

DESCRIPTIONS OF NORTH AMERICAN ARANEÆ OF THE FAMILIES
LYCOSIDÆ AND PISAURIDÆ.¹

BY THOMAS H. MONTGOMERY, JR.

A very considerable number of species of spiders of the families Lycosidæ and Pisauridæ have been described from North America, but for the most the descriptions have barely diagnostic worth. At the present time it is practically impossible to identify most of the species of Walckenaer, Blackwall, Hentz and some others, because some of their species are so insufficiently described that a particular description applies equally well to a number of species. By far the most thorough work so far is that of Keyserling. When the American species are better known than they are at present we shall be in better position to identify the species named by the earlier writers, for then the identification can be done by the process of elimination. The more deeply one enters into the closely intergrading species of the Lycosidæ especially, the more doubtful seems to be the character of attempts to recognize poorly described forms. Nearly the whole southeastern section of the United States and the greater part of the region west of the Mississippi river have been untouched by modern arachnologists; with such a hiatus in the material for comparison, it would be unscientific to make sure of the status of species known only by inadequate diagnoses. It is right to attempt, as far as possible, to recognize the species of earlier writers, but not to uphold names when the type specimens are lost and when the type descriptions are not decisive. When all the species are known, the trial can be undertaken of determining the earlier species.

The Lycosidæ and Pisauridæ are particularly interesting groups because of the difficulties in the way of their study. Not only do the species intergrade closely, but there is very considerable individual variation apart from geographical variation, and the genera are as difficult to define sharply as are the species. No groups are better adapted to prove the idea that the species, as the higher groups, are but concepts, and their delimitation necessary purely for purposes of de-

¹ Contributions from the Zoological Laboratory of the University of Texas, No. 57.

scription and interpretation. What is needed above all, as the preliminary to any morphological or broad ethological study of them, are full and ample descriptions of the structure—of the external genitalia, together with the form and proportions of the cephalothorax, the mouth parts and the legs. The number of the teeth on the tarsal claws is of no value, for it is subject to great individual variation, as has been shown by my student, Mr. Carl Hartmann. The number of teeth on the chelicera is of more importance, but must be used cautiously and at the most as a specific character, for I have found a specimen of *Trochosa purcelli* where one cheliceron differed in the number of its teeth from the other. The number of spines on the joints of the legs may not be greatly subject to individual variation, but in very closely related species it may differ, as *e.g.*, the spines of the ventral surface of tibia I in *Pardosa*. Characters of the relative position of the eyes are decidedly variable in different individuals of some species, apparently constant in some others. Again, some species, particularly of *Trochosa* and *Pirata*, show considerable secondary sexual structural differences. And the epigyna even, perhaps the best of any single structural character, are often variable in their form.

In the present paper I give descriptions of the structure of all those species seen by me, with figures of the genitalia in those cases where they have not been figured before or where the figures have been badly made, and descriptions of the color and dimensions only in the case of new species or where preceding descriptions were not detailed. Where such descriptions conflict with those of my previous papers, they are to be considered as emendations of the latter. In the measurements of the legs the coxæ are included; and by the term "height of the head in front" is meant the distance from the inferior margin of the clypeus to the superior border of the eyes of the second row. Only writers who have given descriptions are included in the synonymical list of each species. All the species previously described by me are described again, but in their structure much more in detail than before; also all the species described by Emerton (1885), except his *Lycosa nigro-ventris* and *Pirata insularis*, are described; and in the Keys all the species from the continent of North America described by Keyserling (1876) are included. No species have been considered from the North American continent south of the United States. With great care I have gone over again the previous descriptions of all the species from this region, but unfortunately the following papers were inaccessible to me: Banks (1894a), Blackwall (1846, 1871), Cragin, Giebel (1869), Girard (1854) and Thorell (1872). Doubtless on account of these

missing papers some mistakes will be found to have crept into the identification of certain species.

My thanks are due to the Academy of Natural Sciences of Philadelphia, and to Mr. Witmer Stone in particular, for the loan of all of their type specimens; and especially to Mr. J. H. Emerton, who not only loaned me a considerable number of specimens, but also by correspondence aided me very materially in the question of the synonymy of certain species: thus he pointed out the identity of his *Pardosa brunnea*, *albomaculata* and *montana* with species described by Thorell; of my *Lycosa ocreata pulchra* with his *Pardosa bilineata*, and of my *Lycosa stonei* with the *Lycosa ocreata* of Hentz.

In regard to the genera I have employed, I must candidly admit that the delimitation of the genera was the most difficult part of the whole study. Simon (1898a) has withdrawn both *Trochosa* and *Pirata* into *Lycosa*, while I maintain their separateness, and this because these two genera intergrade no more closely with *Lycosa* than does *Pardosa*, so that if *Pardosa* is to be upheld, the others must likewise be. It is a question of either making one large comprehensive genus, and for purposes of description subdividing it into a number of subgenera, or of recognizing as many genera. In either case the boundaries of the groups, be they called subgenera or genera, are equally difficult to define. A new genus, *Geolycosa*, is proposed for forms which differ from *Lycosa* by the length and thickness of the first pair of legs. *Pardosa* is composed of rapidly running, usually or always diurnal species, of small size with great length of legs and large ocular area and small chelicera; they are essentially Lycosids which have become diurnal runners. *Geolycosa* is the very opposite, large forms with strong legs and jaws fitted for digging the deep cylindrical holes in which they live. Some of the species of *Pirata* are peculiar in forming small closed nests in which they pass the winter, little cups of silks attached to the under surface of stones. They are generally found close to water. The species of *Trochosa* are nocturnal, living under stones, where they apparently make no excavations. *Sosippus*, according to Simon, builds a large web-sheeting. *Aulonia* has the habits of *Pirata*, and is closely related to it. *Lycosa* is for the most part nocturnal, and many of the species build shallow excavations lined with silk under stones; others are, in the breeding season at least, diurnal, such as *scutulata* and *ocreata*, and these are forms which approach *Pardosa* in their structure. So we find that the structure corresponds pretty closely to the habit: long legs in the diurnal species, high cephalic region in the running and digging species, and low in the sedentary

forms which do not form holes; weak chelicera and short labium associated with slender legs; large eye area is found in the diurnal species, while small eye area is associated with tubicolous forms and species with very short legs. So the genera here defined are based upon both morphological and ethological characters.

Finally, this paper is by no means a comprehensive monograph, but is intended to be a help to the one who comes later with sufficient material at his disposal to make the monograph.

Family LYCOSIDÆ.

Trochanters deeply emarginated below at their distal ends. Legs usually in the order IV, I, II, III. Inferior tarsal claw usually without teeth. Eyes homogeneous, usually unequal and in three rows, the eyes of the first generally smaller than the others. Palpal tibia of ♂ without apophyses.

Family PISAURIDÆ.

With the characters of the *Lycosidæ*, except that the palpal tibia of the ♂ has apophyses, that the inferior tarsal claws are usually toothed, that legs I, II and IV usually differ but little in length, and that the four posterior eyes are more nearly in a line.

KEY TO THE NORTH AMERICAN GENERA OF LYCOSIDÆ.

- a. 1.—Tibia I with 5 ventral pairs of spines, eyes of the first row subcontiguous, SOSILAUS.
- a. 2.—Tibia I with 1–4 ventral pairs of spines, eyes of the first row not subcontiguous.
 - b. 1.—Metatarsus IV in both sexes longer than the patella and tibia combined, eyes of the second row at least 1.5 times their diameter apart, sides of the head nearly or quite vertical, chelicera weak and nearly straight in front, dorsal eye area quite or almost one-quarter the length of the cephalothorax, PARDOSA.
 - b. 2.—Without such a combination of characters.
 - c. 1.—Posterior spinnerets fully 1.5 times as long as the anterior, chelicera weak with the anterior border nearly straight.
 - d. 1.—Posterior margin of the chelicera with 4 teeth, SOSIPPUS.
 - d. 2.—Posterior margin of the chelicera with 2 or 3 teeth.
 - e. 1.—First eye row quite or almost as broad as the second, labium longer than broad, sides of head not vertical in the ♀, PIRATA.

- e.* 2.—First eye row shorter than the second, labium not longer than wide, sides of the head vertical, head projecting forward beyond the clypeus.
- f.* 1.—Metatarsus IV equal in length to the patella and tibia combined, dorsal eye area fully one-third the length of the cephalothorax, *TRABÆA*.
- f.* 2.—Metatarsus IV shorter than patella and tibia combined, dorsal eye area less than one-quarter the length of the cephalothorax, *AULONIA*.
- c.* 2.—Posterior spinnerets little or not longer than the anterior, chelicera usually robust with the anterior border arched.
- d.* 1.—Leg I shorter than IV by not more than one-half the length of tarsus I, and thicker than the other legs, *GEOLYCOSA*.
- d.* 2.—Leg I without such characteristics.
- e.* 1.—Cephalothorax highest at the middle and the sides of the head oblique, first eye row fully or almost as broad as the second, legs usually short with short spines, *TROCHOSA*.
- e.* 2.—Cephalothorax highest in the cephalic region, first eye row usually shorter than the second, legs usually long with long spines, *LYCOSA*.

• Genus **SOSILAUS** Simon, 1898a.

I have not seen this genus, which was created by Simon for a species (*S. spiniger*) from Louisiana. His diagnosis is: "Cephalothorax postice convexus, antice longe declivis et attenuatus, facie sat angusta, obliqua atque obtusa. Oculi quatuor antici inter se subcontigui, in lineam leviter recurvam, medii lateralibus saltem duplo majores. Oculi ser. 2 mediocres, inter se appropinquati, spatium transversum oculorum linea antica multo angustius occupantes. Pars labialis longior quam latior, attenuata et obtusa. Pedes sat longi, metatarsis tarsisque tenuibus longis haud scopulatis, tibiis anticis aculeis pronis 5-5 metatarsis aculeis similibus 3-3 subtus armatis, aculeis que laterali-bus minoribus munitis."

Genus **AULONIA** C. Koch, 1848.

Aulonia humicola (Montg.). Pl. XX, fig. 33.

Pirata humicolus Montgomery, 1902, 1903.

?*Pirata minutus* Emerton, 1885.

Numerous specimens from Pennsylvania and New Jersey.

Eyes.—First row shorter than the second on each side by the full

diameter of one of its lateral eyes, its middle eyes slightly nearer to the lateral eyes than to each other, about double the size of the lateral and placed a little higher. Eyes of the second row very large, separated from each other by about four-fifths their diameter. Third eye row slightly wider than the second. Length of dorsal eye area to cephalothorax as 1 : 4.5. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax in front less than one-half its greatest transverse diameter, low and flattened above, highest just anterior to the middle, its posterior declivity describing an angle of 45° with its dorsal contour. Sides of head vertical. Chelicera with 3 pairs of teeth, shorter than the width of the clypeus, their length about 1.5 times the height of the head in front. Posterior spinnerets about 1.5 times as long as the anterior, with the terminal joint longer than wide. Labium about as broad as long, rounded apically. Metatarsus IV shorter than patella and tibia combined. Length of leg IV to cephalothorax (\varnothing) as 3.4 : 1. The first two eye rows project forward beyond the clypeus. \varnothing palpal claw with 6 fine teeth.

Comparisons.—This minute species agrees essentially with Simon's (1898a) diagnosis of *Aulonia*, except that the first row of eyes is less strongly procurved. It differs from *Pirata*, as I define it, in the sides of the head being vertical, and the labium being no longer than wide.

Genus **TRABÆA** Simon, 1876.

Trabæa aurantiaca (Emert.). Pl. XX, figs. 31, 32.

Aulonia aurantiaca Emerton, 1885.

Trabæa aurantiaca (Emerton), Simon, 1898.

(1 ♂ from Massachusetts, collected by Mr. Emerton.)

Eyes.—First row shorter than the second, eyes equal, middle eyes nearer to each other than to the lateral and higher than the latter. Eyes of the second row very large, on prominences, slightly less than their diameter apart. Third row slightly wider than the second, its eyes on prominences and directed backward. Dorsal eye area fully one-third the length of the cephalothorax. Quadrilateral of the posterior eyes as long as broad.

Form.—Cephalothorax in front truncated and almost one-half its greatest transverse diameter, the cephalic portion projecting forward beyond the clypeus, highest at the ocular area. The sides of the head vertical, head narrower at the clypeus than at the level of the eyes of the second row. Chelicera with 3 pairs of teeth (not 2 as stated by Simon, 1898a), slender and weak, their length less than the greatest height of the head, but greater than the width of the clypeus. Labium

broader than long. Sternum longer than broad, pointed posteriorly. Posterior spinnerets about twice as long as the anterior. Tarsi without scopulæ; metatarsus IV as long as patella and tibia combined. Length of leg IV to cephalothorax as 4 : 1.

Comparisons.—This genus approaches both *Aulonia* and *Pardosa*.

Genus **PARDOSA** C. Koch, 1848.

The main distinguishing characters of this genus are those mentioned in the Key, namely: Metatarsus IV longer than patella and tibia combined; eyes of the second row at least 1.5 times their diameter apart; sides of the head more or less vertical; chelicera weak and nearly straight in front (their length not more than one and three-fifths times the height of the head in front, with 3 pairs of teeth); and the dorsal eye area quite or almost one-quarter the length of the cephalothorax. Further, the cephalothorax is always highest at the posterior eyes, and in front not more than one-half its greatest transverse diameter; and the legs are long and slender with long spines, the fourth leg never less than 4.2 times the length of the cephalothorax, and very frequently the legs are proportionately longer in the females than in the males (the reverse being the case in the other genera). The labium is small, not one-half the length of the maxillæ, and usually not longer than wide (except in *mercurialis*, *glacialis* and *groenlandica*). The posterior spinnerets are longer than the anterior, and the first eye row always shorter than the second. The ♂ palpal organ is usually very large. Tibia I has either 3 or 4 pairs of ventral spines.

The relationships of the genus are with *Trabæa* and *Lycosa*.

KEY TO SPECIES OF PARDOSA.

- a. 1.—Dorsal eye area more than one-quarter the length of the cephalothorax, cephalothorax less than 3 mm.
 - b. 1.—Coxæ above without spots, middle eyes of the first row largest, *scita*.
 - b. 2.—Coxæ above spotted with black, eyes of the first row adequal.
 - c. 1.—Median thoracal band much narrowed behind the dorsal groove, body dark colored, *minima*.
 - c. 2.—Median band of cephalothorax with nearly parallel margins, body pale colored, *pallida*.
- a. 2.—Dorsal eye area not more than one-quarter the length of the cephalothorax.
 - b. 1.—Cephalothorax from 3.8–5 mm. in length.
 - c. 1.—All the joints of the legs except the tarsi thickly covered with fine long hairs, *groenlandica*.
 - c. 2.—Hairs on the legs short, *glacialis*.

- b. 2.—Cephalothorax from 2.2–3.5 mm. in length.
- c. 1.—Sternum not darker than the coxæ, . . . *pauxilla*.
- c. 2.—Sternum much darker than the coxæ.
- d. 1.—Cephalothorax with distinct median and submarginal light bands.
- e. 1.—Cephalothorax in front one-half its greatest transverse diameter, *flavipes* Keyserling.
- e. 2.—Cephalothorax in front less than one-half its greatest transverse diameter.
- j. 1.—Legs hairy, posterior half of abdominal dorsum with scattered light spots, *mercurialis*.
- j. 2.—Legs with very few hairs, posterior half of abdominal dorsum with a row of 5–6 large transverse light spots, *nigropalpis*.
- d. 2.—Cephalothorax without a light submarginal band, and with the median band indistinct,
- e. 1.—Coxæ, trochanters and femora above darker than the other joints of the legs, *lapidicina*.
- e. 2.—Coxæ, trochanters and femora not darker than the other joints of the legs, *tachypoda*.

Pardosa pauxilla n. sp. Pl. XIX, figs. 22, 23.

(Numerous males and females, Austin, Texas.)

Eyes.—First row nearer the second than the margin of the clypeus, shorter than the second, the middle eyes higher and twice as large as the lateral. Eyes of second row largest, about 1.75 times their diameter apart. Dorsal eye area one-fourth the length of the cephalothorax. Quadrilateral of the posterior eyes wider than long.

Form.—Cephalothorax in front truncated and not quite one-half its greatest transverse diameter, highest at the posterior eyes. The head is steep on the sides, proportionately much higher in the male. The chelicera are shorter than the width of the clypeus, weak, not more than 1.3 times the height of the head in front. Sternum longer than broad. Labium wider than long, apically rounded, less than one-half the length of the maxillæ. The legs are long and slender, leg IV to the cephalothorax, ♂ 4 : 1, ♀ 4.2 : 1; metatarsus IV longer than the patella and tibia combined. Posterior spinnerets fully 1.5 times the length of the anterior. ♀ palpal claw with 3 teeth. Four ventral pairs of spines on tibia I. ♂ palpus large, quite as long as the cephalothorax, tibia and tarsus thickened, two rows of long hairs on the inferior surface of the femur; tibia and tarsus with long hairs on the median and lateral aspects.

	Dimensions.	♂	♀
Cephalothorax,		1.8	2 - 2.9
Abdomen,		2	2 - 3.5
Leg I,		5.5	6.3-10
Leg II,		5.4	5.5- 9.9
Leg III,		5	5.4- 9.2
Leg IV,		7	8.8-13

Color of Males (in alcohol).—*Cephalothorax* deep black in the eye region and forehead, this black becoming brown more posteriorly; a median yellow band arises at the dorsal groove and passes back (becoming gradually wider) to the posterior end of the thorax; on each side is a broad submarginal yellow band; the extreme margin is black. *Sternum* clear yellow, or suffused with black on its anterior half. *Abdomen* above deep black or brown. In light individuals there is a median yellow band, broadest anteriorly, extending the whole length of the dorsum, bordered anteriorly by four pairs of small black dots, and posteriorly banded by transverse lines of yellow wider than the band itself. In dark individuals the dorsum is deep black, with only a trace of the median band at the anterior end. Sides gray and the venter yellow in one specimen; in the others the venter is more or less blackish with a black mark at the genital aperture, and a broad median black band. *Chelicera*, *maxillæ* and *labium* deep black to yellowish. *Legs* clear yellow without rings, with more or less black on the first femora. *Palpi* deep black.

Color of Females (in alcohol).—*Cephalothorax* with the ocular region deep black and the forehead yellow. A median yellow band arises narrowly between the third eyes, shortly behind enlarges to a diameter somewhat less than the distance between these eyes, narrows again in front of the dorsal groove, enlarges again very slightly around this groove, and then passes back, becoming narrower, to the posterior end of the thorax. Medio-posteriorly from each eye of the third row a short brown line obliquely incises the median band. The median band is bordered on each side by a broader brown band transversed by radial lines of black. On each side is a broad submarginal yellow band, narrower than the contiguous brown band, which joins with its fellow of the opposite side below the anterior eyes. *Sternum* yellow like the coxæ, sometimes with indistinct darker marginal markings. *Abdomen* above quite variable, either (1) with a broad shining yellow median band along its entire length, containing in its anterior half a narrower greenish-yellow band terminating in a point at the middle, the latter band with four black spots on each margin; or (2) the greenish-yellow

median band is not enclosed by a broader yellow one, and behind it is either a silvery (or yellowish) band with scalloped margins extending back to the spinnerets, or else a series of contiguous spots of one of these colors, each containing a pair of minute black dots. The median light area of the dorsum is bordered on each side by a broader black band, mottled with yellowish. The sides are gray or yellowish, streaked with black. Venter grayish-yellow, spinnerets clear yellow, epigynum reddish. *Chelicera*, *maxillæ* and *labium* yellowish. *Legs* yellow, distinctly ringed with black or brown on all joints except the tarsi. *Palpi* yellow, sometimes with black markings on the femora.

Comparisons.—This species approaches most nearly to *pallida* and *minima*, but differs from both in genitalia and coloration. The sexes are very dissimilarly colored, and sometimes show great differences in size.

Habits.—A common species, found always near water, the males abundant.

Pardosa mercurialis n. sp. Pl. XIX, figs. 20, 21.

(Numerous specimens from Austin, Texas.)

Eyes.—First row nearer the second than to the clypeal margin, straight, slightly shorter than the second, middle eyes largest, eyes equidistant. Eyes of second row largest, nearly twice their diameter apart. Third row widest, its eyes almost twice their diameter behind the second row. Dorsal eye area almost one-fourth the length of the cephalothorax. Quadrilateral of the posterior eyes slightly broader than long.

Form.—Cephalothorax in front not quite one-half its greatest transverse diameter, highest in the cephalic region, sides of head steep. *Chelicera* weak, longer than the width of the clypeus, with three pairs of teeth. Sternum longer than broad. *Labium* considerably less than one-half the length of the *maxillæ*, slightly longer than broad, rounded apically. Posterior spinnerets longest. *Legs* very long and slender, metatarsus IV longer than tibia and patella combined; length of leg IV to the cephalothorax, ♂ 4.8 : 1, ♀ 5.8 : 1. Tibia I with four ventral pairs of spines. ♀ palpal claw with three teeth.

Color of Females (in alcohol).—*Cephalothorax* above black in the eye area, followed by a broad reddish-yellow median band, which is constricted before the middle, enlarged to fully the diameter of the eye area around the dorsal groove (its widest portion), and narrowed to one-half that width behind the dorsal groove. There is a broad interrupted submarginal line of the same color, the region between these

yellow bands being blackish. *Sternum* deep black, frequently with a median yellow band on its anterior half. *Abdomen* above intricately but distinctly patterned with black and greenish-yellow, as follows: on the anterior half of the dorsum is a broad median band, ending bluntly at the middle, yellow anteriorly and brown posteriorly and containing in its anterior portion a pair of short black stripes; behind this band are groups of small black dots on a yellow ground, the more posterior of them tending to form ill-defined transverse rows. The sides are yellow with black dots. The venter gray or yellow, blackish around the epigynum, sometimes with a narrow median blackish line that occasionally widens to form a spot in front of the spinnerets. *Chelicera* reddish-brown, *maxillæ* and *labium* lighter. *Legs* above distinctly banded with yellow and blackish on all the joints except the tarsi, the femora greenish below. *Palpi* yellowish.

Color of Males.—Like the females, but somewhat darker, and with the palpal tarsus black.

In life the markings are gray and black, making the animal very protectively colored; in alcohol the gray changes to yellow.

	<i>Dimensions.</i>		♂	♀
Cephalothorax,			3	3.2
Abdomen,			3	4
Leg I,			11	13.5
Leg II,			10.5	13
Leg III,			10.2	13
Leg IV,			14.5	18.5

Comparisons.—This species comes closest to *lapidicina* Em., but is separable from it on account of the following characters: The posterior transverse plate of the epigynum is always much narrower, and the ♂ palpal organ with a large tooth not present in *lapidicina*; smaller absolute size, while the length of the legs is proportionately greater; the lighter coloring of the dorsal surface and the different abdominal pattern.

Habits.—The most abundant Lycosid in the vicinity of Austin, diurnal, and running with great swiftness. Usually found close to water.

***Pardosa pallida* Emerton.**

Pardosa pallida Emerton, 1885.

Pardosa pallida Emerton, Montgomery, 1903.

(1 ♀ from Massachusetts.)

Eyes (♀).—First row straight, nearer the second row than to the margin of the clypeus, eyes adequal and equidistant. Eyes of second

row largest, almost twice their diameter apart. Length of dorsal eye area to cephalothorax as 1 : 3.75. Quadrilateral of the posterior eyes as long as wide.

Form (♀).—Cephalothorax highest at the posterior eyes, in front truncated and almost one-half its greatest transverse diameter, the sides of the head steep. Chelicera with 3 pairs of teeth, weak, as long as the width of the clypeus, their length 1.5 times the height of the head in front. Labium wider than long, apically truncated, not one-half the length of the maxillæ. Sternum longer than broad, truncated behind. Posterior spinnerets nearly double the length of the anterior. Metatarsus IV longer than the patella and tibia combined; leg IV to the cephalothorax as 4.4 : 1; tibia I with 3 pairs of ventral spines.

Pardosa lapidicina Emerton. Pl. XIX, fig. 24.

Pardosa lapidicina Emerton, 1885.

Pardosa lapidicina Emerton, Montgomery, 1903.

(Specimens from Wood's Hole, Massachusetts.)

Eyes.—First row shorter than the second, straight, equidistant from the second row and the clypeal margin, the middle eyes larger and nearer to the lateral eyes than to each other. Eyes of the second row largest, twice their diameter apart. Length of the dorsal eye area to the cephalothorax as 1 : 4.5. Quadrilateral of the posterior eyes decidedly broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front truncated and less than one-half its greatest transverse diameter, the sides of the head moderately steep. Chelicera with 3 pairs of teeth, shorter than the width of the clypeus, in length 1.75 times the height of the head in front. Labium a little longer than wide, not one-half the length of the maxillæ, slightly rounded apically. Sternum longer than broad. Posterior spinnerets longest. Metatarsus IV longer than the patella and tibia combined; length of leg IV to cephalothorax, ♂ 4.5 : 1, ♀ 5 : 1. ♀ palpal claw with 3 teeth. Tibia I with 4 ventral pairs of spines.

Pardosa scita Montg.

Pardosa scita Montgomery, 1902.

(Specimens from Pennsylvania.)

Eyes.—First row narrower than the second, much nearer the second row than to the margin of the clypeus, straight, middle eyes larger, eyes equidistant. Eyes of second row largest, twice their diameter apart. Length of dorsal eye area to cephalothorax as 1 : 3.5. Quadrilateral of the posterior eyes slightly broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front truncated and less than one-half its greatest transverse diameter. Chelicera with 3 pairs of teeth, weak, nearly straight in front, shorter than the width of the clypeus, in length 1.3 the height of the head in front. Labium broader than long, apically rounded, not one-half the length of the maxillæ. Sternum longer than broad. Posterior spinnerets nearly 1.5 times the length of the anterior. Length of leg IV to cephalothorax, ♂ 5 : 1; metatarsus IV longer than patella and tibia combined. Tibia I with 4 ventral pairs of spines.

***Pardosa minima* (Keys.).**

Lycosa minima Keyserling, 1876.

Pardosa albopatella Emerton, 1885.

Pardosa albopatella Emerton, Stone, 1890.

Pardosa minima (Keys.), Montgomery, 1902.

(Specimens from Pennsylvania and Massachusetts.)

Eyes (♂).—First row narrower than the second, straight, slightly nearer the second row than to the margin of the clypeus, middle eyes nearer the lateral than each other. Dorsal eye area to cephalothorax as 1 : 3.5. Quadrilateral of the posterior eyes broader than long. Eyes of the second row largest, separated by 1.75 times their diameter.

Form (♂).—Cephalothorax highest at the posterior eyes, in front truncated and less than one-half its greatest transverse diameter, sides of head steep. Chelicera with 3 pairs of teeth, shorter than the width of the clypeus, in length 1.5 times the height of the head in front. Labium at the base as wide as long, truncated apically, not one-half the length of the maxillæ. Sternum longer than broad. Posterior spinnerets longest. Length of leg IV to cephalothorax as 4.3 : 1; metatarsus IV longer than patella and tibia combined. Tibia I with 4 ventral pairs of spines.

Comparison.—This species is most closely related to *nigropalpis*. The ♂ of *minima* can be readily distinguished from that of *nigropalpis* in having the palpal patella entirely white instead of deep black, in the different coloration of the legs, and in the difference in size of the eye area. But the females of the two are much more difficult to distinguish, and there is no good structural difference in the structure of the epigyna. In the ♀ of *minima* it is the usual case that the palpal patella has no dark spots below (they are usually present in *nigropalpis*); the sternum is brown (never deep black) with a yellow median line anteriorly and a broader black one posteriorly and with some black on the margins (in *nigropalpis* in the majority of specimens deep black with a yellow median line anteriorly); the femora below usually yellow

spotted with black (in *nigropalpis* usually blackish); finally the cephalothoracal median yellow band usually encloses a broad reddish-brown area at its anterior end (usually not so in *nigropalpis*). Of all these differences the only one that appears to be constant is the first. *Minima* averages smaller in size, but then *nigropalpis* is very variable in this respect; and *nigropalpis* has generally the dark annulations on the legs much more distinct, but some individuals of *minima* from Wood's Hole, Massachusetts, have the legs just as distinctly banded.

Pardosa glacialis (Thor.). Pl. XIX, fig. 25

Lycosa glacialis Thorell, 1872.

Pardosa brunnea Emerton, 1885.

(Specimens from Mt. Washington, New Hampshire.)

Eyes.—First row narrower than the second, nearer to the second row than the clypeal margin, middle eyes larger and distinctly lower. Eyes of second row largest, separated by fully 1.5 times their diameter. Dorsal eye area to cephalothorax as 1 : 4.5. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front less than one-half its greatest transverse diameter, sides of head rather vertical. Chelicera with three pairs of teeth, longer than the breadth of the clypeus, in length 1.5 times the height of the head in front. Labium longer than broad, rounded at the tip, not one-half the length of the maxillæ. Sternum longer than broad, pointed behind. Posterior spinnerets about 1.5 times as long as the anterior. Metatarsus IV slightly longer than patella and tibia combined, leg IV to cephalothorax as 4.3 : 1, the legs rather hairy with weak scopulæ. ♀ palpal claw with 4 teeth. Tibia I with 3 ventral pairs of spines.

Pardosa groenlandica (Thor.).

Lycosa groenlandica Thorell, 1872.

Pardosa albomaculata Emerton, 1885.

(Specimens from Mt. Washington, New Hampshire.)

Eyes.—First row shorter than the second, much nearer to it than to the clypeal margin, about straight, eyes adequal. Eyes of the second row largest, about 1.5 times their diameter apart. Dorsal eye area to length of cephalothorax as 1 : 4.5. Quadrilateral of the middle eyes broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front one-half its greatest transverse diameter, sides of the head steep. Chelicera with 3 pairs of teeth, in length more than the width of the clypeus and 1.5 times the height of the head in front. Labium longer than broad, truncated apically, not one-half the length of the maxillæ. Sternum

longer than broad, pointed behind. Metatarsus IV longer than the patella and tibia combined. Leg IV to cephalothorax as 4.4 : 1. Posterior spinnerets 1.5 times the length of the anterior. ♀ palpal claw with 5 teeth. The legs and upper surface of the body are thickly clothed with long, soft hairs. Tibia I with 3 ventral pairs of spines.

Pardosa tachypoda Thor. Pl. XIX, fig. 26.

Pardosa tachypoda Thorell, 1872.

Pardosa montana Emerton, 1885.

Pirata procursus Montgomery, 1902.

(1 ♀ from Mt. Washington, New Hampshire.)

Eyes (♀).—First row shorter than the second and nearer it than to the clypeal margin, eyes adequal, middle eyes distinctly lower. Eyes of second row largest, about 1.6 their diameter apart. Length of dorsal eye area to cephalothorax as 1 : 4.2. Quadrilateral of the posterior eyes broader than long.

Form (♀).—Cephalothorax highest at the posterior eyes, in front decidedly less than one-half its greatest transverse diameter, sides of the head rather oblique. Chelicera with 3 pairs of teeth, as long as the width of the clypeus, rather strong. Sternum longer than broad, pointed behind. Posterior spinnerets longer than the anterior. Labium wider than long, rounded apically, not one-half the length of the maxillæ. Third leg as long as the first; metatarsus IV longer than patella and tibia combined; leg IV to cephalothorax as 4.4 : 1.

Pardosa nigropalpis Emerton.

Pardosa nigropalpis Emerton, 1885.

Pardosa nigropalpis Emerton, Stone, 1890.

Pardosa nigropalpis Emerton, Montgomery, 1902.

(Numerous specimens from Pennsylvania, Massachusetts, New Jersey and Austin, Texas.)

Eyes.—First row shorter than the second, straight, nearer it than to the margin of the clypeus, middle eyes slightly larger and nearer the lateral eyes than to each other. Eyes of second row largest, 1.5 times their diameter apart. Dorsal eye area one-fourth the length of the cephalothorax. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front truncated and less than one-half its greatest transverse diameter. Sides of the head steep. Chelicera with 3 pairs of teeth, weak, nearly straight anteriorly, shorter than the width of the clypeus and 1.3 times the height of the head in front. Labium shorter than broad, rounded apically, not one-half the length of the maxillæ. Sternum longer than broad, pointed behind. Posterior spinnerets fully 1.5 times the length of the inferior. Length of leg IV to cephalothorax, ♂ 4.5 : 1, ♀ 5 : 1.

Metatarsus IV longer than patella and tibia combined. Tibia I with 4 ventral pairs of spines. ♀ palpal claw with 1 small tooth.

Comparisons.—This species comes very close to *Lycosa* (*Pardosa*) *flavipes* Keyserling, and appears to differ from it mainly in that the leg IV is not longer than I by double the length of metatarsus IV. Compare also *P. minima*.

The Texas specimens are lighter than the northern ones, and the venter is often without black markings.

Genus **SOSIPPUS** Simon, 1888. †

The North American species of this genus described by Simon (*S. floridanus*) has not been seen by me. The posterior spinnerets are longer than the anterior, with the apical joint as long or almost as long as the basal and garnished with fusules on its inner surface; the labium is longer than wide and quite one-half the length of the maxillæ; the posterior margin of the chelicera has 4 teeth. The face is vertical only in the plane of the anterior eyes. The legs are long, the anterior tarsi and metatarsi usually scopulated, metatarsus IV as long as the patella and tibia combined. First row of eyes broader than the second, the lateral eyes as large or larger than the middle ones. The integument is covered with plumed hairs. The sides of the head are nearly vertical.

Evidently this genus is most closely allied to *Pirata*. They spin a large web like that of an *Agalena*.

Genus **LYCOSA** Latreille, 1804 (ad partem).

I have followed Simon (1898) in defining this genus, except that I have excluded from it *Pirata* and *Trochosa*.

The main characters are the following: The cephalothorax is highest in the cephalic portion (except in the ♂ of *charonoides*), and the sides of the head usually only moderately oblique; the first eye row is shorter than the second (except in *inhonesta* and in the ♂ of *charonoides*); the eyes of the second row are never separated by more than 1.5 times their diameter; the chelicera are robust and their length is usually quite twice the height of the head in front (except in the Pardo-soid species *bilineata*, *relucens* and *ocreata*); the posterior spinnerets are shorter, or but little longer, than the anterior (*antelucana*, *mccooki*, *scutulata*); tibia I has 3 pairs of ventral spines; the labium is shorter than one-half the length of the maxillæ, but longer than wide (except in *bilineata* and *scutulata*); metatarsus IV is shorter than the patella and tibia combined (except in the ♂ of *scutulata*, *antelucana* and *ocreata*). The length of the dorsal eye area to the cephalothorax

varies from 1 : 4.5 to 1 : 7. The length of leg IV to the cephalothorax from 2.7 : 1 to 4.7 : 1. The legs are usually well scopulated.

Lycosa intergrades very closely with *Pardosa*, and the species *bilineata*, *relucens*, *ocreata* and *scutulata* are quite intermediate. The relationship with *Trochosa* is equally close. More remote are the relations to *Pirata*, yet *P. elegans* has a number of Lycosoid characters.

KEY TO SPECIES OF LYCOSA.

- a. 1.—Abdomen above with a distinct, broad dark median band extending its entire length.
 - b. 1.—Sternum black, *punctulata*.
 - b. 2.—Sternum yellow, *scutulata*.
- a. 2.—Abdomen not so colored.
 - b. 1.—Cephalothorax smooth, without hairs, not more than 2.5 mm. long.
 - c. 1.—Eyes of the second row about 1.3 times their diameter apart, venter brown, *nigra*.
 - c. 2.—Eyes of the second row not quite their diameter apart, venter yellow with a few brown spots, *rugosa* Keyserling.
 - b. 2.—Cephalothorax haired, more than 2.5 mm. long.
 - c. 1.—Cephalothorax with a very narrow median light band, *inhonesta*.
 - c. 2.—Cephalothorax with a broad median band.
 - d. 1.—Cephalothorax 5 mm. or more in length.
 - e. 1.—Eyes of the second row fully 1.5 times their diameter apart, *pictilis*.
 - e. 2.—Eyes of the second row about their diameter apart.
 - f. 1.—Cephalothorax less than one-quarter longer than broad, *pulchra* Keyserling.
 - f. 2.—Cephalothorax decidedly more than one-quarter longer than broad.
 - g. 1.—Legs not annulated, abdomen with a dorso-median light band extending its entire length and including a dark band in its anterior half, *lepida*.
 - g. 2.—Legs distinctly annulated, abdomen not so colored.
 - h. 1.—Median band of the cephalothorax not or scarcely constricted anterior to the median groove, . . . *mccookii*.
 - h. 2.—Median band of the cephalothorax deeply constricted anterior to the median groove.
 - i. 1.—Venter light, *euepigynata*.

Lycosa euepigynata n. sp. Pl. XVIII, figs. 1, 2.

(Numerous specimens from Austin, Texas.)

Eyes.—First row equidistant from the clypeal margin and the second row, shorter than the second (the middle points of its lateral eyes fully or almost as lateral as the middle points of the lateral eyes of the second row), its middle eyes higher than and double the size of the lateral. Eyes of second row largest, not quite their diameter apart. Eyes of third row about one and a half times their diameter behind the second row. Dorsal eye area about one-fifth the length of the cephalothorax. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax in front truncated nearly straight and in the ♀ about one-half its greatest transverse diameter (less in the ♂), highest between the posterior eyes and the dorsal groove. Sides of head steep. Chelicera longer than the width of the clypeus, about 1.75 times the height of the head in front, with 3 pairs of teeth. ♀ palpal claw with 4 teeth. Sternum longer than broad. Labium longer than broad, truncated apically, not one-half the length of the maxillæ. Anterior spinnerets longest. Legs rather slender, metatarsus of IV shorter than patella and tibia. Length of leg IV to cephalothorax, ♂ 4.1 : 1, ♀ 3.5 : 1.

	<i>Dimensions.</i>		♂	♀
Cephalothorax,			6.5	7.3
Abdomen,			7	10
Leg I,			22	21.5
Leg II,			20	19.8
Leg III,			19]	19
Leg IV,			26	26

Color (in alcohol).—*Cephalothorax* with a broad median buff band arising at the posterior eyes and extending back (becoming gradually broader) to just in front of the middle of the dorsum where it is as broad as the eye area; just in front of the dorsal groove it is deeply incised laterally, it expands around this groove (where it is broadest), it is notched behind the groove and from there continues back as a narrower band; this band usually contains two pairs of minute black spots in its anterior third. On each side of this median band is a deep brown or blackish band, in its middle wider than the median band and with lobed lateral margins; the posterior sides of the median band are edged with deep black. Each cheek has a buff submarginal mark, and the sides of the thorax have large submarginal marks of the same color and of irregular shape, separated by lines of blackish radiating from the dorsal groove. The anterior eye area is black; the extreme margin of

the thorax blackish. *Sternum* yellowish or reddish-brown, darker than the coxæ. *Abdomen* above deep brown or reddish-brown, on its anterior half a slightly darker median band which is widest at its anterior end, has a pair of short lateral diverticula at its middle, and terminates posteriorly in a transverse arc. On the posterior dorsum is a series of four transverse arches, which become posteriorly successively smaller, each in its anterior portion of the same color as the median band, but posteriorly narrowly edged with whitish. At each antero-lateral margin of the dorsum is a black mark of a U-shape, with the bend of the U directed medio-anteriorly, and on a line with each of these marks a row of four to six black spots which extend on each side of the dorsum back to the spinnerets; the first two of these spots are largest and always the most conspicuous, and sometimes all the spots of one line are connected so as to form a broken, longitudinal black line. The sides are deep brown mottled with spots of the same color as the median band. The venter has a band of yellowish extending from the epigastric slit to the spinnerets, which is in front almost as broad as the lung area but behind becomes slightly narrower; within this light band are two parallel longitudinal rows of small blackish spots, most distinct on the anterior half of the venter, and never extending back quite as far as the spinnerets. *Epigynum* deep reddish-brown. Spinnerets chocolate-brown. *Chelicera* deep reddish-brown or black, with black and white hairs, the macula pale red; *maxillæ* and *labium* lighter with yellowish tips. *Legs* distinctly banded above, less distinctly below, with black and buff on the femora, patellæ blackish proximally and buff distally, tibiæ blackish at the ends and buff at the middle, tarsi and metatarsi blackish.

Comparisons.—Cf. *L. insopita*.

Habits.—Abundant near Austin, under stones near water. The males most numerous in January.

***Lycosa insopita* n. sp.** Pl. XVIII, figs. 3, 4.

(Numerous specimens of both sexes from Austin, Texas.)

Eyes.—First row narrower than the second, but the middle points of its lateral eyes more lateral than the middle points of the eyes of the second row, nearer the second row than the clypeal margin, its middle eyes higher and larger than the lateral. Eyes of the second row largest in the ♀, slightly more than their diameter apart, not quite in the ♂. Third row widest, its eyes slightly more than their diameter behind the second row. Dorsal eye area less than one-fifth the length of the cephalothorax. Quadrilateral of the posterior eyes distinctly wider than long.

Form.—Cephalothorax in front truncated nearly straight, about one-half its greatest transverse diameter, highest at the posterior eyes (in the ♂ behind the middle), sides of the head steep. Chelicera longer than the clypeus wide, about 2.5 the height of the head in front, with three pairs of teeth. Sternum longer than broad. Labium longer than broad, more than one-half the length of the maxillæ, slightly concave apically. Spinnerets equal in length. Legs short, leg IV to cephalothorax in ♂ 3.6 : 1, in ♀ 3.2 : 1. ♀ palpal claw with 6 teeth.

	<i>Dimensions.</i>		♂	♀
Cephalothorax,			7.3	8
Abdomen,			6	10
Leg I,			24	22
Leg II,			22	20.5
Leg III,			20	20
Leg IV,			26.5	25.5

Color of ♀ (in alcohol).—*Cephalothorax* above dark reddish-brown, with a median paler red band arising at the second eye row, enlarging behind the eye area to a width equal to that of the second eye row, constricted deeply a little before the middle, enlarging again (to its greatest diameter) around the dorsal groove where its margins are dentated, and behind this groove terminating very narrow. There is a broad, interrupted submarginal band of the same color on each side. *Sternum* deep reddish-brown like the ventral surface of the coxæ. *Abdomen* above with a large black spot at the anterior end on each side of the mid-line, and from each of these spots a blackish, interrupted band passes back along the margin of the dorsum almost to the spinnerets; in the mid-line a series of five triangular and contiguous black markings, decreasing in size posteriorly, and the most anterior placed just anterior to the middle; the remainder of the dorsum is purplish-gray with minute black spots. The sides are finely mottled with purple-gray and brown; the whole venter black spotted laterally with brown, lung-books orange, *epigynum* deep reddish-brown, *spinnerets* brown. *Chelicera* black, *labium* and *maxillæ* the same but with light tips. *Legs* above and below distinctly annulated on all joints with black and yellowish. *Palpi* colored like the legs.

Color of ♂.—Like the ♀, except that the whole venter is black (with the exception of the lung-books); and that the abdominal dorsum has on each margin a broad band of black extending its entire length, the area between these brands being gray with transverse lines of black in its posterior half.

Comparisons.—This species comes closest to *L. euepigynata*, but differs from it in slightly shorter relative length of legs, in greater relative width of cephalothorax (in *insopita* less than one-quarter longer than broad, in *euepigynata* decidedly more than one-quarter), in the dark coloration of the venter, and in the structure of the genitalia. It differs also from *L. purcelli*, the epigynum of which is very similar, in the slightly greater relative length of the legs, in greater size, and markedly in the coloration.

Habits.—Less abundant than the preceding, and found in drier localities. They live under stones, where the female makes a shallow horizontal burrow lined with silk.

Lycosa antelucana n. sp. Pl. XVIII, figs. 5, 6.

(Numerous specimens from Austin, Texas.)

Eyes.—First row almost upon the clypeal margin, shorter than the second (but middle points of its lateral eyes as far lateral as middle points of eyes of the second row), its eyes equidistant, with the middle eyes decidedly larger and slightly higher than the lateral. Eyes of second row largest, almost or wholly their diameter apart. Third row little broader than the second, its eyes about 1.5 their diameter behind that row. Dorsal eye area about one-fifth the length of the cephalothorax. Quadrilateral of the posterior eyes nearly as long as broad.

Form.—Cephalothorax slender, in front truncated in ♂ and somewhat rounded in ♀, fully one-half its greatest transverse diameter (♀) or less (♂), highest at the posterior eyes with the sides of the head steep. Chelicera fully 2.3 times the height of the head in front, in the ♀ shorter than the width of the clypeus, with 3 pairs of teeth. Sternum longer than broad. Labium longer than broad, less than one-half the length of the maxillæ, apically truncated. ♂ palpal organ relatively small. Posterior spinnerets slightly longer than the anterior. Length of leg IV to cephalothorax, ♂ 4.1 : 1, ♀ 3.2 : 1. In the ♂, but not the ♀, the metatarsus IV is slightly longer than the patella and tibia combined. ♀ palpal claw with 4 teeth.

	Dimensions.	♂	♀ ♀
Cephalothorax,		6.8	6.5–8.5
Abdomen,		6.5	6.5–11
Leg I,		22.5	16.5–23
Leg II,		21	16–21.5
Leg III,		20.5	15.5–20
Leg IV,		28	21–29

Color of Females (in alcohol).—*Cephalothorax* pale brown, with a

median buff stripe (white at its anterior end) arising as a narrow band in the eye area, enlarging between this region and the dorsal groove, largest around the dorsal groove (where its greatest diameter about equals the width of the eye area), and narrowed again behind the dorsal groove. To each side of the anterior part of this band, parallel to it and median to each eye of the third row, is a much narrower buff line. From the dorsal groove deep brown lines radiate to a submarginal, dentated buff band. *Sternum* black. *Abdomen* above with a black-edged, brown median band which terminates bluntly about the middle of the dorsum and is laterally dentate; behind this band are three or four transverse arches, each blackish anteriorly and whitish posteriorly, and between these arches are black spots in transverse rows; the rest of the dorsum is yellowish spotted and streaked with dark brown. The sides are buff, the whole venter deep black. *Epigynum* reddish-black. *Chelicera*, *labium* and *maxillæ* deep blackish-red. *Legs* above yellowish, femora I and II with an indistinct darker longitudinal band on the median side, femora III and IV spotted with brownish, fourth pair of legs with a black ring at each end of the tibia and at the distal end of the metatarsus, these black markings being much more distinct on the ventral surface. Ventral surface of the coxæ brownish-yellow or deep black.

One female (the largest obtained) differed in coloration as follows: Cephalothorax chocolate-brown with the cheeks pale buff, this buff extending back as a narrow submarginal band to about the end of the anterior third of the cephalothorax, and succeeded by three to four indistinct buff spots.

Color of Males (in alcohol).—Differ from the females in that the median stripe on the abdominal dorsum is much more distinct, and with a buff band contiguous to each side of it. *Sternum*, *labium*, *maxillæ* and inferior surface of coxæ chocolate-brown.

Comparisons.—This species comes closest to *L. inhonesta* (Keys.), from which it differs: (1) In the first row of eyes being upon the clypeal margin; (2) in the head being relatively lower at the second row of eyes; (3) in the head of the female being rounded in front; (4) in the color of the abdominal dorsum; and (5) to some extent in the genitalia.

Habits.—Under stones, common in the autumn, but none found in the winter.

Lycosa mccooki n. sp. Pl. XVIII, fig. 11.

(Two females from Austin, Texas. Dedicated to Dr. Henry C. McCook, the eminent describer of the spinning habits of spiders.)

Eyes.—First row equidistant from the clypeal margin and the second row, its eyes adequal and its middle eyes decidedly higher, shorter than the second row. Eyes of second row much the largest, less than their diameter apart. Third row widest, its eyes nearly twice their diameter behind the second row. Dorsal eye area almost one-quarter the length of the cephalothorax. Quadrilateral of the posterior eyes broader than long. Third row scarcely wider than the second.

Form.—Cephalothorax in front about one-half its greatest transverse diameter, highest at the posterior eyes, sides of the head steep. Chelicera with three pairs of teeth, longer than the clypeus wide, their length barely 1.75 times the height of the head in front. Sternum longer than broad. Labium longer than wide, concave apically, about one-half the length of the maxillæ. Posterior spinnerets longest. Leg IV to cephalothorax as 4.2 : 1, its metatarsus shorter than the patella and tibia combined. Palpal claw with 4 teeth.

Dimensions.

Cephalothorax,	5
Abdomen,	5
Leg I,	15.5
Leg II,	15
Leg III,	15
Leg IV,	21

Color (in alcohol).—*Cephalothorax* brown or blackish, white between the eyes of the second row and a white line below each of these eyes. A median buff or reddish-brown band, almost as broad as the eye area, extends from the eye region along the whole length of the cephalothorax and is slightly constricted anterior to the dorsal groove. There is a narrow, undulating, buff submarginal band, and the extreme margin is black. *Sternum* brown or black, darker than the coxæ. *Abdomen* without a median band, a large whitish or pale yellow spot covers almost the anterior third of the dorsum, and behind it on the dorsum are 5-6 pairs of smaller spots of the same color, the posterior ones appearing as transverse stripes due to the confluence of their component spots; each row of these light markings is bordered laterally by a broad black stripe. Sides mottled with black or gray. Venter black in one specimen, mottled black and yellowish in the other. *Epigynum* yellow. *Chelicera* deep reddish-black, *labium* the same color with yellowish tip, *maxillæ* reddish-brown or yellowish. *Legs* with femora banded distinctly with brown and buff, and (most distinctly on the anterior pairs) with a longitudinal brown band on the posterior surface; the

posterior two pairs with the tibia blackish at the ends and yellow in the middle, the metatarsi yellow at the ends and blackish in the middle; each coxa below with an elongate yellow spot proximally.

Comparisons.—Most nearly related to *L. pictilis*, but they differ noticeably in epigynum and coloration.

Lycosa nigra Stone. Pl. XX, figs. 40, 41.

Lycosa nigra Stone, 1890.

Lycosa nigra Stone, Montgomery, 1902.

(Of this species, hitherto known only by the ♀, an adult ♂ and ♀ were loaned to me by Mr. J. H. Emerton, collected in Long Island, New York.)

Eyes.—First row shorter than the second, equidistant from the second row and the clypeal margin, straight, eyes equidistant, middle eyes slightly larger. Eyes of second row largest, almost 1.5 times their diameter apart. Eyes of third row fully twice their diameter behind the second row, this row scarcely broader than the second in the ♂, distinctly broader in the ♀. Dorsal eye are to length of cephalothorax as 1 : 4.75. Quadrilateral of the posterior eyes as broad as long in the ♂, broader than long in the ♀.

Form.—Cephalothorax in front rounded, almost one-half its greatest transverse diameter in the ♀, not one-third this width in the ♂, highest at the posterior eyes, sides of the head almost vertical in the ♂, more oblique in the ♀. Labium distinctly longer than broad, narrow, not quite one-half the length of the maxillæ, its sides almost parallel, obliquely truncated at the tip. Chelicera in length almost twice the height of the head in front, rather weak but arched anteriorly. Sternum large, much longer than broad, continued between the posterior coxæ. ♂ palpus almost as long as the cephalothorax. Legs rather stout, short, without scopulæ, with very few hairs and short spines. Anterior spinnerets longest. Leg IV to cephalothorax, 3.1 : 1; metatarsus IV shorter than patella and tibia combined.

	<i>Dimensions.</i>		♂	♀
Cephalothorax,			2.3	2.3
Abdomen,				2.8
Leg I,				5
Leg II,				4.5
Leg III,				4.3
Leg IV,			7.3	7.2

Color of Female (in alcohol).—Cephalothorax uniform shining black, hairless, with a reddish tone, clypeal margin a little lighter. *Sternum* the same color, also hairless. *Abdomen* above greenish-brown with a median yellow band on the anterior third, this band pointed at both

ends and narrowly edged with blackish; to each side of the mid-line is a row of about 6 small spots, the posterior ones connected by narrow transverse lines of the same color. The sides are greenish-brown, flecked ventrally with yellow. Venter yellow with a median and a pair of closely approximated lateral blackish, longitudinal bands which converge as they pass caudad, but are separated from the spinnerets by an area of the same color as the sides; the lateral dark bands diverge around the epigynum and at some distance from it, but unite anteriorly close to the peduncle. *Chelicera* dark reddish-black with few hairs, *labium* the same color with yellow tip, *maxillæ* brownish. *Legs* with the femora black (except for a yellow spot on the distal anterior surface of the first pair); coxæ and trochanters blackish above but lighter below; the other joints light yellow, patellæ and tibiæ of the first three pairs blackish below, fourth pair with the patella blackish below and the tibia with a blackish ring at each end and extending to the dorsal surface. *Palpi* with femora black, other joints yellow with some blackish ventrally.

Color of Male (in alcohol).—*Cephalothorax* hairless, shining dark brown, a black stripe between the second and third eyes of each side. *Sternum* shining brown. *Abdomen* above with the median band bordered with small black dots, and enclosed in a broader bright yellow area which in its posterior two-thirds contains on each side a row of about 7 small black spots, each row more lateral than the median band, and the two rows meeting at the spinnerets. The sides are blackish, flecked with yellow. The venter is like that of the female, but the median dark band is lacking. *Legs* with femora darkest, these being greenish-brown, as are the trochanters; coxæ yellow proximally; the other joints pale yellow without dark markings. *Palpi* greenish, the ventral surface of the patella and the distal end of the tarsus yellow.

Comparisons.—This species is to be distinguished from *L. rugosa* (Keys.), another small species with hairless cephalothorax, in the structure of the palpal organ; in the wide separation of the eyes of the second row; in the chelicera being considerably longer than the first patellæ and arched in front; and in the different color of the abdominal venter. Hentz's *L. funerea* may be one of these species, but his description and figure gives so insufficient a diagnosis that it is doubtful whether *funerea* can ever be recognized with certainty.

***Lycosa charonoides* Montg.**

Lycosa charonoides Montgomery, 1902, 1903.

(Specimens from Pennsylvania.)

Eyes.—First row as broad as the second (♂) or shorter (♀), straight,

nearer the clypeal margin than to the second row, middle eyes not quite double the size of the lateral. Eyes of second row largest, their diameter apart (σ) or slightly more (φ). Length of the dorsal eye area to the cephalothorax, σ 1 : 6, φ 1 : 5.5. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax highest behind the middle (σ) or equally high there and at the posterior eyes (φ), its posterior declivity abrupt and steep, in front truncated straight and less than one-half its greatest transverse diameter. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, their length fully twice the height of the head in front. Labium longer than broad, truncated apically, not one-half the length of the maxillæ. Sternum longer than broad, with few hairs, pointed posteriorly. Leg IV to cephalothorax, σ 3.5 : 1, φ 3.8 : 1; metatarsus IV shorter than patella and tibia combined. φ palpal claw with 3 teeth.

***Lycosa lepida* (Keys.).**

Tarentula lepida Keyserling, 1876.

Lycosa communis Emerton, 1885.

Tarentula lepida Keys., Marx, 1889.

Lycosa communis Emerton, Stone, 1890.

Lycosa lepida (Keys.), Montgomery, 1902, 1903.

(Numerous specimens from Pennsylvania, New Jersey, Massachusetts, Texas.)

Eyes.—First row nearer to the clypeal margin than to the second row, its eyes equidistant, middle eyes larger and slightly higher. Eyes of the second row largest, more than their diameter apart. Length of dorsal eye area to cephalothorax as 1 : 5.5. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front truncated and fully (φ) one-half or less (σ) its greatest transverse diameter, the sides of the head rather steep. Chelicera with 3 pairs of teeth, as long as the width of the clypeus, their length more than twice the height of the head in front. Labium longer than broad, truncated apically, not one-half the length of the maxillæ. Sternum longer than broad. Spinnerets equal in length. Length of leg IV to cephalothorax, σ 4.2 : 1, φ 3.3 : 1; in the σ metatarsus IV is almost as long as the patella and tibia combined, but shorter in the φ . φ palpal claw with 4 teeth.

***Lycosa pictilis* Emerton. Pl. XVIII, figs. 7, 8.**

Lycosa pictilis Emerton, 1885.

(σ , φ , Mt. Washington, New Hampshire.)

Eyes.—First row shorter than the second, straight, eyes adequal,

equidistant from the second row and the clypeal margin. Eyes of second row largest, about 1.5 times their diameter apart. Dorsal eye area to cephalothorax, 1 : 5 (♀) or 1 : 5.5 (♂). Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front truncated straight and more (♀) or less (♂) than one-half its greatest transverse diameter. Chelicera large, with 3 pairs of teeth, longer than the width of the clypeus, their length fully 2.5 times the height of the head in front. Labium slightly longer than broad, truncated apically, not one-half the length of the maxillæ. Sternum longer than broad, pointed behind. Spinnerets about equal in length. Length of leg IV to cephalothorax, ♂ 3.5 : 1, ♀ 3.3 : 1; metatarsus IV shorter than patella and tibia combined. ♀ palpal claw with 7 teeth.

***Lycosa punctulata* Hentz.**

Lycosa punctulata Hentz, 1841.

Lycosa punctulata Hentz, Emerton, 1885.

nec *Lycosa punctulata* Hentz, Stone, 1890.

(Two females from Philadelphia, Pennsylvania.)

Eyes.—First row shorter than the second, nearly straight, nearer the clypeal margin than the second row, middle eyes slightly larger and nearer the lateral eyes than to each other. Eyes of second row largest, their diameter apart. Dorsal eye area to cephalothorax as 1 : 5.5. Quadrilateral of the posterior eyes longer than wide.

Form.—Cephalothorax highest at the posterior eyes, in front truncated and a little more than one-half its greatest transverse diameter, the sides of the head rather steep. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, about one and four-fifths times the height of the head in front. Labium large, nearly as broad as long, slightly concave apically, not one-half the length of the maxillæ. Spinnerets about equal in length. Length of leg IV to cephalothorax as 3.4 : 1; metatarsus IV shorter than patella and tibia combined. Palpal claw with 5 teeth.

***Lycosa ocreata* Hentz.**

Lycosa ocreata Hentz, 1841.

Lycosa ocreata Hentz, Emerton, 1885.

Lycosa stonei Montgomery, 1902, 1903.

nec *Lycosa rufa* Keyserling, 1876.

(Numerous specimens from Pennsylvania, New Jersey, Massachusetts, and Long Island, New York.)

Eyes.—First row narrower than the second, a little nearer the clypeal margin than to the second row, middle eyes slightly larger and higher. Eyes of second row largest, 1.5 times their diameter apart. Dorsal

eye area to cephalothorax as 1 : 4.3. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front one-half its greatest transverse diameter (♀) or one-third (♂), sides of head vertical (♂) or slightly oblique (♀), the anterior eye row over-arching the clypeus. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, in length 1.5 times the height of the head in front, weak and but slightly arched anteriorly. Labium slightly longer than wide, somewhat rounded apically, not one-half the length of the maxillæ. Sternum longer than broad, pointed posteriorly. Anterior spinnerets longer than the posterior. Leg IV to cephalothorax as 4.7 : 1; metatarsus IV as long as tibia and patella combined. ♀ palpus with 4 teeth. Tibia I of ♂ with a brush of long stiff hairs.

***Lycosa scutulata* Hentz.**

Lycosa scutulata Hentz, 1841.

Lycosa scutulata Hentz, Emerton, 1885.

Lycosa scutulata Hentz, Stone, 1890.

Lycosa scutulata Hentz, Montgomery, 1902.

(Numerous specimens from New Jersey, Pennsylvania, and Austin, Texas.)

Eyes.—First row narrower than the second, equidistant from the clypeal margin and the second row, straight or the middle eyes slightly higher, middle eyes a little larger than the lateral. Eyes of second row largest, fully (♂) or not quite (♀) their diameter apart. Length of dorsal eye area to cephalothorax, ♂ 1 : 4.75, ♀ 1 : 5. Quadrilateral of the posterior eyes longer than wide.

Form.—Cephalothorax highest at the posterior eyes, in front truncated and almost (♀) or less than (♂) one-half its greatest transverse diameter, sides of head steep, first two eye rows overarching the clypeus. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, their length 1.75 times the height of the head in front. Labium longer than broad, widest at the distal half, apically truncated, not one-half the length of the maxillæ. Sternum distinctly longer than broad. Superior spinnerets slightly longer. Length of leg IV to cephalothorax, ♂ 4.7 : 1, ♀ 4.1 : 1; metatarsus IV slightly longer (♂) or slightly shorter (♀) than the patella and tibia combined. ♀ palpal claw with 4 teeth.

Remarks.—The Texas specimens differ from the northern ones in greater size, the ♀ with a cephalothoracal length of 12 mm.

***Lycosa bilineata* (Emerton).**

Pardosa bilineata Emerton, 1885.

Lycosa ocreata pulchra Montgomery, 1902.

(Numerous specimens from Pennsylvania, New Jersey and Massachusetts.)

Eyes.—First row shorter than the second, about equidistant from the clypeal margin and the second row, the middle eyes almost contiguous, larger and slightly higher than the lateral. Eyes of the second row largest and about 1.4 their diameter apart. Length of dorsal eye to cephalothorax as 1 : 4.5. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front truncated straight and decidedly less than one-half its greatest transverse diameter, the sides of the head vertical and the two anterior rows projecting in front of the clypeus. Chelicera weak with 3 pairs of teeth, their anterior margin nearly straight, longer than the width of the clypeus, their length about 1.5 times the height of the head in front. Labium longer than broad, apically truncated, not one-half the length of the maxillæ. Sternum large, longer than broad. Spinnerets equal in length. Metatarsus IV shorter than patella and tibia combined; length of leg IV to cephalothorax, ♂ 4 : 1, ♀ 3.8 : 1. ♀ palpal claw with 3 teeth. Tibia I in ♂ with a thick brush of vertical hairs.

Remarks.—Emerton's description of *bilineata* was so brief, that I did not consider it to be identical with my *ocreata pulchra* until Emerton called my attention to the probable identity; Emerton had described only the female.

***Lycosa inhonesta* (Keys.). Pl. XX, figs. 38, 39.**

Tarentula inhonesta Keyserling, 1876.

?*Lycosa babingtoni* Blackwall, 1846.

Lycosa nidicola Emerton, 1885.

Lycosa nidicola Emerton, Stone, 1890.

Lycosa nidicola Emerton, Montgomery, 1902, 1903

Lycosa tigrina McCook, 1878, 1893 (Plate 30).

Lycosa tigrina McCook, Stone, 1890.

?*Lycosa vulpina* Emerton, 1885.

Lycosa inhonesta (Keys.), Montgomery, 1902.

(Numerous specimens from Massachusetts, Pennsylvania, New Jersey and Austin, Texas.)

Eyes.—First row nearer to the clypeal margin than to the second row, shorter or quite as long as the second, middle eyes higher and slightly larger. Eyes of the second row much the largest, about three-fourths their diameter apart. Eyes of the third row about twice their diameter behind the second row. Dorsal eye area about one-sixth

the length of the cephalothorax. Quadrilateral of the posterior eyes wider than long.

Form.—Cephalothorax highest just behind the third eyes, in front slightly rounded and about one-half its greatest transverse diameter. Sides of head oblique. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, their length 2.5 times the height of the head in front. Sternum longer than broad. Leg IV to cephalothorax, ♂ 4 : 1, ♀ 3.4 : 1; metatarsus IV shorter than patella and tibia combined. ♀ palpal claw with 3 teeth. Spinnerets about equal in length. Legs stout with weak scopulæ.

Remarks.—The Texas specimens offer as great variation in size and color as do the northern ones (cf. Montgomery, 1903). Under stones in the bed of Shoal Creek, at Austin, where they are very numerous, two series of individuals may be distinguished:

(1) Smaller ones of lighter color. Cephalothorax with the light submarginal band as distinct as the median. Abdomen above with a pale brown to orange median band extending the whole length of the dorsum, and enclosing in its anterior half a narrower darker band edged with black; each side of the dorsum is darker with a row of whitish spots that are frequently connected by transverse white lines; venter pale brown, unspotted or with small spots. Sternum and coxæ darker brown to reddish-brown. Legs greenish or yellowish with darker annulations. Cephalothoracal length (♀) 7.5–8.5 mm.

(2) Larger ones of darker color. Cephalothorax with the submarginal bands frequently interrupted or indistinct. Abdomen very dark above and with the pattern indistinct; venter frequently blackish, with numerous small black spots which are sometimes arranged in longitudinal rows; rarely the entire venter is deep black. Sternum and inferior surface of coxæ reddish-brown to deep black. Legs dark brown with more or less distinct darker annulations; leg IV sometimes shows on the inferior surface deep black rings at both ends of the tibia and at the distal end of the tarsus. Cephalothoracal length (♀) 8.5–11.5 mm.

The intermediates between these two groups are not very numerous. The most constant color diagnostic is the very narrow light median band of the cephalothorax.

This species is so variable that without a large series of individuals one might easily conclude that it included two species, namely, a smaller one (*nidicola* of Emerton) and a larger and darker one, with distinct annulations on the legs (*inhonesta* of Keyserling, *tigrina* of McCook). But there are no valid distinctions in the genitalia of the

two, and they intergrade in size and color, so that I have concluded to regard them as one species. It is possible that Emerton's *vulpina* is a color variety of this species; but of *vulpina* I have seen only an adult male (labelled so by Mr. Emerton), and no adult female, so that I could not decide the point.

Habits.—This is a species of moist ground and meadow land, and at Austin is very abundant under stones on the margin of Shoal Creek. The males and the young are more or less diurnal, the grown females nocturnal.

Lycosa relucens Montg.

Lycosa relucens Montgomery, 1902.

Lycosa verisimilis Montgomery, 1902, 1903.

(Specimens from Pennsylvania, New Jersey, and Austin, Texas.)

Eyes.—First row straight, narrower than the second, nearer to the clypeal margin than to the second row, eyes adequal in size. Eyes of second row largest, about 1.5 times their diameter apart. Length of the dorsal eye area to the cephalothorax, ♂ 1 : 4.5, ♀ 1 : 5. Quadri-lateral of the posterior eyes broader than long.

Form.—Cephalothorax highest at the posterior eyes, in front truncated and not one-half its greatest transverse diameter, sides of the head nearly vertical (♂) or more oblique (♀), anterior margin of the head projecting slightly in front of the clypeus. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, their length about twice the height of the head in front. Labium longer than broad, apically rounded (♀) or truncated (♂), not one-half the length of the maxillæ. Sternum large, longer than broad. Length of leg IV to cephalothorax as 4 : 1, metatarsus IV shorter than the patella and tibia combined. Spinnerets equal in length. ♀ palpal claw with 3 teeth.

Remarks.—The very considerable variation in the form of the epigynum led me originally to divide this into two species. Recently I have obtained individuals with the epigynum quite intermediate in structure between the extremes first found. The specimens from Texas are larger than the northern ones.

GEOLYCOSA nov. gen.

I propose this new genus for those species, previously included in *Lycosa*, in which the first leg is thickest and strongest, furnished with thick scopulæ on its three terminal joints, and almost as long as the fourth (shorter by not more than one-half the length of tarsus I). *Geolycosa latifrons* is the type species.

In *Geolycosa latifrons* the cephalothorax is very high in the cephalic

portion, and from that point to its posterior margin its dorsal contour is almost straight without any demarcation of a posterior declivity; the posterior declivity is only slightly marked in *arenicola* and *carolinensis*, but well marked in *baltimoriana* and *texana*. In *latifrons* also the chelicera are very large and thick. The first row of eyes is about as broad as the second, except in *texana*. The other characters are essentially those of *Lycosa*.

This genus is better demarcated from *Lycosa* than either *Pardosa* or *Trochosa*. All the species dig deep cylindrical holes in the ground, and some of them build a low turret of sticks around the aperture (*arenicola*, *latifrons*, *texana*). This burrowing habit has occasioned the thickness of the first pair of legs, and occasioned also the height of the cephalothorax in front by the greater development of the muscles there. *Lycosa fatifera* Hentz probably belongs to this genus, but Hentz's very brief description: "Bluish black; cephalothorax deeper in color at the sides; chelicera covered with rufous hairs and with a red elevation on their external side near the base; one of the largest species," is insufficient. He states it "is common in Massachusetts," and this, together with his description of its tube, makes it possible that he had either a light variety of *carolinensis* or an unusually large and dark specimen of *arenicola*.

KEY TO SPECIES OF GEOLYCOSA.

- a. 1.—Lateral eyes of the first row larger than its middle eyes, whole venter deep black, *carolinensis*.
- a. 2.—Lateral eyes of the first row not larger than its middle eyes, whole venter not black.
 - b. 1.—Patellæ black below, almost the whole venter behind the lung-books deep black, this black not including lighter markings, *baltimoriana*.
 - b. 2.—Not so colored.
 - c. 1.—First eye row distinctly shorter than the second, posterior declivity of cephalothorax describing an angle with the dorsal contour, *texana*.
 - c. 2.—First eye row fully as broad as the second, posterior declivity of the cephalothorax in a line with its dorsal contour.
 - d. 1.—Coxæ and femora of legs I and II black below, venter with a median black band, *arenicola*.
 - d. 2.—Not so colored, *latifrons*.

Geolycosa texana n. sp. Pl. XVIII, figs. 13, 14.

(Numerous specimens from Austin, Texas.)

Eyes.—First row nearer the second than the clypeal margin, de-

cidedly shorter than the second, its eyes subequal, middle eyes slightly higher. Eyes of second row largest, less than their diameter apart. Third row widest. Dorsal eye area less than one-fifth the length of the cephalothorax. Quadrilateral of the posterior eyes longer than broad.

Form.—Cephalothorax in front truncated, about one-half its greatest transverse diameter (♀) or less (♂), highest at the posterior eyes, the ocular region marked off by a groove from the cheek region. Sides of head rather steep. Chelicera massive, much longer than the clypeus wide, their length nearly twice the height of the head in front, with 3 pairs of teeth; their posterior surface with a row of numerous transverse striæ. Sternum longer than broad. Legs long but strong, length of the fourth to the cephalothorax in ♂ 4.1 : 1, in ♀ 3.6 : 1; in the ♂ the fourth metatarsus is slightly longer than the patella and tibia combined. ♀ palpal claw with 6 teeth. Anterior spinnerets longest and largest. Labium longer than broad, fully one-half the length of the maxillæ, apically truncated. Epigynum relatively small.

	<i>Dimensions.</i>		♂	♀
Cephalothorax,			11	13.5
Abdomen,			11	14
Leg I,			40.5	43
Leg II,			37.5	40
Leg III,			34	36
Leg IV,			45	49

Color in Life.—*Cephalothorax* above grayish-black, with a grayish median band that occupies the whole surface between the eyes of the second and third rows, passes back to almost the middle of the cephalothorax, there becomes narrower and continues to the posterior margin. Extreme margin black. There is an interrupted submarginal gray band which is continued on to the cephalic portion. All the gray markings are due to long whitish hairs, and finer whitish hairs are scattered over the blackish regions. *Sternum* thickly covered with long, stiff, grayish hairs, sometimes black on the margins. *Abdomen* above on its anterior half with a median band of dark brownish edged narrowly with black and containing minute black spots; this band terminates truncated about the middle of the dorsum, and on each side of it at about its middle is a pointed black spot. This band lies in a less distinctly defined, broader pale brownish band which extends the whole length of the dorsum and becomes much narrower toward the spinnerets. In this broader band, behind the narrower enclosed darker one, are about 6-7 crescentic transverse markings each as wide as the broad

band, each black anteriorly and white posteriorly, the most anterior being the most distinct; at each end of each of these crescentic markings is a large pale gray spot. Sides above dappled gray and blackish, below with larger black spots scattered on a gray or yellow ground. Venter in front of epigynum gray or yellow with a single pair of black spots. Just behind the rima epigastrica is a broad, transverse black band the anterior edge of which is straight and sharply demarcated, but the posterior edge of which is extended backward as a more or less interrupted median black band extending to a little in front of the spinnerets, and a pair of lateral black bands (or rows of black spots) which curve backward to meet the median band just in front of the spinnerets; thus the venter appears to possess a pair of elongate yellow or yellowish-gray areas, separated by the median black band, bordered laterally and posteriorly by the lateral black lines, and anteriorly by the transverse black band. *Spinnerets* blackish. *Chelicera* anteriorly with orange and black hairs, the macula red; *maxillæ* reddish-brown, *labium* darker. *Legs* above grayish with one or two black spots on the coxæ and black longitudinal markings on the posterior aspect of the femora; below each coxa is whitish, sometimes with a longitudinal black stripe, each femur whitish with a black ring at its distal end, each patella whitish, the first tibia blackish its entire length, the tibiæ of the other pairs whitish in the middle and black at the ends, the tarsi and metatarsi black. *Palpi* grayish, unmarked except that the terminal joint is black on the inferior surface.

Comparisons.—This large and beautiful species is quite distinct from any other. It is very abundant in open areas of the limestone region of Austin, and lives in deep cylindrical holes lined with silk, and with the opening of the tube raised above the surface of the ground, as in *G. arenicola*.

***Geolycosa latifrons* n. sp.** Pl. XIX, figs. 15-18.

(Specimens from the vicinity of Austin, Texas.)

Eyes.—First row much nearer the second row than to the clypeal margin, almost or fully as broad as the second row, its middle eyes slightly larger and higher, and nearer the lateral eyes than each other. Eyes of second row largest, separated by almost their diameter. Third row broadest, about 1.5 times the diameter of one of its eyes behind the second row. Dorsal eye area to cephalothorax as 1 : 6.5. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax very broad in front, there from five-eighths (♂) to four-fifths (♀) its greatest transverse diameter, very high at the posterior eyes and from there gradually sloping to its posterior

end, the posterior declivity not being separable from the dorsal outline. It is very high at the posterior eyes, and the cephalic portion is marked off from the thoracal on each side by a groove; the sides of the head are oblique and the cheeks very broad. Chelicera massive with a large macula basalis, with three pairs of teeth, longer than clypeus wide, in length about 2.5 times the height of the head from the clypeal margin to the superior border of the second eye row, at the base almost as thick in an antero-posterior direction as one-half their length. Sternum much longer than broad. Labium longer than wide, not one-half the length of the maxillæ, apically concave. Posterior spinnerets longest. Epigynum very large. First leg noticeably thicker than the others, particularly its three terminal joints which are thickly covered below with scopulæ. Scopulæ are also present upon the tarsus, metatarsus and distal half of the tibia of II, and on the tarsi of III and IV. Fourth leg to cephalothorax, ♂ 3.3 : 1, ♀ 2.7 : 1. Metatarsus IV shorter than patella with tibia combined.

	<i>Dimensions.</i>		♂	♀
Cephalothorax,			8.5	10
Abdomen,			7	8
Leg I,			27	25.5
Leg II,			24.5	22
Leg III,			22	20.5
Leg IV,			28.3	27

Color of Females (in alcohol).—*Cephalothorax* with few and only short hairs; clear to dark reddish-brown in the cephalic portion, this clear area constricting anterior to the dorsal groove, then enlarging again around this groove; sides darker, interrupted by reddish bands radiating from the dorsal groove, the extreme margin black. *Sternum* yellow to yellowish-gray. *Abdomen* above dull brown to chocolate-brown without any distinct pattern on the dorsum; at each antero-lateral angle a large elongate black spot; sides behind this mark paler brown; venter very pale yellow along its whole extent, or else a little darker behind the rima epigastrica. *Epigynum* clear reddish-brown. *Spinnerets* brown. *Chelicera* and *labium* dark reddish-brown, *maxillæ* yellowish. *Legs* without annulations, above reddish-brown (usually paler than the light portion of the cephalothorax), below the coxæ, femora and patellæ lighter (of the same color as the sternum); owing to the thick scopulæ the inferior surfaces of the tibiæ, metatarsi (also the dorsal portion of the distal half of these), and the tarsi of I are black, as of the tibia, metatarsus and distal half of the tibia of II, and of the distal ends of the tarsi of III and IV.

Color of Males (in alcohol).—Differ from the female as follows: The *abdomen* above is orange-brown (more clear orange anteriorly); at each antero-lateral angle arises a broad black band that extends on the side posteriorly as far as the middle; venter pale brownish laterally, the median region behind the lung-books being silvery with a pair of closely approximated narrow, darker longitudinal lines. The *coxæ* and *femora* are greenish below. *Palpi* with all the joints brown above and greenish below, except the tarsus, which is wholly black.

Comparisons.—A species very well marked by the great width of the head region, and the gradual slope of the dorsal contour of the cephalothorax.

Geolycosa baltimoriana (Keys.). Pl. XIX, fig. 19.

Tarentula baltimoriana Keyserling, 1876.

Lycosa baltimoriana (Keys.), Montgomery, 1902.

(In addition to the single male originally described by me, I have secured three additional males from the vicinity of Austin, Texas.)

Eyes.—First row nearer the clypeal margin than the second row, almost as broad as the second, its eyes equidistant, the middle eyes higher and fully twice the size of the lateral. Eyes of the second row largest, about three-fourths their diameter apart. Third row broader than the second, its eyes almost 1.5 their diameter behind the second row. Dorsal eye area one-fifth the length of the cephalothorax. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax in front quite one-half its greatest transverse diameter, highest at the posterior eyes, the posterior declivity inclined at fully 45° with the dorsal outline. Head rather oblique and rounded. Chelicera longer than the clypeus broad, almost twice the height of the head in front, with three pairs of teeth. Labium longer than broad, apically concave, less than one-half the length of the maxillæ. Sternum longer than broad. Spinnerets adequal in length. Legs long and slender, the first slightly thicker than the other (most noticeably its tibia), and shorter than the fourth by only one-third the length of its tarsus. Metatarsus IV shorter than patella and tibia combined. On all the femora the hairs are short and few; there are thick scopulæ on the tarsi and metatarsi of I and II, and on the tarsi of III and IV. Leg IV to cephalothorax as 3.5 : 1.

	<i>Dimensions.</i>	♂
Cephalothorax,	9
Abdomen,	7
Leg I,	29.5
Leg II,	28

	<i>Dimensions.</i>	♂
Leg III,		26
Leg IV,		31.5

Color (in alcohol).—*Cephalothorax* above with a very narrow white median line in the eye area extending back to the dorsal groove; the extreme margin white; a broad submarginal band of orange on each side, not extending to the head; a small reddish-yellow area around the dorsal groove (and extending back to the posterior margin of the thorax as a narrow band), from which broad radiating bands extend to the submarginal band, about four of these bands on each side, and each band narrowly white in front, black behind this, then reddish-brown in its posterior half. The ocular area is blackish; the clypeus and cheeks whitish above, postero-ventral margin of each cheek with a black spot. *Sternum* deep black. *Abdomen* above on its anterior half with a broad median dark band edged with black, this band narrowest anteriorly with sinuate margins and concavely truncated posteriorly; it is bordered by orange-brown. At each antero-lateral margin of the dorsum arises a broader, interrupted black stripe which extends almost to the spinnerets, and in its posterior half is simply an area of black spots. Behind the median band is a series of four narrow, transverse black bands, whose lateral margins confluesce with the lateral black stripes. Sides orange-brown, marked posteriorly with blackish spots. Venter pale greenish, with a sharply bounded, deep black band extending from the rima epigastrica in front to a little anterior to the spinnerets behind, this black covering the whole venter behind the lungs but not extending up the sides. *Chelicera* black with orange hairs anteriorly, *labium* and *maxillæ* black with paler tips. *Legs* above yellowish, femora of I and II with two almost contiguous, parallel dark lines above, and another on the posterior aspect, these represented by lines of black spots on III and IV; the patellæ and distal ends of the tibiæ are brownish, the metatarsi and tarsi of I and II pale brownish. Below the coxæ are chocolate-brown, the femora very pale yellow, the patellæ and distal ends of the tibiæ deep black, the metatarsi and tarsi reddish-brown. *Palpi* yellow, femora above with two longitudinal darker stripes, patella below slightly darker than above, whole tarsus almost black.

Comparisons.—Of all the species of the genus it comes closest to *texana*, but apart from the differences in coloration and the palpal organ it may be distinguished by tarsus I being more than one-half the length of the metatarsus, while in *texana* this joint is decidedly less than one-half this length.

Habits.—The female is unknown. One male was found in a hole three inches deep below a stone, the other two below stones, but not in holes.

***Geolycosa arenicola* (Scudd.).**

Lycosa arenicola Scudder, 1877.

Lycosa nidifex Marx, 1881.

Lycosa nidifex Marx, Emerton, 1885.

Lycosa arenicola Scudder, Stone, 1890.

Lycosa domifex Hancock, 1899.

Lycosa arenicola McCook, 1893 (Plate 30).

Lycosa arenicola Scudder, Montgomery, 1902.

(Numerous specimens from New Jersey, Massachusetts, and Long Island, New York.)

Eyes (♀).—First row as broad as the second, nearer the second row than to the clypeal margin, its eyes equidistant, the middle eyes slightly larger and slightly higher. Eyes of the second row largest, about their diameter apart. Dorsal eye area one-sixth the length of the cephalothorax. Quadrilateral of the posterior eyes broader than long.

Form (♀).—Cephalothorax highest at the posterior eyes and from there gradually declining to its posterior margin, with the posterior declivity barely demarcated from the dorsal, sides of the head oblique, in front somewhat rounded and about three-fifths its greatest transverse diameter. Chelicera with 3 pairs of teeth, their length almost twice the height of the head in front, longer than the width of the clypeus, at their base almost as thick antero-posteriorly as one-half their length. Thick scopulæ inferiorly upon the four terminal joints of legs I and II, and the two terminal joints of III and IV; leg IV to cephalothorax as 2.7 : 1; metatarsus IV shorter than patella and tibia combined.

***Lycosa carolinensis* Walck.**

Lycosa tarentula carolinensis Walckenaer, 1837.

Lycosa tarentula carolinensis Hentz, 1841.

Lycosa carolinensis Hentz, Emerton, 1885.

Lycosa carolinensis Walck., Stone, 1890.

Lycosa carolinensis Walck., Montgomery, 1902.

(Specimens from New Jersey, Pennsylvania and Martha's Vineyard, Massachusetts.)

Eyes.—First row equidistant from the clypeal margin and the second row, somewhat shorter than the second, the lateral eyes slightly lower and slightly larger than the middle and placed upon tubercles so that they are directed downward. Eyes of second row largest, not quite their diameter apart. Dorsal eye area to the length of the cepha-

lothorax as 1 : 6. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax flat and broad, the cephalic portion clearly marked off from the thoracic, in front fully (♀) or less (♂) than one-half its greatest transverse diameter, highest at posterior eyes; in the ♀ the dorsal outline gradually declines to the posterior margin with a posterior declivity only slightly defined, but in the ♂ the posterior declivity is well marked from the dorsal outline. Chelicera massive, their length more than twice the height of the head in front, longer than the width of the clypeus, with 3 pairs of teeth. Labium longer than wide, broadest at the tip where it is truncated, one-half the length of the maxillæ. Sternum longer than broad. Posterior spinnerets longest. Legs thick, length of leg IV to cephalothorax, ♂ 3.6 : 1, ♀ 3.2 : 1; metatarsus IV shorter than patella and tibia combined.

Genus **TROCHOSA** C. Koch, 1848.

This genus is most closely allied to *Lycosa*, and differs from it mainly in the following characters: The first row of eyes is fully as wide as the second, or at least (as in *avara* and *contestata*) the middle points of the lateral eyes of the first row are as far lateral as the middle points of the eyes of the second row; the sides of the head are obliquely arched, and the cephalothorax highest at or behind the middle (except in the ♀ of *frondicola*); the legs are usually comparatively short (only in *cinerea* has leg IV a length of four times the cephalothorax), and their spines are usually short (in *rubicunda* there is only one ventral spine on tibia I). The posterior spinnerets are never longer, usually shorter than the anterior. Metatarsus IV is always shorter than the patella and tibia combined. The chelicera are robust and arched anteriorly, with 3 teeth on their posterior margins (4 in *contestata*), and their length is fully twice the height of the head in front. The length of the dorsal eye area to the cephalothorax varies from 1 : 4.5 (*cinerea*) to 1 : 9 (*rubicunda*). The labium is longer than wide, and frequently one-half or more the length of the maxillæ (*sepulchralis*, *frondicola*, *purcelli*, *cinerea*).

There is a greater structural difference between *Trochosa rubicunda* and *Lycosa scutulata*, than between the latter and *Pardosa*; so that if we maintain the genus *Pardosa* we must also retain *Trochosa*.

KEY TO SPECIES OF TROCHOSA.

- a. 1.—Dorsal eye area one-ninth the length of the cephalothorax, one spine on the ventral surface of tibia I, . . . *rubicunda*.

- a.* 2.—Dorsal eye area at least one-seventh the length of the cephalothorax, 3 pairs of spines on the ventral surface of tibia I.
- b.* 1.—Posterior margin of chelicera with 4 teeth, . . . *contestata*.
- b.* 2.—Posterior margin of chelicera with 3 teeth.
- c.* 1.—Cephalothorax smooth, without hairs or with hairs only in the ocular area.
- d.* 1.—A distinct broad median and narrow submarginal bands on the cephalothorax, . . . *noctuabunda*.
- d.* 2.—Cephalothorax without stripes, . . . *sublata*.
- c.* 2.—Cephalothorax with hairs.
- d.* 1.—Median band of cephalothorax narrow, *helvipes* Keyserling, 1876.
- d.* 2.—Median band of cephalothorax on the anterior half about as broad as the ocular area, colors mainly gray and white, . . . *cinerea*.
- d.* 3.—Median band of cephalothorax in its anterior half about half as broad as the eye area, colors dark.
- e.* 1.—Median band of cephalothorax not laterally notched anterior to the median groove.
- f.* 1.—Venter pale brown, sternum not darker than the coxæ, . . . *avara*.
- f.* 2.—Venter black or blackish, sternum darker than coxæ, . . . *frondicola*.
- e.* 2.—Median band of cephalothorax notched laterally anterior to the median groove.
- f.* 1.—Legs (at least the femora) distinctly annulated, venter and sternum not deep black.
- g.* 1.—Spines on the femora shorter than the greatest diameter of the femora, . . . *pratensis*.
- q.* 2.—Spines on the femora longer than the greatest diameter of the femora, *purcelli*.
- 2.—Legs not annulated, venter and sternum deep black, . . . *sepulchralis*.

Trochosa noctuabunda n. sp. Pl. XVIII, figs. 9, 10.

(Several specimens from Austin, Texas.)

Eyes.—First row nearer the second than to the clypeal margin, straight, fully as broad as the second, the middle eyes nearly double the size of the lateral. Eyes of second row largest, separated by about 1.3 times their diameter. Third row little broader than the second, and almost twice the diameter of one of its eyes behind the second. Dorsal eye area less than one-sixth the length of the cephalothorax. Quadrilateral of the posterior eyes about as long as broad.

Form.—Cephalothorax in front in the ♂ rather pointed and about

two-fifths its greatest transverse diameter, in the ♀ somewhat rounded and slightly more than one-half this diameter, highest at or slightly in front of the middle, entirely smooth except for a few long hairs in the ocular area. Head low and oblique on the sides. Chelicera massive with strong macula basalis, very strongly arched on the anterior border, longer than the width of the clypeus, in length about twice the height of the head in front, with 3 pairs of teeth. Sternum decidedly longer than broad, rather pointed posteriorly. Labium fully one-half as long as the maxillæ, longer than broad, truncated straight. Anterior spinnerets slightly the longest. Legs short and stout with short spines; vertically inserted, longer, fine hairs are particularly noticeable on the tibiæ and metatarsi; length of leg IV to cephalothorax, ♂ 3.8 : 1, ♀ 3.5 : 1; metatarsus IV shorter than patella and tibia combined. ♀ palpal claw with 4 teeth.

Dimensions.

	♂	♀
Cephalothorax,	3.4	4 (3 in smallest)
Abdomen,	3.3	5
Leg I,	9.2	10.3
Leg II,	8.8	9.8
Leg III,	8.2	9.3
Leg IV,	13	14

Color (in alcohol).—*Cephalothorax* above blackish or deep brown in the eye area, with a yellowish spot postero-lateral to each posterior eye. A median yellow band arises between the posterior eyes, just behind them enlarges to a width slightly broader than that of the ocular area, is deeply constricted in front of the dorsal groove, enlarged to its greatest diameter around this groove, constricted again behind this groove and then slightly enlarged again at the posterior margin; in its anterior portion this band contains a median and a pair of lateral darker lines. There is a more or less distinct broad, interrupted yellow submarginal band on the posterior two-thirds of the cephalothorax; a yellow line beneath the anterior eyes; while the remainder of the cephalothorax is shining dark brown or blackish. *Sternum* shining, with few hairs, yellowish-brown with darker margins. *Abdomen* in the brightest individuals above with a narrow median green band on its anterior half, this band pointed at each end and bordered laterally by a broader stripe of silvery-white interrupted by black spots; on the posterior half of the dorsum the silvery-white is continued as a few broad transverse areas, spotted by black; lateral to this silvery-white is a broader black area, deep black and not inter-

rupted anteriorly (on the anterior aspect of the abdomen the black band of one side joins with that of the other), while posteriorly the black band widens and becomes mottled with buff; sides buff, spotted with black posteriorly; venter yellow in front of the lung-books, behind them pale brown with small spots of darker brown and black. In other individuals the dorsum shows the same general pattern, but the silvery-white is replaced by yellow and the black by brown. *Epigynum* reddish-brown. *Spinnerets* pale brown. *Chelicera* brown or almost black, the macula red. *Labium* as dark as the chelicera but with lighter distal end, and *maxillæ* lighter. *Legs* in the brightest individuals clear greenish-yellow, distinctly ringed with black on all the joints except the tarsi, each coxa black on its anterior and posterior aspects, the tarsi reddish-brown. *Palpi* colored like the legs.

Comparisons.—This species comes very close to *sublata*, but differs from it in the coloration of the cephalothorax and of the abdominal venter. The epigyna of the two are very similar.

Habits.—Not common, on damp ground under stones, on the margin of streams.

***Trochosa pratensis* (Emerton).**

Lycosa pratensis Emerton, 1885.

Lycosa pratensis Emerton, Montgomery, 1903.

(♀ ♀ from Wood's Hole, Massachusetts.)

Eyes.—First row a little broader than the second, the middle eyes larger and slightly lower, lateral eyes nearer the second row than to the clypeal margin. Eyes of second row largest, their diameter apart. Length of dorsal eye area to cephalothorax as 1 : 6.5.

Form.—Cephalothorax highest between the posterior eyes and the dorsal groove, in front truncated and a little more than one-half its greatest transverse diameter, sides of head oblique. Chelicera longer than the width of the clypeus, 2.5 times the height of the head in front. Labium longer than wide, its sides nearly parallel, truncated apically, one-half the length of the maxillæ. Sternum longer than broad. Spinnerets equal. Legs thick, leg IV to cephalothorax as 2.7 : 1; metatarsus IV shorter than the patella and tibia combined. Palpal claw with 5 teeth.

***Trochosa contestata* (Montg.).**

Lycosa contestata Montg., 1903.

(♀ from Wood's Hole, Massachusetts.)

Eyes.—First row slightly shorter than the second, much nearer the clypeal margin than to the second row, middle eyes double the size of the lateral and a little higher. Eyes of the second row nearly 1.5 times

their diameter apart. Eyes of the third row nearly as large as those of the second. Dorsal eye area to the cephalothorax as 1 : 6.

Form.—Cephalothorax highest a little anterior to the middle, in front truncated and about one-half its greatest transverse diameter, the sides of the head rather oblique. Chelicera about as long as the width of the clypeus, fully 2.5 times the height of the head in front, with 4 teeth on the inferior and 3 on the anterior margin. Labium longer than wide, truncated apically, one-half the length of the maxillæ. Maxilla indented on the inferior surface near the distal end. Sternum longer than broad. Spinnerets equal. Leg IV to cephalothorax as 3.6 : 1; metatarsus IV shorter than patella and tibia combined. Palpal claw with 4 teeth.

Trochosa avara Keyserling. Pl. XX, fig. 42.

Trochosa avara Keys., 1876.

Lycosa avara (Keys.), Montgomery, 1903.

(One ♀ from Philadelphia; numerous individuals of both sexes from Austin, Texas.)

Eyes.—First row slightly narrower than the second, straight, equidistant from the second row and the clypeal margin, the middle eyes closely approximated and fully 1.5 the size of the lateral. Eyes of second row largest, fully (♂) or almost (♀) their diameter apart. Dorsal eye area to cephalothorax as 1 : 6. Quadrilateral of the posterior eyes longer than broad.

Form.—Cephalothorax highest behind the middle, in front truncated and one-half (♀) or less (♂) as wide as its greatest transverse diameter, the sides of the head oblique. Chelicera longer than the width of the clypeus, their length fully three times the height of the head in front, with 3 pairs of teeth. Labium longer than broad, truncated apically, not one-half the length of the maxillæ. Sternum longer than broad. Anterior spinnerets longest. Leg IV to cephalothorax (♀) as 3 : 1; metatarsus IV shorter than patella and tibia combined. ♀ palp with 5 teeth.

Remarks.—The Texas specimens agree essentially with Keyserling's description except in the following points: The epigynum is distinctly broader than long. The abdomen above has a more or less distinct median darker band edged with yellowish on the anterior half, and a pair of white spots on the posterior half, the rest of the anterior surface being finely mottled with black and brown; on the posterior dorsum are narrow transverse stripes of brown, between each two of which is a pair of black spots (each surrounded by a brown ring); the venter is pale brown with minute black spots.

Habits.—A common species in the vicinity of Austin, under stones on dry hillsides.

Trochosa purcelli (Montg.).

Lycosa purcelli Montg., 1902.

Lycosa kochii Keys., Emerton, 1885.

nec *Tarentula kochii* Keys., 1876.

Lycosa nigraurata Montgomery, 1902.

(Several specimens from Pennsylvania, New Jersey and Massachusetts.)

Eyes (♀).—First row slightly shorter than the second, nearer the clypeal margin than to the second row, about straight or lateral eyes slightly lower, middle eyes 1.5 times the size of the lateral. Eyes of second row largest, slightly more than their diameter apart. Dorsal eye area to cephalothorax as 1 : 4.75. Quadrilateral of the posterior eyes broader than long.

Form (♀).—Cephalothorax highest at about the middle, in front truncated and not quite one-half its greatest transverse diameter, the sides of the head oblique. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, their length 2.25 times the height of the head in front. Labium longer than broad, slightly concave apically, not one-half the length of the maxillæ. Sternum rounded. Leg. IV to cephalothorax as 3.5 : 1. Metatarsus IV shorter than patella and tibia combined. Spinnerets about equal in length. Palpal claw with 4 teeth.

Remarks.—In addition to certain slight differences in the form of the epigyna (mentioned in my preceding paper), this form is to be separated from *kochii* in that the cephalothorax in front is less than one-half its greatest transverse diameter, instead of "vorn bedeutend mehr als halb so breit als in der Mitte," and in being highest at or behind the middle. The male which I had described as a new species (*nigraurata*) is an unusually bright-colored individual, with 4 teeth on the posterior margin of one of the chelicera.

Trochosa cinerea (Fabr.). Pl. XX, fig. 43.

Araneus cinereus Fabricius, 1793.

Lycosa lynx Hahn, 1831.

Lycosa halodroma C. Koch, 1848.

Arctosa cinerea Idem.

Arctosa lynx Idem.

Lycosa maritima Hentz, 1841.

Lycosa cinerea Fabr., Emerton, 1885.

Lycosa cinerea Fabr., Stone, 1890.

Lycosa cinerea Fabr., Montgomery, 1902.

(Numerous specimens from Austin, Texas; Wood's Hole, Massachusetts; Long Island, New York; New Jersey.)

Eyes.—First row straight, as broad as the second, nearer the clypeal margin than to the second row, middle eyes fully twice as large as the lateral. Eyes of second row largest, their diameter apart. Dorsal eye area to cephalothorax as 1 : 4.5. Quadrilateral of the posterior eyes slightly longer than broad.

Form.—Cephalothorax highest between the posterior eyes and the dorsal groove, in front more than one-half its greatest transverse diameter (♀) or less (♂) and truncated (♀) or rounded (♂). Sides of head moderately oblique and rounded. Chelicera with 3 pairs of teeth, much longer than the width of the clypeus, in length about 2.5 times the height of the head in front. Labium longer than broad, truncated apically, fully one-half the length of the maxillæ. Legs strong with short spines; leg IV to cephalothorax as 4 : 1; metatarsus IV shorter than patella and tibia combined. ♀ palpal claw with 3 minute teeth. ♂ palpal tibia twice as long as the patella, and narrower, the point of the tarsus fully as long as the bulbus. Anterior spinnerets longest.

Comparisons.—This differs from the European form, judging from Simon's description (*Arachnides de France*), in that the fourth tibia and patella combined are considerably longer than the cephalothorax (instead of the same length), and in that the fourth leg is 4 times the length of the cephalothorax instead of 3.3 times. The two species may prove to be distinct.

The Texas specimens differ from the northern ones in large size (♀ with a cephalothoracal length of 7.5 mm.), and in being much paler colored.

Habits.—In the North this is a species of the sea coast. At Austin it is common, particularly in the fall, under stones close to fresh water.

***Trochosa frondicola* (Emerton).**

Lycosa frondicola Emerton, 1885

Lycosa frondicola Emerton, Stone, 1890.

Lycosa frondicola Emerton, Montgomery, 1902, 1903.

(Specimens from Pennsylvania and Massachusetts.)

Eyes.—First row fully as broad as the second, middle eyes larger and slightly lower, nearer the clypeal margin than to the second row. Eyes of second row largest, 1.4 times their diameter apart. Dorsal eye area to cephalothorax as 1 : 5. Quadrilateral of the posterior eyes broader than long.

Form.—Cephalothorax slightly highest behind the middle, in front truncated and quite (♂) or more than (♀) one-half its greatest transverse diameter, with the sides of the head oblique. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, their length twice

the height of the head in front. Labium longer than broad, apically truncated, one-half the length of the maxillæ. Sternum large, longer than broad. Leg IV to cephalothorax, ♂ 3.8 : 1, ♀ 3 : 1. Metatarsus IV shorter than patella and tibia combined. ♀ palpal claw with 3 teeth.

***Trochosa sepulchralis* (Montg.).**

Lycosa sepulchralis Montgomery, 1902, 1903.

(Specimens from Pennsylvania, and from Austin, Texas.)

Eyes.—First row fully as broad as the second, middle eyes twice as large as the lateral, straight (♂) or middle eyes lower (♀), equidistant from the second row and the margin of the clypeus (♀) or upon the margin of the clypeus (♂). Eyes of second row three-fourths their diameter apart. Dorsal eye area to cephalothorax as 1 : 7. Quadri-lateral of the posterior eyes broader than long.

Form.—Cephalothorax highest between the posterior eyes and the dorsal groove, the sides of the head oblique, in front more than one-half as broad as its greatest transverse diameter (♀) or less (♂). Chelicera with 3 pairs of teeth, their length about 2.5 times the height of the head in front, as long (♂) or longer (♀) than the width of the clypeus. Labium longer than broad, apically truncated, in the ♀ one-half the length of the maxillæ but less in the ♂. Sternum large with few hairs. Anterior spinnerets longest. Leg IV to cephalothorax, ♂ 4 : 1, ♀ 3.3 : 1. Metatarsus IV shorter than the patella and tibia combined. ♀ palpal claw with 3 pairs of teeth.

***Trochosa rubicunda* Keys. Pl. XIX, fig. 30.**

Trochosa rubicunda Keyserling, 1876.

Lycosa polita Emerton, 1885.

(One ♀ from Massachusetts, from J. H. Emerton.)

Eyes.—First row broader than the second on each side by the diameter of a lateral eye, the middle eyes slightly lower than the lateral and larger. Eyes of the second row largest, one-half their diameter apart. Third row slightly wider than the first. Ocular area much wider than long, and not more than one-ninth the length of the cephalothorax.

Form.—Cephalothorax without hairs, rounded anteriorly where it is more than one-half its greatest diameter, highest at the middle and gradually sloping down to the eye region, oblique on the sides. Chelicera with 3 pairs of teeth, longer than the width of the clypeus, their length three times the height of the head in front. Labium longer than broad, slightly concave apically, less than one-half the length of the maxillæ. Sternum very large and with few hairs, truncated

straight anteriorly and pointed posteriorly. Anterior spinnerets longest. Legs short and thick, 1 ventral spine on tibia I, 2 on tibia II, 3 pairs on tibiae III and IV; metatarsus IV shorter than patella and tibia combined; leg IV to cephalothorax as 2.4 : 1.

Trochosa sublata (Montg.).

Lycosa sublata Montgomery, 1902.

(♀, type, Point Pleasant, New Jersey.)

Eyes.—First row slightly broader than the second, straight, nearer the second row than to the clypeal margin, middle eyes slightly larger. Eyes of second row largest, their diameter apart. Third row slightly broader than the first, its eyes more than twice their diameter behind the second row. Quadrilateral of the posterior eyes longer than broad. Dorsal eye area to length of cephalothorax as 1 : 5.

Form.—Cephalothorax in front somewhat rounded and more than one-half its greatest transverse diameter, highest at the middle; head low and its sides oblique. Chelicera with 3 pairs of teeth, their length greater than the width of the clypeus and quite 3 times the height of the head in front. Labium longer than wide, truncated apically, not one-half the length of the maxillæ. Legs thick, metatarsus IV shorter than patella and tibia combined. Length of leg IV to cephalothorax as 3.6 : 1.

Genus **PIRATA** Sundevall, 1833.

The main combinations of characters of this genus are: The first eye row is fully as broad as the second (slightly shorter in *elegans* and *nigromaculatus*); the length of the posterior spinnerets is quite 1.5 times that of the anterior, frequently twice; the metatarsus IV is in both sexes shorter than the patella and tibia combined by only one-third the length of the patella (one-half in *marxi*); the inferior tarsal claw is toothed (except in *marxi*); the sides of the head are oblique (except in *elegans* and the ♂ of *liber*); the chelicera are weak, rather straight anteriorly, their length not more, usually less, than twice the height of the head in front; the labium is large and longer than broad. The chelicera have 2 or 3 teeth on the posterior border. The eyes of the second row are less than 1.5 times their diameter apart. The cephalothorax is highest behind the middle, or in the cephalic region (*elegans*). Tibia I has 3 ventral pairs of spines. The length of leg IV to the cephalothorax varies from 3.3 : 1 to 4.6 : 1; the legs have generally long spines and frequently fine long hairs.

It is somewhat doubtful whether this genus is a homogeneous one; *marxi* approaches *Trochosa*, and *elegans*, *Lycosa*. There are also some

resemblances to *Aulonia*. All the species of *Pirata* known to me live beneath stones close to water, and spin for themselves during the cold season little closed nests.

KEY TO SPECIES OF *PIRATA*.

- a. 1.—Eyes of the second row not more than one-half their diameter apart, chelicera with 2 teeth on the posterior margin, . *marxi*.
- a. 2.—Eyes of the second row nearly or quite their diameter apart, chelicera with 3 teeth on the posterior margin.
 - b. 1.—Sternum blackish with a yellow median band and 3 yellow spots on each side, cephalothorax of the ♀ only one-quarter longer than broad, *prodigiosus* Keyserling, 1876.
 - b. 2.—Sternum not so colored, cephalothorax in the ♀ one-half longer than broad.
 - c. 1.—Venter with dark bands or rows of dark spots, femora usually distinctly annulated, *liber*.
 - c. 2.—Not so colored.
 - d. 1.—Legs almost devoid of hairs, . . . *elegans*,
 - d. 2.—Legs covered with fine soft hairs.
 - e. 1.—A large dark spot at each side of the spinnerets, ♀ with leg IV 3.3 times the length of the cephalothorax, . *nigromaculatus*.
 - e. 2.—No such black spots, ♀ with leg IV 4.4 times the length of the cephalothorax, *sedentarius*.

Pirata marxi Stone. Pl. XIX, fig. 27.

Pirata marxi Stone, 1890.

Pirata marxi Stone, Montgomery, 1902.

Pirata piraticus Clerck, Emerton, 1885.

nec *Pirata piraticus* Clerck.

(♀, type, Pennsylvania; ♀ from Massachusetts.)

Eyes.—First row fully as broad as the second, straight, nearer the second row than the margin of the clypeus, the middle eyes only slightly larger than the lateral. Eyes of the second row one-half their diameter apart. Length of dorsal eye area to cephalothorax as 1 : 5.5. Quadrilateral of the posterior eyes much wider than long.

Form.—Cephalothorax without hairs, highest behind the posterior eyes, posterior declivity very abrupt and steep, in front one-half its greatest transverse diameter. Chelicera with 3 teeth anteriorly and 2 posteriorly, rather straight anteriorly, their length greater than the width of the clypeus and about twice the height of the head in front. Labium longer than broad and more than one-half the length of the maxillæ, broadest behind its middle, rounded apically. Sternum large, nearly round. Length of leg IV to cephalothorax as 3.8 : 1; metatarsus IV shorter than patella and tibia combined by one-half the

length of the patella. No teeth on the inferior tarsal claws. Palpal claw with 5 teeth.

Comparisons.—This is the species identified by Emerton with the European *piraticus*. But they are distinct, judging from the description given by Simon in his *Arachnides de France*. The structure of the epigyna differs; in *marxi* the median anterior eyes are but little larger than the lateral (instead of almost double their size) and almost contiguous (instead of being separated by a little more than their diameter), and further, these median eyes are much nearer each other than to the lateral; in *marxi* also tibia and patella IV combined are longer than the cephalothorax (instead of shorter); and there are differences in coloration.

***Pirata elegans* Stone.**

Pirata elegans Stone, 1890.

Pirata elegans Stone, Montgomery, 1902.

(Four ♀ ♀, types, York county, Pennsylvania.)

Eyes.—First row somewhat shorter than the second, middle eyes slightly higher and a little smaller than the lateral, and nearer each other than to the lateral, equidistant from the clypeal margin and the second row. Eyes of the second row largest, slightly more than their diameter apart. Third row broadest, its eyes about twice their diameter behind the second row. Quadrilateral of the posterior eyes as long as broad. Length of dorsal eye area to cephalothorax as 1 : 4.3.

Form.—Cephalothorax in front truncated and not quite one-half its greatest transverse diameter, highest at the posterior eyes, sides of head rather steep, head projecting in front of the clypeus. Chelicera with 3 pairs of teeth, their length greater than the width of the clypeus and not quite twice the height of the head in front, nearly straight anteriorly. Labium longer than broad, not one-half the length of the maxillæ, widest just behind its middle, rounded apically. Sternum longer than broad. Posterior spinnerets longest (almost twice the length of the anterior). Length of leg IV to cephalothorax as 3.7 : 1; metatarsus IV not quite as long as patella and tibia combined. One tooth on the inferior tarsal claw.

Comparisons.—This species is intermediate between *Lycosa* and *Pirata*, resembling the former in the height of the head and the shortness of the first eye row.

***Pirata nigromaculatus* Montg.**

Pirata nigromaculatus Montgomery, 1902.

(Types, Luzerne county, Pennsylvania.)

Eyes.—First row almost as broad as the second, equidistant from the

clypeal margin and the second row, eyes equal, straight or the middle eyes slightly higher. Eyes of the second row largest, 1.3 times their diameter apart. Third row broadest, its eyes nearly twice their diameter behind the second row. Quadrilateral of the posterior eyes broader than long. Length of the dorsal eye area to the cephalothorax as 1 : 4.8.

Form.—Cephalothorax in front rounded (♀) or truncated straight (♂), almost (♀) or decidedly less (♂) than one-half its greatest transverse diameter, about equally high at the posterior eyes and the middle, the eyes projecting in front of the clypeus. Chelicera with 3 pairs of teeth, nearly straight anteriorly, their length greater than the width of the clypeus and about 1.8 times the height of the head in front. Labium longer than broad, about one-half the length of the maxillæ, truncated (♀) or rounded (♂) apically. Posterior spinnerets nearly double the length of the anterior. Metatarsus IV shorter than the patella and tibia combined; length of leg IV to cephalothorax (♀) as 3.3 : 1. Inferior tarsal claw with 1 tooth.

Pirata liber Montg.

Pirata liber Montgomery, 1902, 1903.

(Numerous specimens from Pennsylvania, New Jersey and Massachusetts.)

Eyes.—First row almost or quite as broad as the second, straight, equidistant from the second row and the clypeal margin, eyes adequal. Eyes of the second row 1.3 times their diameter apart. Length of the dorsal eye area to the cephalothorax as 1 : 5.5. Quadrilateral of the posterior eyes much broader than long.

Form.—Cephalothorax very slightly higher behind the middle than at the posterior eyes (♀) or decidedly highest at the median groove (♂); the median groove lies on the dorsal surface and not on the posterior declivity, this declivity being very abrupt in the ♂; the cephalothorax in front is almost (♀) or decidedly less (♂) than one-half its greatest transverse diameter; the sides of the head nearly vertical (♂) or more oblique (♀). Chelicera with 3 pairs of teeth, weak and straight in front, their length about 1.75 times the height of the head in front and (in the ♀) shorter than the width of the clypeus. Labium large, truncated apically, longer than broad, fully one-half the length of the maxillæ. Sternum longer than broad. Posterior spinnerets more than twice the length of the anterior. Metatarsus IV a little shorter than the patella and tibia combined. Length of leg IV to cephalothorax (♀) as 3.3 : 1. Palpi and legs with long soft hairs, most noticeable on the

tibiæ and metatarsi (especially in the ♂). Inferior tarsal claw with 2 or 3 teeth. ♀ palpal claw with 3 or 4 teeth.

Pirata sedentarius n. sp. Pl. XIX, figs. 28, 29.

(Numerous specimens from Austin, Texas.)

Eyes.—First row as broad or slightly broader than the second, straight or the middle eyes a little higher, equidistant from the second row and the clypeal margin, the middle eyes largest and slightly nearer to the lateral eyes than to each other. Eyes of the second row slightly more than their diameter apart. Third row considerably broader than the second. Quadrilateral of the posterior eyes broader than long. Length of the dorsal eye area to the cephalothorax as 1 : 6.

Form.—Cephalothorax in front truncated and not one-half its greatest transverse diameter, highest at the median groove, the posterior declivity making an angle of 45° with the dorsal contour. Sides of the head low and rounded, with long scattered hairs in the cephalic region. Chelicera with 3 pairs of teeth, nearly straight in front in the ♂, but more arched and robust in the ♀, their length about twice the height of the head in front. Labium longer than wide, apically truncated, more than one-half the length of the maxillæ. Maxillæ slender, only slightly enlarged distally, with nearly parallel sides, convex on the inner and concave on the outer border. Sternum much longer than wide, pointed posteriorly. Posterior spinnerets twice the length of the anterior. Legs with long spines and (particularly on the tibia and metatarsus of I and II) with long soft hairs. Palpi long and slender. Metatarsus IV a little shorter than patella and tibia combined; length of leg IV to cephalothorax as (♂) 4.6 : 1, (♀) 4.4 : 1. Inferior tarsal claw with 1 or 2 teeth. ♀ palpal claw with 4 teeth.

	<i>Dimensions.</i>		♂	♀
Cephalothorax,			2.3	2.5
Abdomen,			2.4	2.6
Leg I,			9.3	8
Leg II,			8	7.5
Leg III,			6	6.8
Leg IV,			10.5	11

Color (in alcohol).—The *cephalothorax* is marked with pale yellow and pale brown; the yellow forms a median band (half as wide as the eye area) extending from this area to the median groove, and continuing from there as a slightly broader band to the posterior margin; a little distance behind each posterior eye is another yellow band

which joins the median one at the median groove; there is a broader yellow submarginal band which does not extend to the head; the remainder of the cephalothorax is pale brown. *Sternum* yellow like the coxæ, with a narrow brown margin. *Abdomen* above with a rather narrow median yellow band largest at the anterior end and narrowing to a point at the middle; from this point to the posterior end, with more or less distinctness, is a series of 4-5 broad transverse yellow markings, and a larger elongate yellow mark on each side of the median band; all these yellow markings are demarcated by a ground color of pale brown or dark greenish. The sides are mottled or streaked with yellow or brown; the venter uniform pale yellow or pale brown. *Epigynum* black. *Chelicera* and *maxillæ* shining brownish, *labium* darker. *Legs* yellow, femora annulated with greenish or brownish, a white ring at the middle of the tibiæ; in the ♂ the tibiæ, tarsi and metatarsi of I and II and the metatarsi of IV are darker than the other joints. *Palpi* yellowish, in the ♂ the tarsal joint is brown.

Comparisons.—This species differs from the related *liber* mainly in form; greater relative length of legs; their greater hairiness; sides of the head very oblique in the ♂ instead of vertical; the posterior declivity of the cephalothorax in the ♂ much less steep.

Habits.—Very abundant at Austin, under moist stones close to water.

KEY TO THE NORTH AMERICAN GENERA OF PISAURIDÆ.

(This key has been compiled from Simon, 1898, since I have not seen representatives of the genera MAYPACIUS and THANATIDIUS.)

a. 1.—Area of the middle eyes longer than broad; tarsi usually provided with an onychium.

b. 1.—First eye row strongly procurved, the lateral usually larger than the middle eyes; clypeus narrow.

c. 1.—Lateral anterior eyes with the middle anterior occupying an area not broader than long,

MAYPACIUS Simon, 1898.

c. 2.—Lateral anterior eyes with the middle anterior occupying an area much broader than long,

THANATIDIUS Simon, 1898.

b. 2.—First eye row straight, eyes subequal; clypeus broad,

Pisaurina.

a. 2.—Area of the middle eyes broader, or not less broad, than long; tarsi without an onychium, DOLOMEDES.

Genus **DOLOMEDES** Latreille, 1804.

KEY TO THE SPECIES OF DOLOMEDES.

(For the females only.)

- a. 1.—Second eye row broader than the first, posterior edge of the eyes of the second row on a line with the anterior edge of the eyes of the third row, . . . *scapularis* Koch, Keyserling, 1876.
- a. 2.—Eyes not so.
 - b. 1.—Head not demarcated from the cephalothorax; cephalothorax with a very distinct, white submarginal band; sternum with 3 pairs of black spots, . . . *sexpunctatus*.
 - b. 2.—Head demarcated from the cephalothorax; not so colored.
 - c. 1.—Median piece of epigynum only one-half its length; leg IV longer than I by less than one-third the length of its terminal joint, *idoneus*.
 - c. 2.—Median piece of the epigynum extending its whole length; leg IV longer than I by almost the full length of its terminal joint.
 - d. 1.—Epigynum distinctly broader than long; legs uniform dark color without rings below, with indistinct yellowish markings on the superior surface of the femora, coxæ the same color as the sternum; sternum with median band indistinct; cephalothorax without a yellow median line; abdominal dorsum with a yellow median band, anteriorly to the anterior end of which joins a pair of less distinct yellow lines, and posteriorly with 3 pairs of small white spots connected by transverse whitish lines that are slightly curved, *urinator*.
 - d. 2.—Epigynum almost as long as broad; legs above with distinct yellow marbling on the femora, below with distinct rings on the patellæ, tibiæ and metatarsi, the coxæ below clear yellow and lighter than the sternum; sternum blackish with a distinct yellow median band; cephalothorax with a distinct yellow median line; abdominal dorsum anteriorly with 3 pairs of lateral yellow lines connected with the median one, posteriorly without pairs of white spots and with a series of transverse yellow bands each of the shape of a W, *fontanus*.

Dolomedes sexpunctatus Hentz. Pl. XX, fig. 34.*Dolomedes sexpunctatus* Hentz, 1841.*Dolomedes sexpunctatus* Hentz, Emerton, 1885.*Dolomedes sexpunctatus* Hentz, Montgomery, 1903.

(Numerous specimens from Austin, Texas, and one from Massachu-

Eyes.—First row broader than the second, much nearer to the second row than the clypeal margin, middle eyes lower and slightly larger. Eyes of the second row quite their diameter apart (\varnothing) or less (σ). Third row broadest, its eyes on tubercles and nearly as large as those of the second row. Dorsal eye area about one-seventh the length of the cephalothorax. Quadrilateral of the middle eyes as long as broad (\varnothing) or slightly broader than long (σ).

Form (σ).—The σ differs from the \varnothing in the cephalothoracal outline being much more rounded, the head in front only one-third its greatest transverse diameter, the clypeus vertical so that the eyes project forward beyond it. The legs are very slender, the fourth longest and 5.8 times the length of the cephalothorax, the first slightly longer than the second, the third extending only to the end of the metatarsus of the second. The palpal tibia has a large process on its external surface as long as length of the tibia, and with a small tooth on the ventral distal apex.

	<i>Dimensions.</i>	σ	\varnothing from Texas.
Cephalothorax,		4.5	9.5
Abdomen,		4	11
Leg I,		25	35
Leg II,		24	34.5
Leg III,		21	32
Leg IV,		26	40

Color of Male (specimen from Austin, in alcohol).—*Cephalothorax* pale yellowish-brown, sides below the submarginal white stripe darker, otherwise as in the \varnothing . *Sternum* pale yellowish-white with 3 pairs of distinct dark spots. *Abdomen* with the dorsal pattern very distinct. There is a dorso-median band along its entire length, yellow in color and bordered on each side by a somewhat narrower blackish band containing a row of 5 white spots, the two anterior of which are largest and furthest apart, while the three posterior are connected with the corresponding ones of the opposite side by transverse white lines; lateral to each of these blackish bands is a broader greenish-brown stripe. The sides are whitish, finely streaked with brownish. The venter is pale yellow. *Legs* very pale yellow, metatarsi and tarsi a little darker. *Palpi* pale yellow, the spine of the tibia and the lower surface of the palpal organ black.

Form (\varnothing).—Cephalothorax in front truncated straight, somewhat less than one-half its greatest transverse diameter, its greatest diameter barely equalling the distance from the third eye row to the posterior margin, the cephalic portion not demarcated from the thoracic, highest

behind the middle, posterior declivity very steep, clypeus obliquely inclined. Chelicera with 4 teeth on the inferior margin. Sternum longer than broad, rounded. Labium slightly longer than broad, truncated straight apically, widest a little behind its middle. Relative length of legs IV, II, I, III, III only slightly shorter than I and II, all rather stout and scopulated; length of leg IV to cephalothorax as 4.3 : 1.

Remarks.—The Texas specimens are larger than the northern ones, and the femora are more or less banded above with brownish.

Habits.—Very abundant at Austin, under the stones close to streams. Females with cocoons are most abundant in the fall. An adult male was found in November, and numerous nearly full-grown males in January.

Dolomedes fontanus Emerton. Pl. XX, figs. 35–37.

Dolomedes fontanus Emerton, 1885.

?*Dolomedes scriptus* Hentz, 1841.

(Specimens from Pennsylvania and North Carolina.)

Eyes.—As in *urinator*.

Form.—The general form of the ♀, proportions of the legs, mouth parts, etc., are as in *urinator*. The ♂ differs in having the truncated anterior end of the cephalothorax but little broader than one-fourth its greatest transverse diameter, in the cephalothorax being distinctly highest behind the middle, and in the greater slenderness of the legs, which in order of length are IV, I, II, III. The palpus is longer than the cephalothorax, its terminal joint large, the tibia with an elevated lamina on the outer side, this lamina longer than wide and with its free border forming two larger and one smaller tooth, the ventral apical edge of the tibia with two teeth; the proximal dorsal portion of the tarsus has an elongated prominence and a small elevated knob lateral to this.

	<i>Dimensions.</i>		♂	♀
Cephalothorax,			7	7
Abdomen,			7	10
Leg I,			36	30.5
Leg II			33	31
Leg III,			32	28
Leg IV,			37	34

The largest ♀ has a cephalothoracal length of 9 mm.

Color of Females (in alcohol).—*Cephalothorax* brown with a narrow median line (splitting into two around the dorsal groove) from the clypeus to the posterior margin, from the median side of each posterior eye arises a yellow line which passes backward and is so curved that

with its fellow of the opposite side it forms nearly a circle, its indistinct posterior end joining the median band anterior to the middle and at the point where a pair of small elongate black spots are apposed to the median line. On each side of the thoracal portion are three submarginal, rather broad and always distinct yellow marks which are placed obliquely. The extreme margin is black, and there are reticular black lines radiating from the dorsal groove. *Sternum* blackish with a yellow median band. *Abdomen* above greenish-brown, patterned distinctly with yellow as follows: There is a narrow median orange band, pointed at each end, which extends caudad not quite to the middle, from which arises on each side three oblique yellow lines, one from its posterior end, one (the longest) from its middle, and from its anterior end one which passes like the others latero-caudad and then bends at an angle to join the median band where the middle line joins it. On the posterior half of the dorsum are 4 transverse yellow bands, each of the shape of a W, the first of which is broadest and the first and second most distinct. The sides are greenish-brown, the venter paler greenish or yellowish. *Chelicera* black, *labium* and *maxillæ* reddish-brown with yellow ends. *Legs* above more or less distinctly ringed with yellow and reddish-brown, with a number of alternating rings on the femora, patellæ brownish, tibiæ yellow at the middle and brown at the ends, metatarsi dark at the middle and yellow at the ends, tarsi yellow proximally and brown distally; below the annulations are not as distinct as above, the femora finely mottled with greenish-brown and yellow, the coxæ yellow and lighter than the sternum. *Palpi* like the legs.

Color of Male (specimen from North Carolina, in alcohol).—*Cephalothorax* with the same pattern as in the ♀, but with yellowish-brown in place of dark brown. *Abdomen* like the ♀, but the yellow lines edged with black. *Mouth parts* yellow. *Legs* pale yellow without annulations, the distal ends of the tibiæ, metatarsi and tarsi black. The *palpus* yellow, tibial apophysis and dorsal proximal portion of tarsus black.

Comparisons.—This may possibly be the same as *D. scriptus* of Hentz, but that species is hardly recognizable from Hentz's brief description and poor figure. It is nearly related to *D. urinator* Hentz (cf.).

***Dolomedes urinator* Hentz.**

Dolomedes urinator Hentz, 1841.

Dolomedes tenebrosus Hentz, Emerton, 1885.

Dolomedes tenebrosus Hentz, Stone, 1890.

Dolomedes urinator Hentz, Montgomery, 1902.

(Numerous ♀ ♀ from Massachusetts, Pennsylvania, New Jersey, and Austin, Texas; 1 ♂ from Massachusetts.)

Eyes (♀).—First row broader than the second, its lateral eyes about their diameter from the second row, nearly straight, the middle eyes being only slightly lower than the lateral. Eyes of the second row almost their diameter apart. Third row broadest, its eyes almost as large as those of the second row and placed upon tubercles. Quadri-lateral of the middle eyes about as broad as long.

Form (♀).—Cephalothorax in front truncated straight and not quite one-half its greatest transverse diameter, highest behind the middle, the cephalic portion demarcated from the thoracic, its greatest transverse diameter equalling the distance from the posterior eyes to its posterior end, clypeus high and slightly inclined. Chelicera with 4 ventral and 3 dorsal teeth. Labium slightly longer than broad, slightly rounded apically, not one-half the length of the maxillæ. Sternum rounded. Legs slender, IV, II, I, III, IV longer than I by not quite the length of its terminal joint. Length of leg IV to cephalothorax as 4.1 : 1. Femur IV with a tuft of thickened hairs posteriorly near its distal end.

Color in Alcohol (♀).—The abdominal dorsum in all the specimens shows anteriorly a more or less distinct median yellow line ending in a point in front of the middle, and (generally less distinctly) a short oblique yellow line at each side of its anterior end; on the posterior half are 3 pairs of small white spots, connected transversely by as many black lines which are not of the shape of a W, but slightly curved with the concavity directed caudad; each of these white spots is surrounded by black, and only the 3 pairs on the posterior half of the dorsum are always distinct, but anterior to them are 1–3 pairs which are usually very indistinct (represented usually by small obscure black spots without white centers).

Characters of the ♂.—An adult dried specimen of one of the original males, described by Emerton as the male of *tenebrosus*, was kindly loaned to me by Mr. Emerton. The eyes are as in the ♀, the first row almost straight. The legs are in order I, II, IV, III. Femur IV has on its posterior border near the distal end a prominent bunch of long thickened hairs or short spines, which are much more prominent than in the female. The palpal tibia has on its outer surface a long curved tooth, and is on its ventro-distal border prolonged into a long toothed process; the palpus is longer than the cephalothorax. This being a dried specimen it is difficult to compare it with the alcoholic specimens of the females; but the color of the legs is the same, and also the general abdominal pattern (the 3 pairs of white spots are very distinct, and also the slightly curved transversed blackish lines connecting them); the

cephalothorax has a broad submarginal white band on each side, continued also across the forehead.

Comparisons.—There is no doubt that this is the *urinator* of Hentz; it possesses the pairs of small white spots on each posterior abdominal dorsum, and the slightly curved black lines (not of the shape of a W) connecting them, all shown distinctly in Hentz's figure. It is closely related to *fontanus*, and the epigyna of the two are very similar, but in *urinator* it is always much broader than long, and its median piece has a transverse groove just behind the middle, while in *fontanus* it is nearly as long as broad and is without such a groove. There are a number of constant differences, expressed in the key, which will serve to separate the species. The females of *idoneus* may be easily distinguished from those of both *urinator* and *fontanus* by the entirely different structure of the epigynum, and by leg IV being longer than I by less than one-third the length of the terminal joint.

Dolomedes idoneus Montgomery.

Dolomedes idoneus Montgomery, 1902.

?*Dolomedes tenebrosus* Hentz, 1841.

(♀ ♀ from Pennsylvania, New Jersey and Massachusetts.)

Eyes.—First row broader than the second, its middle eyes slightly larger and decidedly lower than the lateral (the dorsal margin of the middle eyes extends dorsad to a little beyond the level of the ventral margin of the lateral eyes), lateral eyes quite twice their diameter in front of the eyes of the second row. Eyes of the second row not quite their diameter apart. Third row broadest, its eyes on tubercles. Quadrilateral of the middle eyes as broad as long.

Form (♀).—Cephalothorax in front truncated straight, not quite one-half its greatest transverse diameter, the cephalic portion demarcated from the thoracic, highest at the posterior eyes. Chelicera with 4 ventral and 3 dorsal teeth. Labium as in *urinator*. Sternum slightly longer than broad. Legs rather slender, IV, II, I, III, IV and II nearly equal in length. Length of leg IV to cephalothorax as 4.1 : 1.

Comparisons.—Of all of Hentz's species this most nearly approaches his *tenebrosus*. But as I wrote before (1902), Hentz's description is entirely insufficient as a diagnosis; further, he placed *tenebrosus* under the "tenebrosæ" with the "eyes subequal, lower row as much curved as the upper," which is not the case in *idoneus*; and his figure of the mouth parts shows them entirely different from the condition in *idoneus*. It is high time that *tenebrosus*, which has occasioned so much dispute, should be allowed to fall into the synonymy on account of being insufficiently characterized.

" Genus **PISAURINA** Simon, 1898.

Pisaurina mira (Walck.).

Dolomedes mira Walckenaer, 1837.

Dolomedes virgatus Idem.

Micrommata undata Hentz, 1841.

Micrommata serrata Idem.

nec *Micrommata carolinensis* Hentz, 1841.

Ocyale undata Hentz, Emerton, 1885.

Ocyale undata Hentz, Stone, 1890.

Pisaurina mira Walck., Simon, 1898.

Ocyale undata (Hentz), Montgomery, 1902.

(Numerous specimens from Pennsylvania, New Jersey, Massachusetts and Texas.)

Eyes (♀).—First row separated from the clypeal margin by about the diameter of its eyes, broader than the second row, almost straight eyes equidistant, the middle slightly larger. Second row slightly broader than the area of the middle eyes of the first, its eyes not quite their diameter apart, slightly more than their diameter behind the first row and in diameter about 1.3 times the middle eyes of that row. Third row broadest, its eyes on tubercles and as large as those of the second row. Quadrilateral of the middle eyes longer than wide.

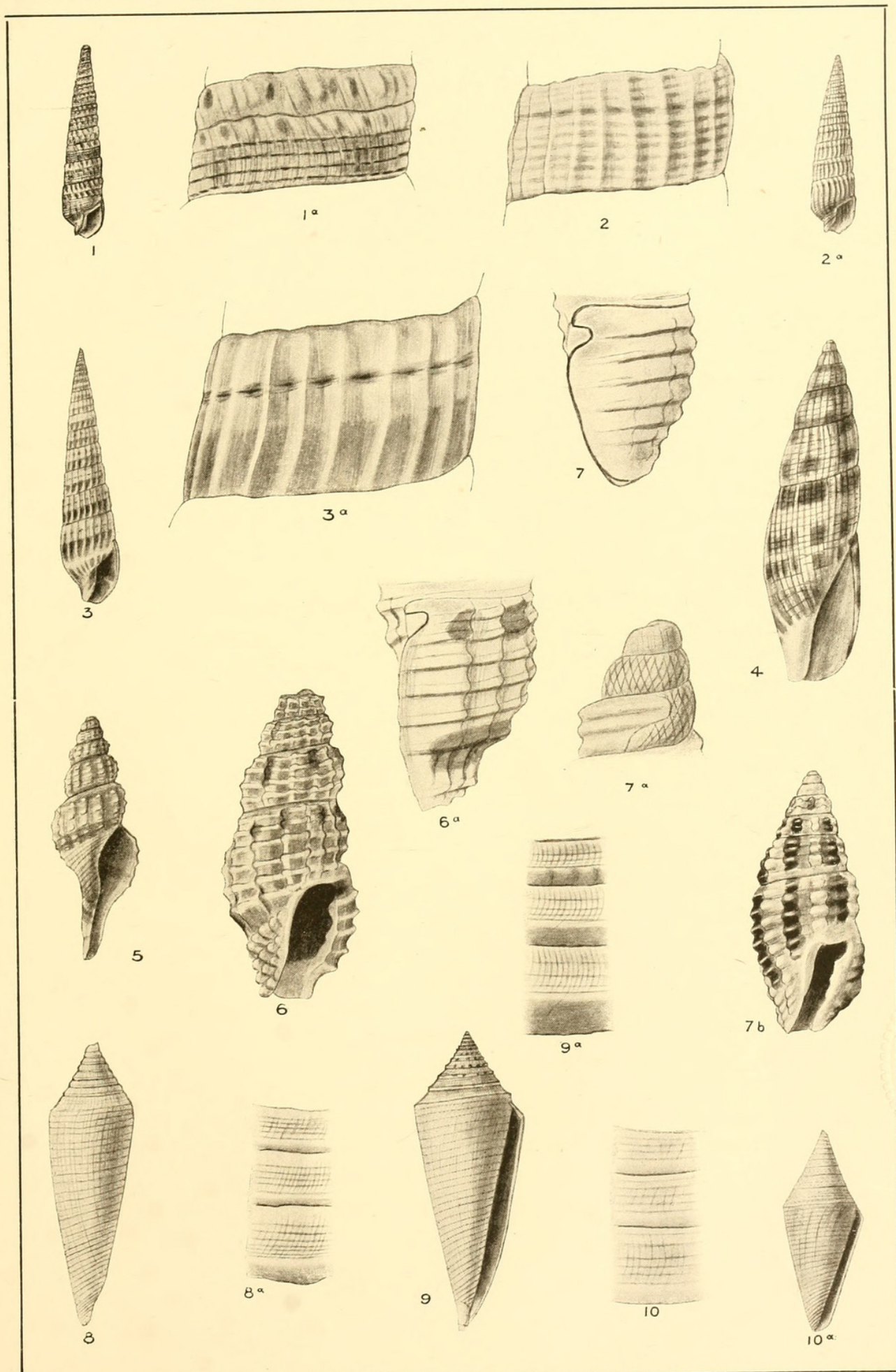
Form (♀).—Cephalothorax in front truncated straight and quite one-half its greatest transverse diameter, the cephalic portion quite well demarcated from the thoracic, about equally high at the posterior eyes and the dorsal groove, the clypeus nearly vertical. Sternum almost as broad as long, pointed behind. Labium widest at the middle, fully as wide as long, not one-half the length of the maxillæ, slightly convex apically. Posterior spinnerets longest. Legs slender, scopulæ not apparent, II, I, IV, III, legs I, II, and IV nearly equal in length. Length of leg IV to cephalothorax as 4.4 : 1.

Chelicera with 3 pairs of teeth.

Form (♂).—The eyes are as in the ♀, also the form and the relative length of the legs. The palpal tibia has on its outer border one small pointed tooth, little longer than wide.

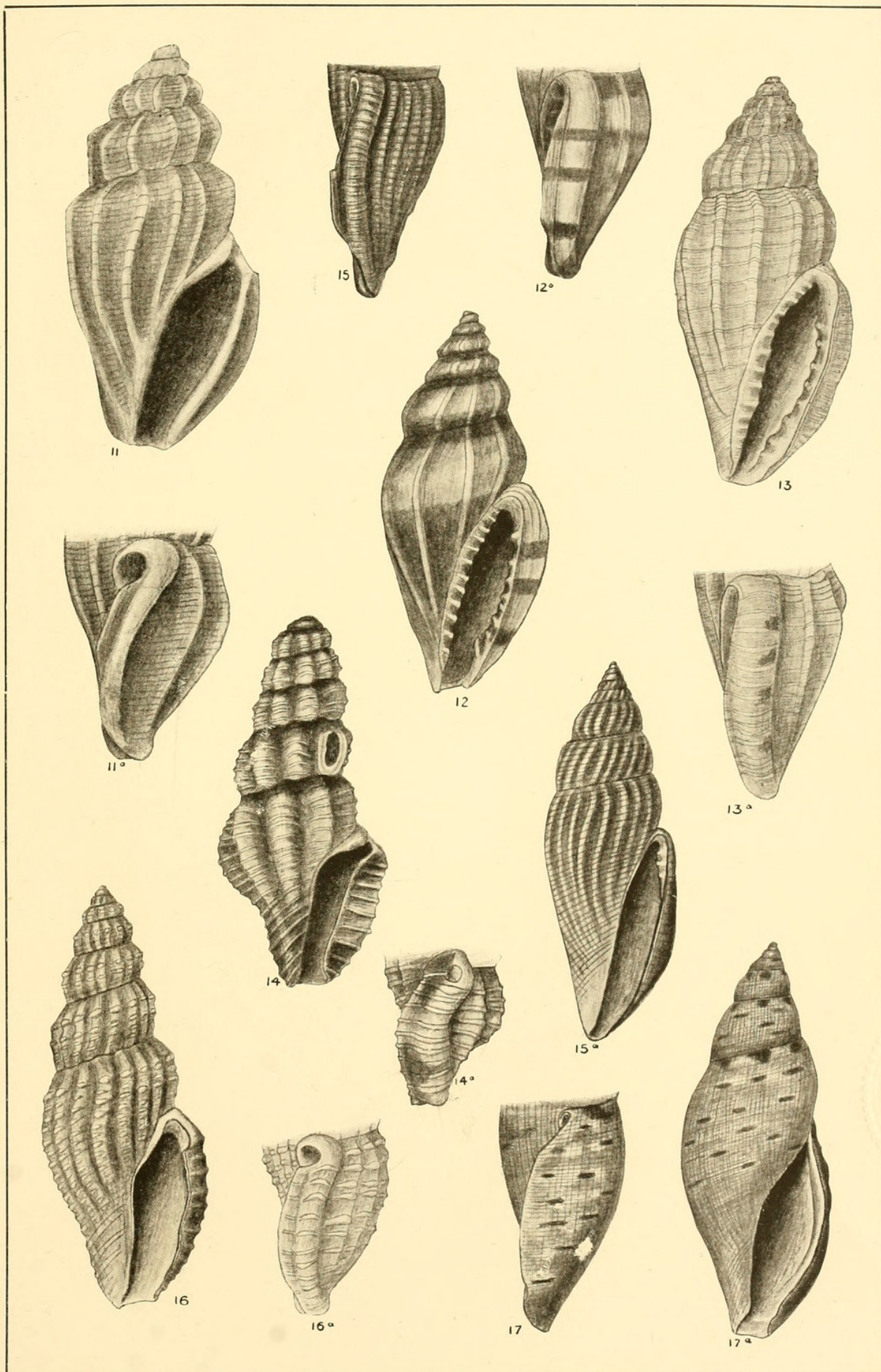
Color of Male (in alcohol).—The only adult specimen seen (one from Massachusetts, loaned by Mr. Emerton) had the cephalothoracal pattern as in the ♀, but with the median band little darker than the sides. The abdomen above with the narrow green median line on the anterior half as in the ♀, but the broad brown band not at all defined, so that the dorsum is pale orange with on each side a row of several pale yellow, short oblique lines, corresponding in position to the margin of the broad brown band in the ♀. The rest of the coloration as in the ♀.

Nearly mature males from Texas have the dorsal dark bands as distinct as in the female.



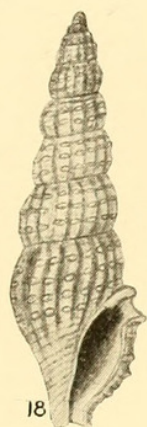
Winchester del.

PILSBRY. NEW JAPANESE MARINE MOLLUSCA.

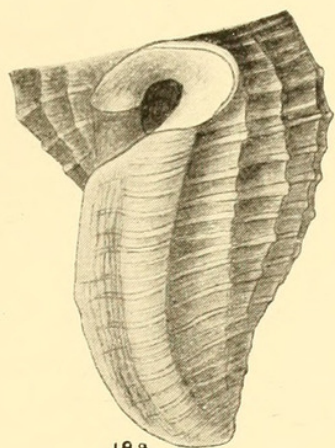


Vanatta del.

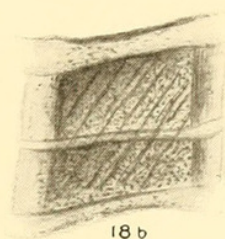
PILSBRY. NEW JAPANESE MARINE MOLLUSCA.



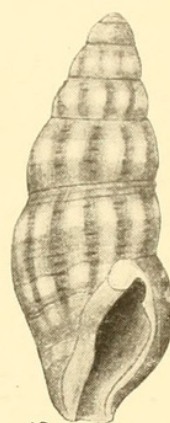
18



18^a



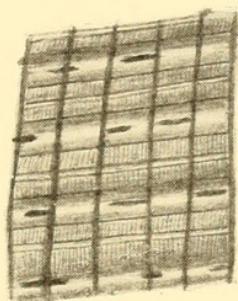
18^b



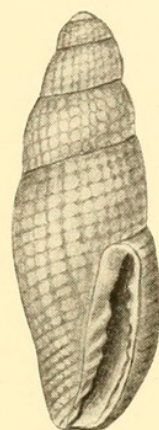
19



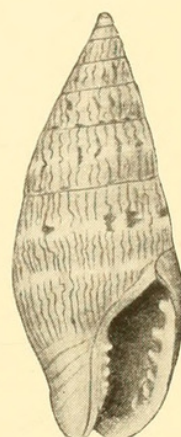
21



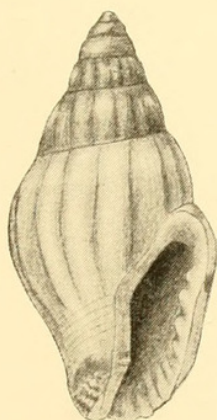
21^a



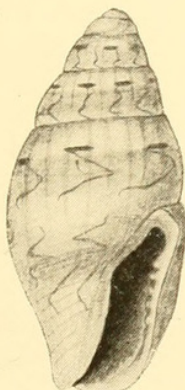
22



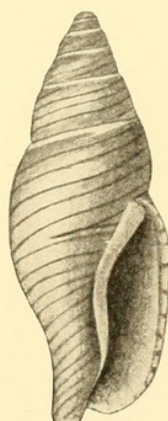
23



24



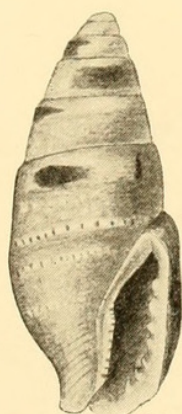
25



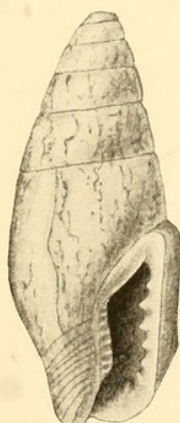
26



27



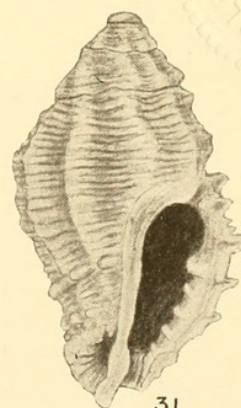
28



29



30



31



Montgomery, T H. 1904. "Descriptions of North American Araneae of the families Lycosidae and Pisauridae." *Proceedings of the Academy of Natural Sciences of Philadelphia* 56, 261–325.

View This Item Online: <https://www.biodiversitylibrary.org/item/30096>

Permalink: <https://www.biodiversitylibrary.org/partpdf/9469>

Holding Institution

MBLWHOI Library

Sponsored by

MBLWHOI Library

Copyright & Reuse

Copyright Status: NOT_IN_COPYRIGHT

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.