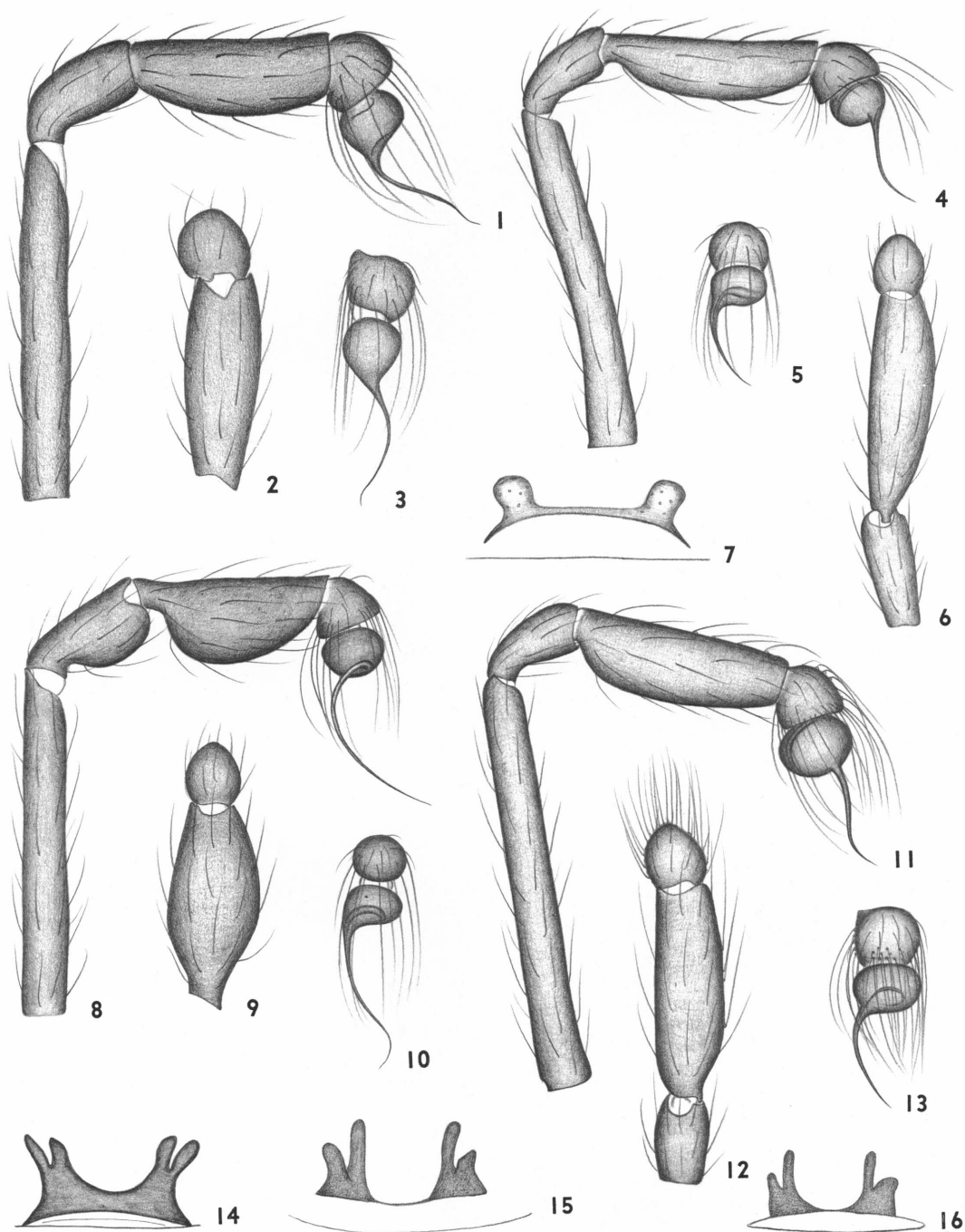
1-3. *Loxosceles herreri*, new species. 1. Right male palpus, dorsal view. 2. Right male palpus, retrolateral view. 3. Epigynum, dorsal view. 4. *Loxosceles surca*, new species, epigynum, dorsal view. 5. *Loxosceles coquimbo*, new species, epigynum, dorsal view. 6. *Loxosceles surca*, new species, epigynum of another female. 7, 8. *Loxosceles weyrauchi*, new species, right male palpus. 7. Retrolateral view. 8. Dorsal view. 9, 10. *Loxosceles conococha*, new species, right male palpus. 9. Retrolateral view. 10. Dorsal view. 11. *Loxosceles weyrauchi*, new species, epigynum, dorsal view. 12. *Loxosceles surca*, new species, carapace of female



1, 2. *Loxosceles accepta* Chamberlin, right male palpus. 1. Retrolateral view. 2. Dorsal view. 3-6. *Loxosceles gloria*, new species. 3. Epigynum, female from San Felipe, Peru. 4. Right male palpus, retrolateral view. 5. Right male palpus, dorsal view. 6. Epigynum, female from Guayaquil, Ecuador. 7, 8. *Loxosceles accepta* Chamberlin, epigyna. 7. Female from Huadachina, Peru. 8. Female from Quillabamba, Peru. 9-12. *Loxosceles bettyae*, new species. 9. Right male palpus, retrolateral view. 10. Epigynum. 11. Tarsus and embolus of palpus, frontal view. 12. Right male palpus, dorsal view



1-3. *Loxosceles lutea* Keyserling. 1. Right male palpus, retrolateral view. 2. Right male palpus, dorsal view. 3. Epigynum, dorsal view. 4. *Loxosceles inca*, new species, epigynum, dorsal view. 5-7. *Loxosceles rufescens* (Dufour), right male palpus. 5. Retrolateral view. 6. Dorsal view. 7. Tarsus and embolus, frontal view. 8. *Loxosceles rufescens* (Dufour), epigynum, dorsal view. 9. *Loxosceles lutea* Keyserling, epigynum, dorsal view. 10. *Loxosceles rosana*, new species, epigynum, dorsal view. 11. *Loxosceles alicia*, new species, epigynum, dorsal view. 12-14. *Loxosceles frizzelli*, new species. 12. Right male palpus, retrolateral view. 13. Epigynum, dorsal view. 14. Right male palpus, dorsal view. 15. *Loxosceles taeniopalpus* Simon, epigynum, dorsal view. 16. *Loxosceles pucara*, new species, epigynum, dorsal view.



1-3. *Loxosceles panama* Gertsch, right male palpus. 1. Retrolateral view. 2. Dorsal view. 3. Tarsus and embolus, frontal view. 4-6. *Loxosceles taeniopalpus* Simon, right male palpus. 4. Retrolateral view. 5. Tarsus and embolus, frontal view. 6. Dorsal view. 7. *Loxosceles panama* Gertsch, epigynum, dorsal view. 8-10. *Loxosceles rufipes* (Lucas), right male palpus. 8. Retrolateral view. 9. Dorsal view. 10. Tarsus and embolus, frontal view. 11-13. *Loxosceles inca*, new species, right male palpus. 11. Retrolateral view. 12. Dorsal view. 13. Tarsus and embolus, frontal view. 14. *Loxosceles lawrencei* Caporiacco, epigynum, dorsal view. 15, 16. *Loxosceles rufipes* (Lucas), epigyna. 15. Female from Panama. 16. Female from Sasaima, Colombia

