

FLORIDA SPIDERS IN THE *RUFUS* GROUP IN THE GENUS *PHILODROMUS* (ARANEAE: THOMISIDAE)

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The most useful means of classifying the North American species of *Philodromus* is to divide them into three groups according to carapace proportions, number of eye tubercles, and features of the external genitalia. The *aureolus* group (Dondale, 1961) and the *rufus* group (defined below) account for the majority of the species, while the remainder (e.g., *P. alascensis* Keyserling and *P. virescens* Thorell) comprise a small third (or possibly a third and fourth) group characterized in part by modifications in the tibial apophyses of the male palpus. In particular, the ventral apophysis is either in the form of a short, rounded lobe or entirely absent.

The *rufus* group can be defined briefly as follows: males rarely exceeding 3.5 mm in body length, and females rarely 4.5 mm; carapace usually longer than wide, and all the eyes except the anterior medians seated on small tubercles; ventral tibial apophysis of the male palpal tibia elongate, soft, and flattened; spermathecae of females situated anterior to rather than at, the genital groove.

The group presents a special challenge to the taxonomist because of the presence of several complexes of closely-similar forms. Some of these problems are discussed in this paper, particularly those involving the Florida peninsula and adjacent parts of the continent.

There are seven members of the *rufus* group in Florida. *P. placidus* Banks, *P. marxi* Keyserling, and *P. imbecillus* Keyserling range widely over North America and extend various distances into the Florida peninsula, although rarely south of approximately 28° north latitude. *P. montanus* Bryant and *P. floridensis* Banks are restricted to the southeastern United States. *P. peninsulanus* Gertsch and *P. bilineatus* Bryant are known only from the southern tip of Florida.

Philodromus placidus Banks

Synonymy. See Kaston (1948), Roewer (1954), and Bonnet (1958).

Description. See Kaston (1948).

Range. Alaska to Nova Scotia, south to Vancouver Island, Utah, Vera Cruz, and Florida.

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Florida Localities. Liberty County; Tallahassee; Leesburg; Trilby.

Comments. *P. placidus* appears to be a characteristic spider of coniferous trees. Both adults and immatures are recognized by the presence of a prolateral, dark, longitudinal band on patellae III and IV. Adult males have a coat of shiny scales on the abdominal dorsum, as do also the males of *peninsulanus*, *marxi*, and *imbecillus*.

Philodromus peninsulanus Gertsch

Figures 4, 9, 12, 18

Synonymy. See Roewer (1954) and Bonnet (1958).

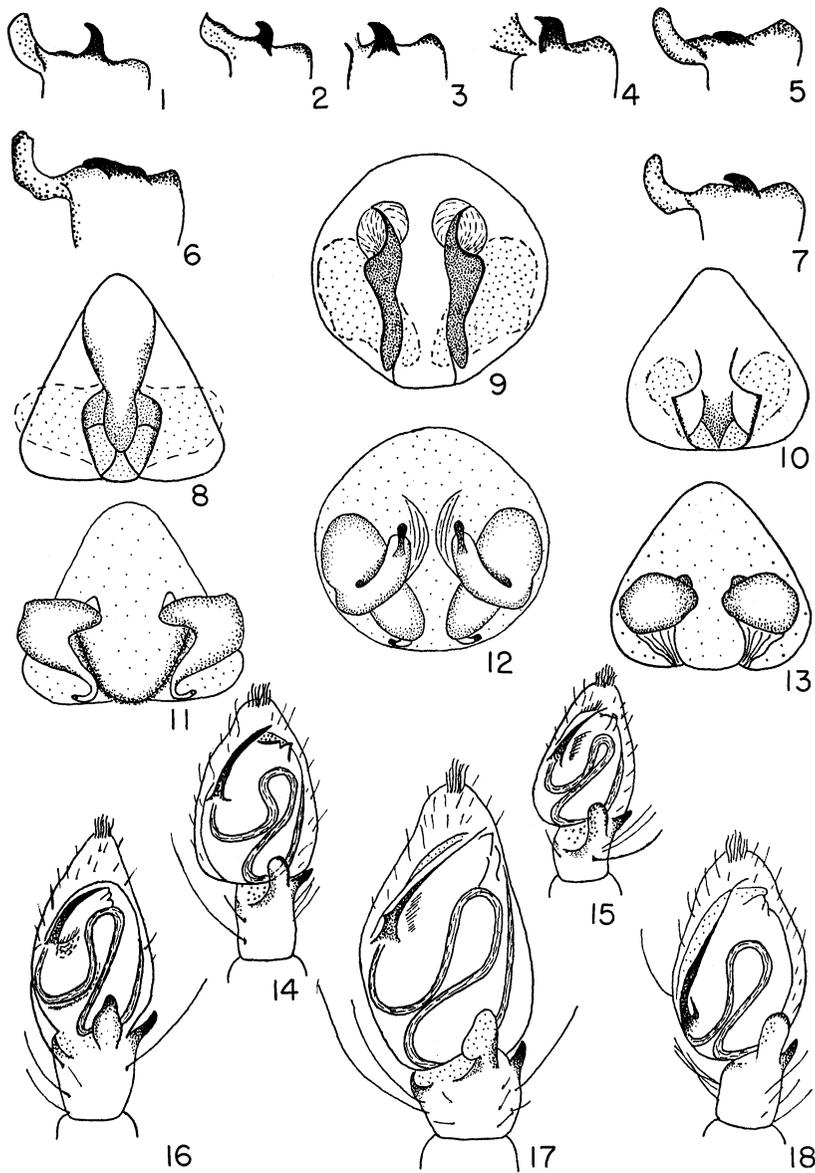
Description. Male: total length 3.20 mm; cephalothorax 1.60 mm long and 1.56 mm wide; femur II 2.28 mm long; ocular quadrangle 0.28 mm long and 0.49 mm wide. These measurements and the description that follows are taken from the type male. Carapace distinctly longer than wide, side margins abruptly constricted at the level of the posterior row of eyes; flattened in appearance, sloping gradually to the sides from the area of the dorsal groove; orange-yellow in color, with a thin white line at side margins and a pair of dusky, submarginal, longitudinal bands; pale median band indistinct, terminating anteriorly at the "cervical groove", which is marked by a white V. Eyes, except the anterior medians, seated on low, white tubercles. Legs orange-yellow. Dorsum of abdomen yellow-white, with a thin coat of shiny scales. Venter off-white.

Tibia of palpus slightly longer than wide, approximately the same thickness throughout; lateral apophysis shorter than the ventral, about as wide as long, with a short point on the lower corner (Fig. 4). Embolus slender and somewhat sinuate, arising proximally on the prolateral margin of the tegulum (Fig. 18).

Female: The female is described here for the first time. The following measurements are from a single female: total length 4.00 mm; cephalothorax 1.69 mm long and 1.64 mm wide; femur II 1.76 mm long; ocular quadrangle 0.28 mm long and 0.54 mm wide. Carapace similar in shape and color to that of the male. Legs and abdomen colored as in male, but without abdominal scales. Median plate of epigynum sinuous along the sides (Fig. 9). Spermathecae elongate (Fig. 12).

Range. The species is represented only by the type male and a female collected in Brevard County, Florida, both of which are in the American Museum of Natural History.

Comments. *P. peninsulanus* is similar to *P. placidus*, as noted by Gertsch (1934) in his diagnosis of the former, but in *peninsulanus* the femora are shorter and the ocular quadrangle wider. In color,



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peninsulanus is a yellow-orange spider with none of the dark body and leg patterns found in *placidus*. The relationship between these two species is, however, complicated by the existence of a third form with slightly different external genitalia. It occurs along the coastal plain of the southeastern United States in Mississippi, northern Florida, Georgia, and Long Island, New York and thus coincides with the southern part of the range of *placidus*. It is allopatric with *peninsulanus*, according to present knowledge. Its main characteristics are a shorter embolus than in either of the other two forms and a shorter and wider median epigynal plate and round spermathecae. Too few specimens of the three forms were available from the south-east to permit assessment of these differences.

Philodromus marxi Keyserling

Synonymy. See Kaston (1948), Roewer (1954), and Bonnet (1958).

Description. See Kaston (1948).

Range. Northeastern Mexico to Florida, north to Minnesota, northern New York, and Massachusetts.

Florida Localities. Liberty County; Quincy; Gainesville; Volusia County; Tarpon Springs; Tampa; Clearwater; Terreya State Park; Punta Gorda.

Comments. *P. marxi* can be distinguished from related forms by the basal origin of the embolus on the tegulum, the small, erect lateral apophysis on the male palpal tibia, and by the copulatory duct of females, which is wound once around the spermatheca. This species is almost identical to the type male of *P. undarum* Barnes (1953), and differs from it only in the shape of the lateral apophysis of the male palpal tibia. In *undarum* this apophysis is drawn out to a fine point, and is inclined toward the cymbium (Barnes, 1953, Fig. 14).

Philodromus imbecillus Keyserling

Synonymy. See Kaston (1948), Roewer (1954), and Bonnet (1958). *Philodromus emertoni* Bryant, 1933, Bull. Mus. Comp. Zool. Harvard College 74:184. NEW SYNONYMY.

EXPLANATION OF PLATE 3

Figs. 1-7. Lateral apophysis of male palpal tibia. 1. *P. satullus* (New Jersey). 2. *P. bilineatus*. 3. *P. floridensis*. 4. *P. peninsulanus* (holotype male). 5, 6. *P. montanus* (Florida). 7. *P. montanus* (North Carolina).

Figs. 8-13. Epigynum of female. 8. *P. floridensis* (external view). 9. *P. peninsulanus* (external view). 10. *P. bilineatus* (external view). 11. *P. floridensis* (internal view). 12. *P. peninsulanus* (internal view). 13. *P. bilineatus* (internal view).

Figs. 14-18. Palpus of male, ventral view. 14. *P. floridensis*. 15. *P. bilineatus*. 16. *P. satullus*. 17. *P. montanus*. 18. *P. peninsulanus* (holotype male).

Description. See Kaston (1948).

Range. Southern British Columbia to Labrador, south to Arizona and, in the east, to Texas and Florida.

Florida Localities. Blountstown; Leon County; Gainesville; Enterprise; Newman Lake; Clara; Ona.

Comments. A study of Bryant's type series of *P. emertoni* from New Bern, North Carolina, deposited in the Museum of Comparative Zoology, indicates that *emertoni* is identical with southeastern specimens of *imbecillus*. Gertsch's (1934) synonymy of *emertoni* and *mineri* Gertsch is open to doubt, unless, of course, Gertsch considers *mineri* to be synonymous with *imbecillus*. *P. mineri* is a rare form known only from a male collected in the Michigan peninsula. It is very similar to *imbecillus*, but has the lateral apophysis of the palpal tibia longer and thinner, and the tibia itself more robust, than in most eastern specimens of that species.

Within the *rufus* group, *P. placidus*, *peninsulanus*, *marxi*, and *imbecillus* together form a distinct series based on the relative length of the male embolus and the corresponding length of the copulatory ducts in females. In *placidus* and *peninsulanus* the embolus arises at between one-quarter and one-half the distance from the base of the tegulum, and the female duct is short, with its point of communication with the spermatheca visible from the ventral side. In *marxi* the embolus arises at the base of the tegulum, and the female duct is long and makes a convolution about the spermatheca. The embolus of *imbecillus* attains the greatest length found in any of the species of *Philodromus*; it arises retrolaterally and nearly encircles the tegulum. The duct makes nearly two full turns around the spermatheca. In all of these forms a lobe arises at or near the point of communication between copulatory duct and spermatheca, and the males are clothed dorsally, at least on the abdomen, with shiny scales.

Philodromus montanus Bryant

Figures 5-7, 17

Synonymy. See Roewer (1954) and Bonnet (1958). *Philodromus mediocris* Gertsch, 1934, American Mus. Novitates 707: 20. NEW SYNONYMY.

Description. Male: total length 2.80 mm; cephalothorax 1.33 mm long and 1.28 mm wide. These data are from Gertsch's (1934) original description of *P. mediocris*. Carapace longer than wide, less convex over the top than in *P. satullus* Keyserling; lateral areas orange-brown; pale median area as wide as the posterior eye row, narrowed behind; a white V at the "cervical groove"; eyes ringed

with white, all except the anterior medians on low tubercles. Legs orange-yellow, paler below, with a well-defined prolateral black band from coxa to tibia on legs III and IV, and with fainter brown retrolateral bands. Width of the ocular quadrangle nearly twice the length. Abdomen diffuse reddish-brown, without definite markings; dorsum without scales; venter pale.

Tibia of palpus about as wide as long; lateral apophysis recumbent on the tibia (Figs. 5-7); ventral apophysis constricted at base, rounded apically (Fig. 17). Embolus about half the length of the tegulum, nearly straight, and with an angular projection on the prolateral side near its base.

Female. Unknown. Bryant's (1933) allotype female of *montanus* from the Black Mountains of North Carolina matches southern females of *satullus* in size, shape, color and in the epigynum, and is therefore believed to be of that species. Gertsch (1934) also included a female in his type vial from Lake City, Florida, although this was not included in his description of *mediocris*, and no characters were found for separation of this female from females of *satullus*. Further work is needed before the female of *montanus* can be properly diagnosed.

Range. Southeastern United States.

Florida Localities. Lake City; Gainesville.

Comments. *P. montanus* is very similar to the more widespread species *P. satullus*, but males of the two can be separated by the less convex carapace, the unusual embolus, and the recumbent lateral apophysis of the palpal tibia in *montanus* (compare Figs. 1, 16 with 5-7, 17). These species are apparently sympatric, males of *satullus* having been collected as far south as Georgia. The types of the southeastern species *P. inaequipes* Banks (1900), two females from Washington, D. C., appear also to be specimens of *satullus*, as they match females of the latter species in detail, but there remains the possibility that they are instead the females of *P. montanus*. The only description of the male of *inaequipes* (Bryant, 1933) definitely refers to *satullus*.

The synonymizing of *montanus* and *mediocris* is based on a comparison of the type males of both species. The type of *montanus* is in the Museum of Comparative Zoology, and of *mediocris* in the American Museum of Natural History, New York. The cotypes of *inaequipes* are also in the Museum of Comparative Zoology.

P. montanus is one of four forms that comprise a distinct series. In common with *satullus*, *floridensis*, and *bilineatus* it has a conspicuously wide ocular quadrangle and black-banded legs. The posterior

lateral eyes in the members of the series are set on or very close to the carapace margin, and in *bilineatus* the anterior laterals are also on the margin. The embolus in males is relatively short as compared with that of the *placidus-peninsulanus-marxi-imbecillus* series, and the copulatory duct of females is correspondingly short and inconspicuous. Mature males lack shiny scales.

Philodromus floridensis Banks

Figures 3, 8, 11, 14

Synonymy. See Roewer (1954) and Bonnet (1958). *Philodromus deceptus* Gertsch, 1934, American Mus. Novitates 707:21. NEW SYNONYMY.

Description. Male: total length 3.12 mm; cephalothorax 1.40 mm long and 1.39 mm wide; femur II 1.34 mm long; ocular quadrangle 0.25 mm long and 0.50 mm wide. The measurements were made from the type male of *deceptus*; no other males were available for study. Carapace depressed at the "cervical groove", which is marked with a white V, and highest behind the middle; lateral areas reddish-brown; pale median band as wide in front as the second row of eyes, narrowing posteriorly. Eyes set well apart, the posterior laterals situated at the carapace margins, all ringed with white, and, except the anterior medians, seated on low tubercles; a pair of short, longitudinal brown lines within the ocular quadrangle. Legs yellowish with irregular brown markings at middle of the femora and at the ends of most of the segments; a brown to black prolateral band extending from coxa to tibia, most noticeable on legs III and IV; fainter retrolateral bands on all legs. Dorsum of abdomen white to orange on anterior two-thirds, with a grey heart-shaped mark that is bordered with dark brown; four or five chevrons of various shades of brown to orange posteriorly, alternating with white. Venter pale with three narrow longitudinal bands that coalesce apically.

Tibia of palpus about one and one-half times longer than wide, nearly uniform in thickness throughout; lateral apophysis a short, curved hook (Fig. 3). Embolus short and curved, arising slightly distad of the middle of the tegulum (Fig. 14).

Female: total length 3.84 ± 0.39 mm; cephalothorax 1.55 ± 0.13 mm long and 1.50 ± 0.13 mm wide; femur II 1.71 ± 0.19 mm long; ocular quadrangle 0.29 ± 0.02 mm long and 0.55 ± 0.05 mm wide. These data are the means and standard deviations from a sample of 15 females. Carapace and abdomen generally paler than in the male. Median plate of epigynum U- or V-shaped, with a thickened, sword-shaped middle piece attached anteriorly and extending about two-

thirds the length of the plate (Fig. 8). Spermathecae rather slender, situated anterior to the genital groove (Fig. 11).

Range. Southeastern United States and possibly northeastern Mexico.

Florida Localities. Royal Palm Park; Miami; Lake Worth; Dunedin; Leesburg, Lake County; Edgewater; Gainesville; St. Augustine; Blount's Ferry.

Comments. *P. floridensis* has been known heretofore only from Banks' (1904) type females, which were collected at Lake Worth, Palm Beach County, Florida. These specimens, which are deposited in the Museum of Comparative Zoology, have a rather unusual color pattern, and examination of the males of all known Florida species of *Philodromus* shows that the type male of *P. deceptus* Gertsch is the only one with the same pattern. The type male of *deceptus* is in the American Museum of Natural History, New York, and was collected at Gainesville, Florida.

P. floridensis can be separated from *P. satullus* and *P. montanus*, to which it is very similar, by the depressed "cervical groove" area, the placement of the posterior lateral eyes on the carapace margin, and larger size of *floridensis*. Although the body shape is quite distinct from that of *P. bilineatus*, which is an elongate, striped species, Bryant (1933), for some unspecified reason, indicated a female of *floridensis* as allotype of her new species *bilineatus*.

Philodromus bilineatus Bryant

Figures 2, 10, 13, 15

Synonymy. See Roewer (1954).

Description. Male: Measurements from two males were as follows: total length 2.40, 3.08 mm; cephalothorax 1.14, 1.16 mm long and 0.96, 1.04 mm wide; femur II 1.44, 1.40 mm long; ocular quadrangle 0.22, 0.21 mm long and 0.55, 0.52 mm wide. The first measurement given for each character is from the type male of *bilineatus*. Carapace roughly rectangular in dorsal view, much flattened; lateral areas yellow-orange, with a narrow white band along margin and a pair of orange-brown submarginal bands extending from the posterior lateral eyes to the posterior margin. Eyes ringed with white; lateral eyes of both rows placed on the carapace margins and seated on low tubercles. Legs orange-brown to yellow, III and IV with a narrow black prolateral band from coxa to tibia; all legs with indistinct brown retrolateral band; tibiae and basitarsi I and II each with three pairs of ventral spines, the distal pair on each segment apical and small; femora unarmed except for one prolateral spine near the middle of

the segment on leg I. Abdomen elongate and narrow, tapering from front to rear; pale above and below, with a pair of submarginal brown bands along the sides.

Tibia of palpus about equal to patella in length, approximately uniform in thickness. Lateral apophysis a small, erect hook (Fig. 2). Ventral apophysis slightly longer than the lateral apophysis, rounded apically (Fig. 15).

Female: total length 3.82 ± 0.37 mm; cephalothorax 1.40 ± 0.07 mm long and 1.15 ± 0.07 mm wide; femur II 1.53 ± 0.12 mm long; ocular quadrangle 0.25 ± 0.011 mm long and 0.63 ± 0.015 mm wide. These data are the means and standard deviations from a sample of nine females. Shape and color as in the male. Tibiae I and II spined as in the male, but some specimens with one or two additional pairs of weak spines in the distal half. Basitarsal spination as in the male. Femur I with from none to four weak dorsal spines and one or two prolaterals. Abdomen colored as in the male, but not tapered. Median plate of epigynum U-shaped with a sword-shaped piece extending over it from in front (Fig. 10). Spermathecae oval, situated well in front of the genital groove (Fig. 13).

Range. Florida south of approximately 28° north latitude.

Florida Localities. Dunedin; Royal Palm Park; St. Petersburg; Mallet Key; Lake Placid; Fish Eating Creek, Glades County.

Comments. Gertsch (1933) erected the new genus *Tibellomimus*, the type of which was *T. lineatus* Gertsch, for this species. His publication was followed closely by Bryant's (1933), however, in which both sexes of the same species were described as *Philodromus bilineatus*. Gertsch later (1934) recognized the synonymy of the two species, but retained the genus *Tibellomimus*. Roewer (1954) correctly cited the species as *Philodromus bilineatus*, *lineatus* being preoccupied in the genus *Philodromus*. The basic arrangement of the eyes and structure of the external genitalia relate this species to the *rufus* group, while its nearly rectangular carapace and elongate, striped body appear to be superficial modifications.

Acknowledgements

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