

females and egg sac (A.M.N.H.); Rancho del Cielo, 4200 ft., 5 females (A.M.N.H.); *Veracruz*: nr. Jalapa, Aug 1948, C. Goodnight, female (A.M.N.H.).

Life history.—We have examined males from March and May, females from March, May and July.

Ecology.—The only information we have is from a label, “ground-opening in jungle.”

Variation.—Five females from Tamaulipas have dark carapaces like *P. montanus*. A male has a carapace 2.3 mm long, 1.7 mm wide, a female 2.5 mm long, 1.8 mm wide. The male also has a carapace like *P. montanus*.

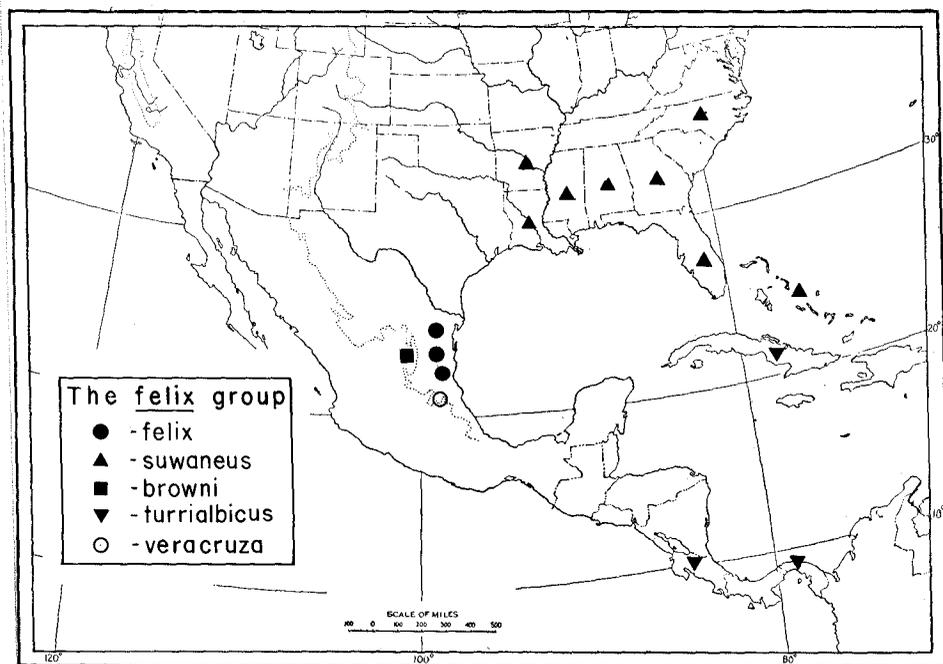
The spinning on tibia I and II in *P. pagicola* and *P. mayaca* is similar.

THE *FELIX* GROUP

The following species are very similar in appearance, genitalia and size and as a result are very difficult to separate: *P. felix*, *P. suwaneus*, *P. browni*, *P. veracruzae*, and *P. turrialbicus*, n. sp. *P. browni* and *P. suwaneus* have a submarginal light band on the carapace; the other three have wide marginal light areas. Unfortunately, the amount of pigment and the transparency of the carapace varies so that, for instance, specimens of *P. turrialbicus* from the same locality vary from very light ones with no annulae on the legs to pigmented individuals with carapace pattern that suggests the presence of a submarginal light area and legs with distinct annulae. So pattern is not always reliable.

Perhaps it is significant that no specimens identified as *P. browni* (Fig. 113) and *P. veracruzae* (Figs. 122-124) have turned up in the collections we have examined. For these two species only the holotypes are known. Both may be heavily pigmented *P. felix*. We propose to let these two species stand pending more thorough collecting in Mexico.

The epigynum of the type of *P. felix* (Fig. 109) appears to us to be identical with that of the allotype of *P. gratus* Gertsch and Davis and the two specimens agree in appearance,



size and morphology. In our opinion they are the same species. *P. turrialbicus* resembles *P. felix* in appearance and morphology, but their genitalia are different (Figs. 105-106, 117-118) and *P. turrialbicus* is a somewhat smaller species than *P. felix*. The palps of *P. felix*, *P. veracruzae* and *P. turrialbicus* are very similar; the palp of *P. felix* is slightly larger than that of *P. turrialbicus* (Figs. 111-112, 120, 123-124). *P. felix* and *P. turrialbicus* have wide marginal light bands or areas, but the lobes of the epigynum are more pointed in *P. turrialbicus*. *P. veracruzae* appears to have a submarginal light band, but the female is unknown.

The type of *P. felix* resembles the allotype of *P. suwaneus* in appearance (Figs. 105, 131) and the epigyna are very similar (Figs. 109, 132). However, we have found no males from Mexico with palpi like Florida *P. suwaneus* and therefore conclude that *P. suwaneus* and *P. felix* are distinct species.

Pirata felix Pickard-Cambridge

Figs. 105-106, 109

Pirata felix Pickard-Cambridge, O., 1898, Biol. Centr.-Amer., Arachn., Aran., 1:243; p. 33, figs. 6, 6a-d (female, Mexico, Atoyac, Vera Cruz, B.M.N.H., examined); Pickard-Cambridge, F., 1902, Biol. Centr.-Amer., Arachn., Aran., 2:330, pl. 31, fig. 23 (female, Guatemala).

Pirata gratus Gertsch and Davis, 1940, Amer. Mus. Nov., 1059:10, figs. 19, 21 (male, female, San Fernando, Tamaulipas, Mexico, A.M.N.H., examined). NEW SYNONYMY

Description of type.—In alcohol the basic color is amber with dark pigmentation producing a pattern on carapace and abdomen and annulae on all legs. Carapace with the usual tuning-fork pattern extending forward between the eyes and a ragged wide marginal light area each side which is invaded medially and laterally by irregular spikes of dark pigment. Dorsum dusky with a light hastate area over the heart, three light chevrons behind the heart region, and a light streak extending posterolaterally on each side from the anterior end of the abdomen. Sternum and coxae light amber colored, venter light with dark pigmentation medially on the posterior half.

Carapace 1.7 mm long, 1.2 mm wide; width of head opposite posterior median eyes 0.7 mm. Posterior ocular quadrangle 0.55 mm wide, 0.32 mm long. Anterior eye row slightly procurved, narrower than posterior median eye row; anterior eyes about equally spaced, anterior median eyes larger than anterior lateral eyes. Clypeus narrow, less than the diameter of an anterior median eye in height.

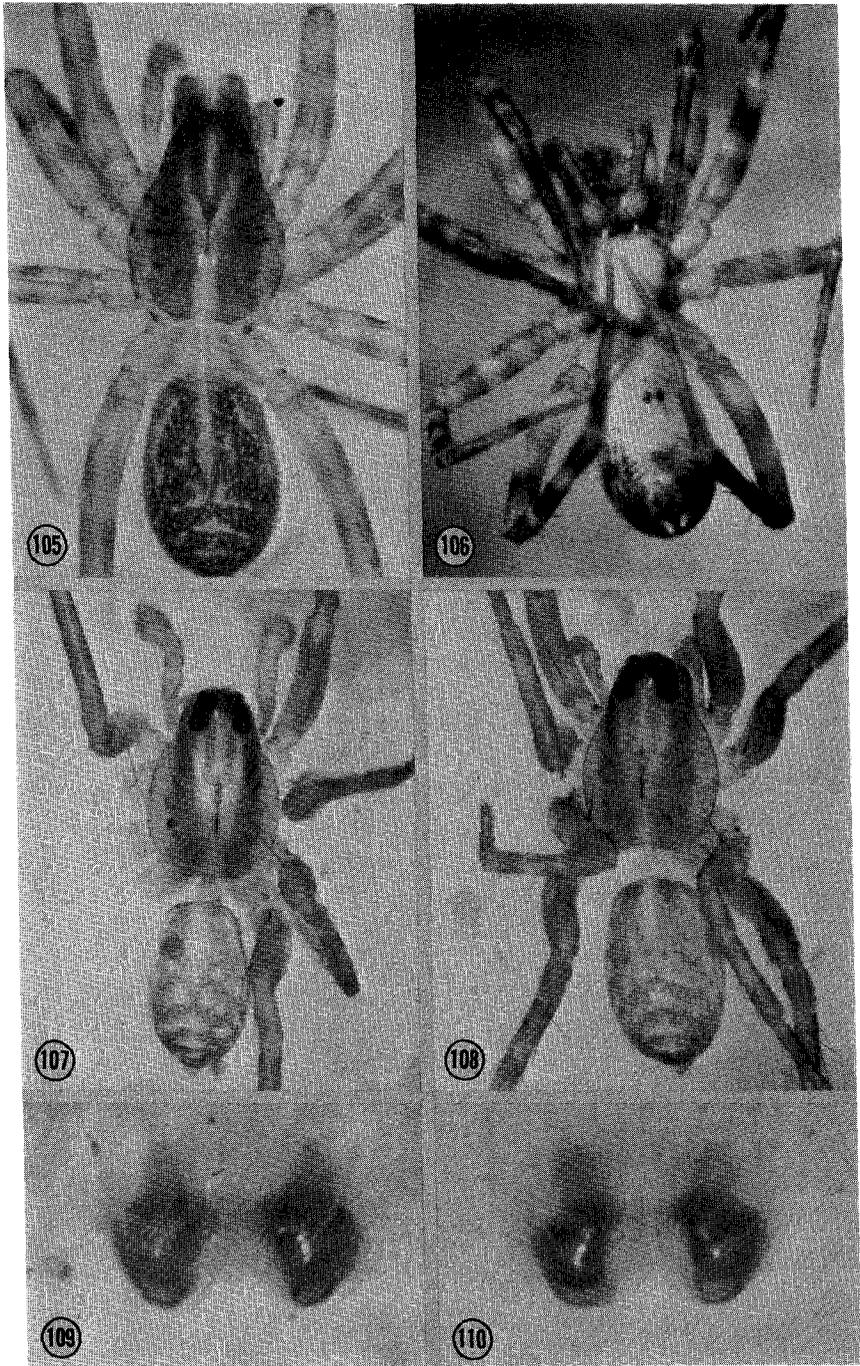
Lower margin of the furrow of chelicerae with three teeth, the one nearest the base of the fang quite small, transparent and inconspicuous; upper margin with three teeth, middle tooth much the largest.

Tibia I with five long overlapping ventral spines, three prolateral, two retrolateral.

Distribution.—México: Tamaulipas, San Luis Potosí, Veracruz.

Specimens examined.—México: *Veracruz*: Atoyac 573, H. H. Smith, female type (B.M.N.H.); *San Luis Potosí*: Apr. 16, 1965, J. Reddell, male (A.M.N.H.); *Tamaulipas*: San Fernando, Mar. 28, 1937, L. I. Davis, male (holotype of *P. gratus* Gertsch and Davis, A.M.N.H.) and male and 5 females (A.M.N.H.); 1 mi. S.W. Villa Juárez, Apr. 17, 1938, L. I. Davis, female (allotype of *P. gratus* Gertsch and Davis, A.M.N.H.).

Ecology.—Nothing has been recorded.



Figs. 105-106.—*P. felix*: 105, female type, Mexico, Vera Cruz; 106, female type, ventral surface.

Figs. 107-108.—*P. gratus* (= *P. felix*): 107, holotype male, Mexico, Tamaulipas, San Fernando; 108, allotype female, Mexico, Tamaulipas, San Fernando.

Fig. 109.—*P. felix*: Female type, epigynum.

Fig. 110.—*P. gratus* (= *P. felix*): allotype epigynum.

Remarks.—The figures given by the Cambridges for the epigynum of *P. felix* are quite different. The figure in volume I is poor and does not resemble anything we have seen from Mexico or Central America. The figure of the epigynum in volume II resembles that of specimens from Turrialba and of the allotype of *Pirata gratus* Gertsch and Davis from Veracruz. If the type of *P. felix* was not available one could not be certain of the relationship of these two populations to *P. felix*.

Pirata browni Gertsch and Davis

Figs. 113-114

Pirata browni Gertsch and Davis, 1940, Amer. Mus. Nov., 1059:9, fig. 18 (female, Rio Gualolejo, Tamaulipas, Mexico, A.M.N.H., examined).

Remarks.—The holotype is a well pigmented female with a distinct submarginal light band on the carapace and annulae on the legs (Fig. 113) and a carapace that measures 1.7 mm long, 1.2 mm wide, putting it in the size range of *P. turrialbicus* and *P. felix*. It differs from these two in pattern and from the former in shape of the epigynum (Fig. 114). The epigynum is also different from that of *P. felix* in that the lobes do not project as far posteriorly; it has some resemblance to that of *P. sedentarius* and *P. suwaneus*.

We have found no specimens which we could place in this species, but believe the species should stand pending additional collecting in the Tamaulipas and Veracruz areas.

Pirata turrialbicus, n. sp.

Figs. 115-121

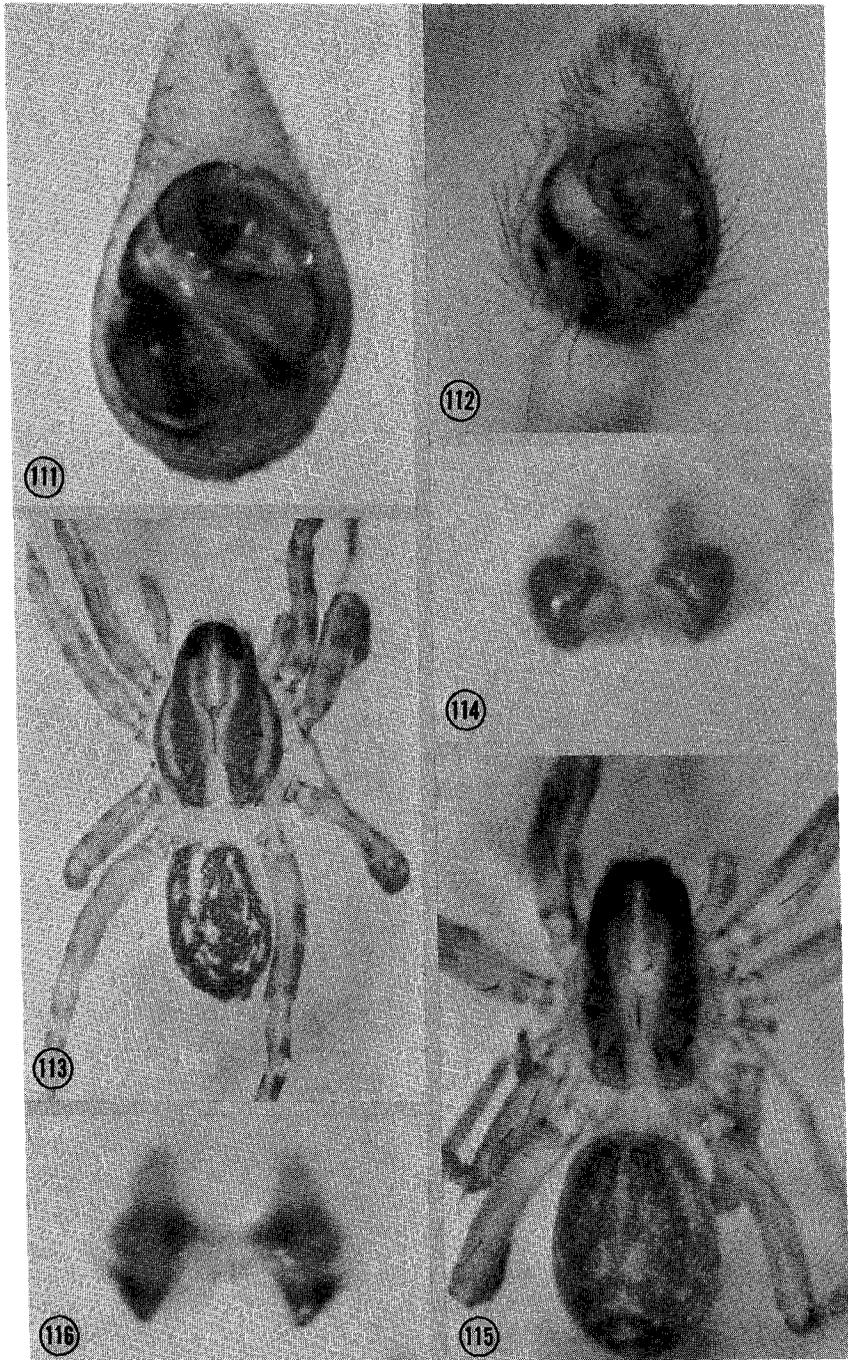
Holotype.—Female, from Turrialba, Costa Rica, 25 July-15 Aug. 1965, A. M. Chickering (M.C.Z.).

Allotype.—Male, with same data (M.C.Z.).

Diagnosis.—This species is close to *P. felix* Cambridge, *P. suwaneus* Gertsch, *P. veracruzae* Gertsch and Davis, and *P. browni* Gertsch and Davis. The latter two are known only from the holotypes and may be examples of *P. felix*. *P. suwaneus* differs from *P. felix* and *P. turrialbicus* in having a submarginal light band on carapace and resembles *P. browni* and *P. veracruzae* in this respect. The epigyna of these species are very similar, but the range of variation in the series, while small, is sufficient to cause confusion. A typical *P. turrialbicus* epigynum from Costa Rica is different from a typical *P. suwaneus* epigynum from Florida or a *P. felix* epigynum from Mexico. In the former the lobes are rather sharply pointed posteriorly, heavily pigmented at the tips and straight or concave laterally while in the latter two the lobes are not as pointed, are not pigmented at the tips, and are convex laterally (Figs. 109, 116, 118, 132).

P. browni resembles *P. suwaneus* from Florida in pattern, but the lobes of the epigynum do not possess the posterior projections of the others.

The median apophysis (Figs. 129-130, 133) of *P. suwaneus* is quite different from that of *P. felix*, *P. turrialbicus*, and *P. veracruzae* in that the distal and proximal teeth are about the same size, while in the others the distal is larger than the proximal. The palpi of the "other" three are very similar (Figs. 111-112, 120, 123-124).



Figs. 111-112.—*P. gratus* (= *P. felix*): 111, paratype, palp, Mexico, Tamaulipas, San Fernando; 112, holotype, palp, Mexico, Tamaulipas, San Fernando.

Figs. 113-114.—*P. browni*: 113, holotype female, Mexico, Tamaulipas, Rio Gualolejo; 114, holotype, epigynum.

Figs. 115-116.—*P. turrialbicus*, n. sp.: 115, female, Cuba, Soledad; 116, epigynum, Cuba, Soledad.

Description of holotype.—Total length 3.0 mm. Carapace 1.55 mm long, 1.17 mm wide with the usual tuning-fork pattern. Basic color pattern amber, carapace with a wide marginal light band. Sternum immaculate, venter faintly dusky medially. Anterior eye row narrower than the posterior median row, slightly procurved, anterior median eyes slightly closer to anterior lateral eyes than to each other, diameter of anterior median eyes almost twice that of anterior lateral eyes; clypeus equal to diameter of anterior median eyes. Lower margin of chelicerae with three teeth, median the largest.

Legs 4123, very faintly annulate. Tibia I with long overlapping ventrolateral spines, three prolateral, two retrolateral. Metatarsus I with three pairs of long spines.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palpus	0.52	0.30	0.37		0.47	1.66
Leg I	1.20	0.52	0.97	0.97	0.45	4.11
Leg II	1.10	0.50	0.80	0.82	0.45	3.67
Leg III	1.00	0.45	0.72	0.95	0.47	3.59
Leg IV	1.45	0.53	1.23	1.48	0.57	5.26

Description of allotype.—Total length 1.5 mm. Carapace 0.78 mm long, 0.58 mm wide with the usual tuning-fork pattern. Color and pattern similar to holotype. Anterior eye row narrower than the posterior median row, procurved, anterior median eyes about half again as large as anterior lateral eyes, anterior eyes almost evenly spaced. Clypeus equal to the diameter of an anterior median eye (Fig. 121). Lower margin of the furrow of chelicerae with three teeth, the median largest, the lateral quite small.

Legs 4123, faintly annulate. Tibia I with five overlapping ventral spines, three prolateral and two retrolateral, and one small prolateral apical spine. Metatarsus I with three pairs of long spines.

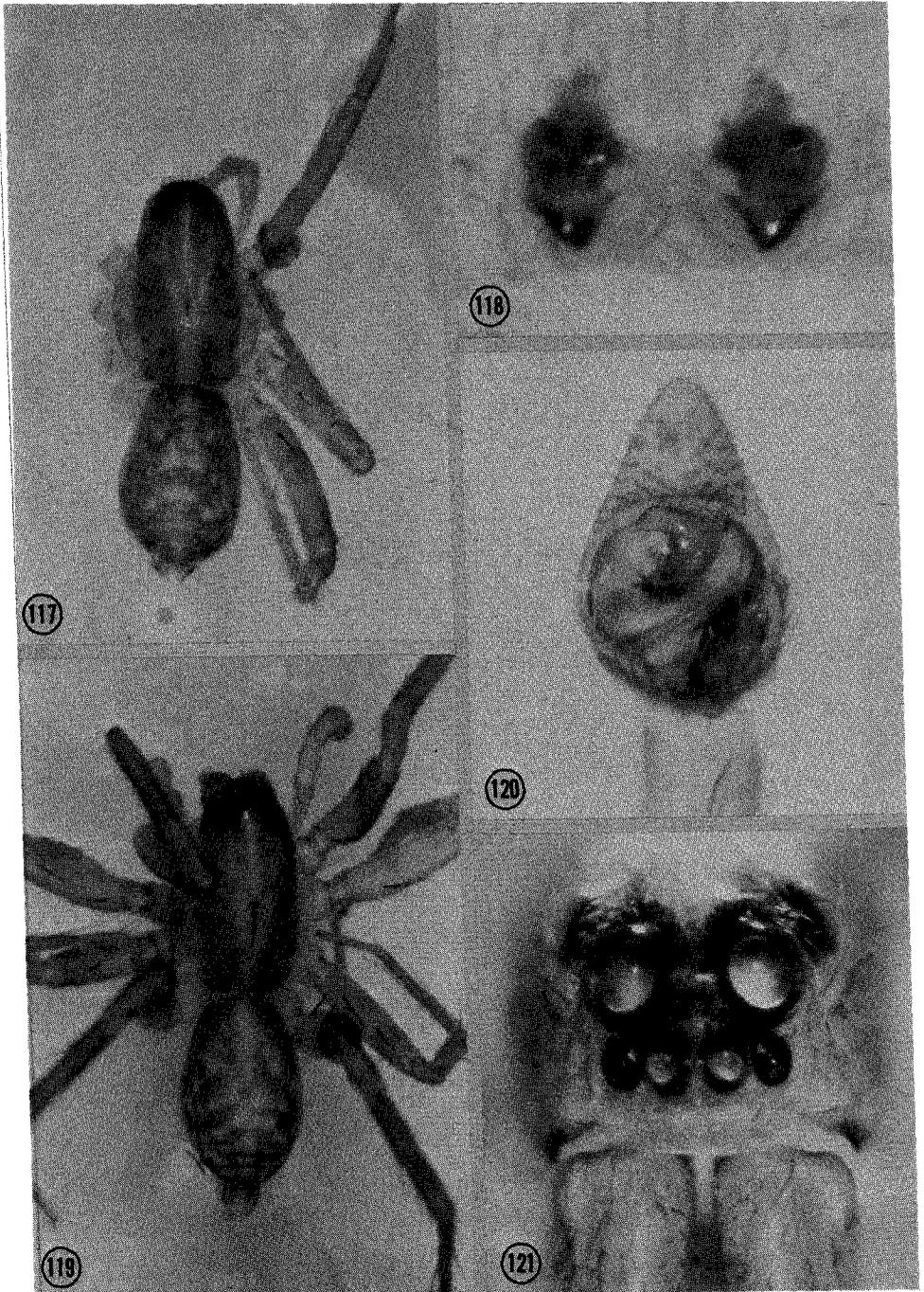
	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palpus	0.55	0.25	0.30		0.52	1.62
Leg I	1.22	0.52	1.05	1.10	0.55	4.44
Leg II	1.12	0.50	0.87	1.00	0.52	4.01
Leg III	1.13	0.47	0.77	1.00	0.47	3.84
Leg IV	1.50	0.53	1.52	1.55	0.60	5.70

Distribution.—Cuba, Costa Rica, Panama.

Specimens examined.—*Cuba*: Soledad, 31-VII-33, N. A. Weler, 1 female (M.C.Z.); Soledad, 1-11 Aug 1934, P. J. Darlington, 6 females (M.C.Z.); Soledad, Apr. 36, Darlington, male, female (M.C.Z.). *Costa Rica*: Turrialba, 23 July-15 Aug. 1965, A. M. Chickering, several hundred males and females (M.C.Z.); Turrialba I.I.C.A., 8 Mar. 67, W. Peck, 3 females (Exline); 1 Mar. 67, W. Peck, male, female (Exline); San Jose, Ciudad Universitaria, CEV 72, 4 females (U.C.R. 103). *Panama*: Boquete, Aug. 1-8, 1950, A.M.C., female (M.C.Z.); Chanquinola, July 65, J. P. Harrison, 3 females (Exline); Canal Zone, Forest Preserve, XII-24-57, A.M.C., 2 males (M.C.Z.); Canal Zone, Summit Gardens, May 64, A.M.C., male, female (M.C.Z.), XII-20-57, A.M.C., 5 females (M.C.Z.), July 26, 1954, A.M.C., female (M.C.Z.), Aug. 17, 1954, A.M.C., 2 males, female (M.C.Z.); Canal Zone, 3 miles N. Pedro Miguel, Aug. 23, 1954, 2 females (M.C.Z.); El Valle, July 36, A.M.C., 4 females (M.C.Z.); Canal Zone, Aug. 28, 1950, A.M.C., 5 females (M.C.Z.); Canal Zone, Ft. Clayton, Jan. 31, 58, A.M.C., female (M.C.Z.); Canal Zone, Gatun, Feb. 58, A.M.C., 2 males, 8 females (M.C.Z.).

Life history.—*P. turrialbicus* adults probably occur throughout the year. Gaps in the records are probably a reflection of collecting activities rather than an indication of seasonal occurrence. We have a male from Cuba in April and females in April, July and

August, and egg sacs in July and August; from Panama males in February, May, August and December, females in January, February, May, July, August and December, egg sacs in February and August.



Figs. 117-121.—*P. turrialbicus*, n. sp., Costa Rica, Turrialba: 117, holotype female; 118, holotype, epigynum; 119, allotype male; 120, allotype, palp; 121, allotype, eyes.

Ecology.—The only information available comes from labels in vials: “Pasture-Berlese;” “night-open lawn-pond margin;” “under trash, cleared forest;” “banana grove.”

Variations.—This small species is characterized by a wide marginal light area on carapace and faint annulae on the legs. Light specimens lack annulae and heavily pigmented specimens look like they have a submarginal band and distinct annulae on the legs. In a vial containing several hundred males and females from Turrialba lightly pigmented specimens are yellowish in color with a wide marginal light area and faint annulae on their legs. Heavily pigmented specimens have distinct annulae and pigment invading the marginal light area; these are similar to the type of *P. felix*. In this same vial one female with the marking of *P. felix* stood out because of its size: carapace 2.0 mm long by 1.5 mm wide, while typical *P. turrialbicus* measure 1.7 mm long by 1.2 mm wide. The epigynum of this specimen also resembles *P. turrialbicus*, the lobes being a little farther apart than in smaller specimens. This female is described separately below. We believe it may possibly represent a new species, but we prefer not to name it until it is verified by additional representatives including a male.

There is some variation in size. Males usually have a carapace length of less than 1.5 mm (range 1.3-1.6) and females less than 1.7 mm (range 1.4-2.0). There is also some variation in the appearance of the genitalia. The typical epigynum has a black tip on the lobes and appears to be concave in front of the tip; frequently this is true of one lobe, but not the other, sometimes depending upon the orientation of the specimen with reference to the optical path. In such cases the epigynum is very similar to that of *P. suwaneus*. The distal tooth or ramus of the median apophysis also appears to vary slightly in the length and shape, approaching *P. suwaneus* in bluntness on one extreme and *P. felix* in size and shape on the other.

Description of large female.—From Turrialba, 25 July-15 August. General body color dusky amber. Total length 5.0 mm. Some segments of legs faintly annulate. Carapace 2.0 mm long, 1.5 mm wide, with a wide marginal light area, medial edges of which are almost straight. The tuning-fork pattern is incomplete, the handle missing in front of the cervical groove. Dorsum with the usual hastate mark over the heart and several triangular shaped light areas on the midline posterior to the hastate pattern. Sides of abdomen with irregular blotches. Sternum, venter and coxae without markings.

Dorsal ocular quadrangle wider than long (0.67×0.50). Anterior eye row very slightly procurved, narrower than the posterior median row, anterior eyes evenly spaced; anterior median eyes larger than the anterior laterals. Height of clypeus slightly less than the diameter of an anterior median eye. Both tibiae I with three prolateral and two retrolateral long, overlapping ventral spines. Both tibiae II with three prolateral and two retrolateral spines ventrally, the latter long, overlapping, the prolateral about half as long as the retrolaterals. The distal prolateral spine is subapical. Legs 4123.

	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
Palpus	0.67	0.37	0.45		0.67	2.16
Leg I	1.50	0.70	1.25	1.25	0.70	5.40
Leg II	1.45	0.67	1.10	1.17	0.67	5.06
Leg III	1.42	0.60	1.00	1.25	0.70	4.97
Leg IV	1.80	0.75	1.60	1.92	0.85	6.92

Pirata veracruzae Gertsch and Davis
Figs. 122-124

Pirata veracruzae Gertsch and Davis, 1940, Amer. Mus. Nov., 1059:8-9, fig. 23 (male, Potrero, Vera Cruz, Mexico, A.M.N.H., examined).

Remarks.—The holotype is a dark specimen with a carapace pigmented somewhat like *P. montanus* (Fig. 122). However, a submarginal light band is faintly visible and in this respect it does not resemble *P. felix*, although photographs of the palp resemble that of *P. felix*. At the time the holotype was examined it was noted that the palpus resembled that of *P. sedentarius* (Figs. 123-124).

The carapace of the holotype measures 1.8 mm long, 1.3 mm wide, and the eyes are typical for *Pirata*, i.e., the anterior eye row is narrower than the posterior median row and slightly procurved; the anterior median eyes are larger than the laterals.

We have found no other specimens which we could classify as this species, but neither have we been able to place it with certainty as one of the described species. In view of the small amount of collecting done in the Veracruz area we believe it best to let this species stand.

Pirata suwaneus Gertsch
Figs. 125-133

Pirata suwaneus Gertsch, 1940, Florida Entomol., 23(2):20-21, figs. 1-2 (male, female, Port Mayaca, Florida, A.M.N.H., examined); Barnes, 1953, Ecol. Monogr., 23:315-337, figs. 1-17; Barnes, 1953a, Amer. Mus. Nov., 1632:1-21, figs. 1-19.

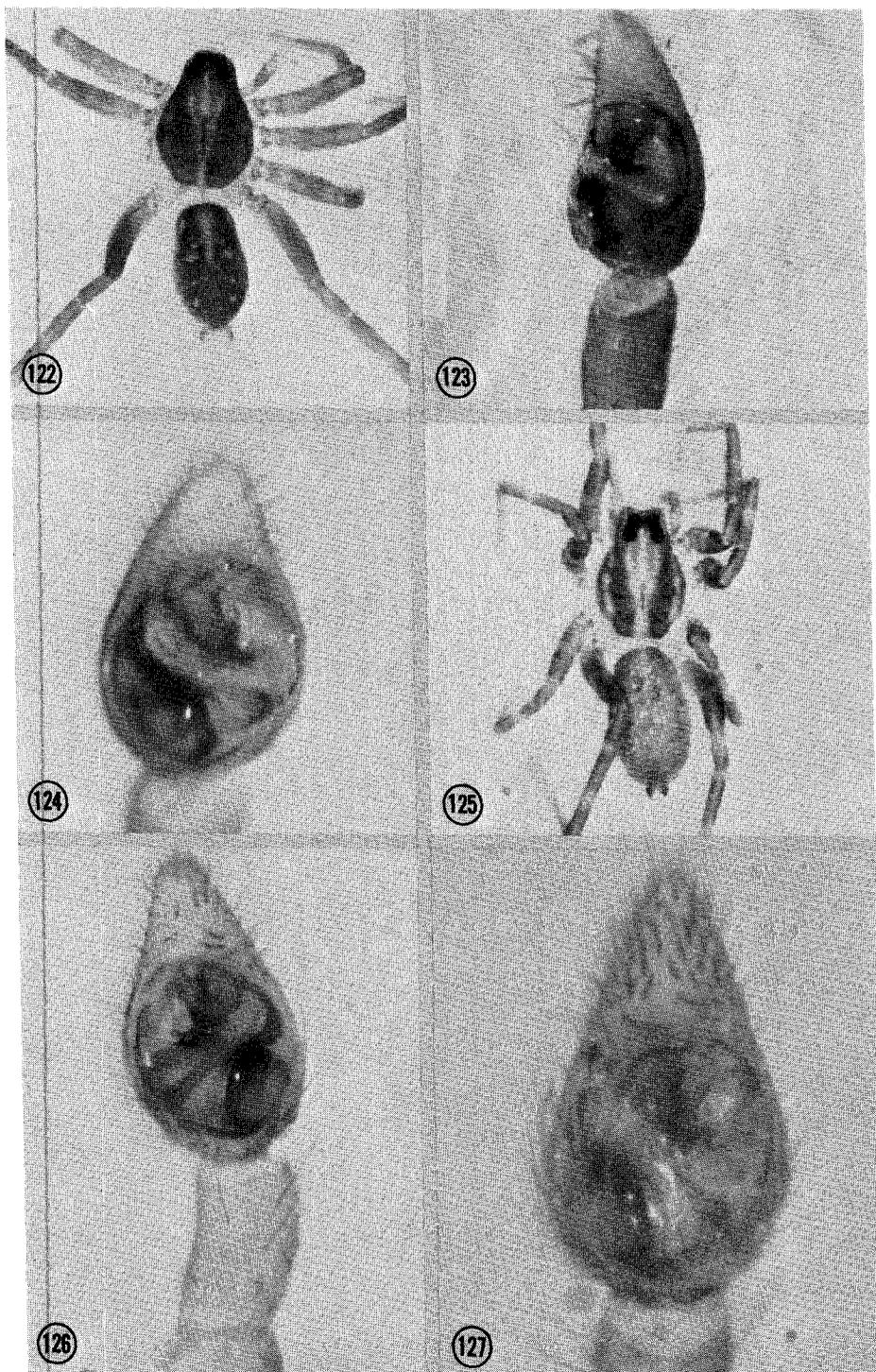
Observations on types.—Both sexes have a submarginal light band on the carapace, but the marginal pigment is not well developed, especially in the male (Figs. 128, 131). The carapace of the male holotype is 1.70 mm long, 1.07 mm wide. The anterior eye row is narrower than the median row, procurved; the anterior median eyes are twice as large as the laterals and closer to each other than to the laterals. The median apophysis of the palpus is small and chelate (Fig. 129).

The carapace of the allotype is 1.87 mm long, 1.30 mm wide. The eye arrangement is similar to that of the male. The epigynum has conical shaped structures projecting posteriorly beyond the epigastric furrow (Fig. 132).

Description of male.—From Palm Beach County, Florida, Canal Point, U. S. Sugar Corp., VIII-31-70, pitfall. Carapace 1.65 mm long, 1.22 mm wide, with a submarginal light band and the usual tuning-fork pattern. Dorsum heavily pigmented, with a light hastate mark over the heart. Sternum, coxae, labium and endites light amber colored without markings; venter similarly colored, but with pigment along the mid-line about one-third the width of the venter.

Anterior eye row distinctly procurved, distinctly narrower than the median row; anterior median eyes twice the size of the laterals, closer to the laterals than to each other. Clypeus height equal to the diameter of an anterior median eye. Lower margin of the furrow of the chelicerae with three teeth, the middle tooth the largest and closer to the lateral than to the median tooth.

Legs 4123, banded. Tibia I with seven ventral and lateral spines. The four ventral spines are long, overlapping the spines distal to them; one spine is apical in position. Tibia



Figs. 122-124.—*P. veracruzae*: 122, holotype male, Mexico, Potrero; 123-124, palp.

Figs. 125-127.—*P. suwaneus*: 125, Male, British West Indies, Crooked Island, Sept. 58; 126, palp, British West Indies, Crooked Island, Sept. 58; 127, Palp, Florida, Palm Beach Co.