An Introduction to the Tarantula Spiders of Trinidad, W.I.

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THE tarantula spiders are the largest of all spiders. The Brazilian species *Theraphosa leblondi* attains a diagonal leg span of over 25 cm.

The name "tarantula" refers to the large hairy *mygalomorph* spiders of the family Theraphosidae and can be found exclusively between the 40° latitudes around the world. These spiders should not be confused with the lycosid spiders, also called "tarantulas," in the Mediterranean region. Other names are given to the tarantulas. In Mexico and other Central American countries the tarantulas are known as *aranas peludas grande*, "giant hairy spiders," or *arãnas de caballo*, "horse spiders." The local people believe that if a tarantula bites a horse on the foot the hoof will fall off; in reality, the hoof drops off owing to a bacterial or fungal infection not caused by a spider bite. Their belief is supported by the fact that horse hair is found in the silk lip of the tarantula's ground burrow in pasture lands.

In Brazil, the tarantulas are called *carangueigeiras*, "bony-leg crab spiders" because of the appearance and gait of the male tarantula. In Argentina, the larger tarantulas are called *aranas pollitos*, "little chicken spiders" from the fact that they can prey on very small chickens. In Africa, they are called "monkey" or "baboon spiders" because of the resemblance of a monkey's velvet-bottomed, hairy, finger to that of a tarantula's leg. Similarly, in India, they are known as "cat-leg spiders" by the same analogy. The rest of the world where they are found simply knows them as "bird-eating spiders" or *mygales*. A few large arboreal species of tarantula have been seen by naturalists eating bats and very small hummingbirds, but on the whole, tarantulas are insectivorous. In capacity, where prey capture can be controlled, I have had tarantulas kill and eat live snakes, lizards, birds, rodents, frogs, fish, insects, and other arachnids.

For more than 40 million years the tarantula spider has virtually remained unchanged as can be seen by a few existing fossils. They have survived scores of natural enemies and geographical changes. Now, tarantulas are faced with the biggest threat to their existence man.

Tarantulas have unjustly earned the reputation of being deadly venomous, therefore they are killed on sight wherever they are found. In the United States, Canada, Great Britain, and Europe, large numbers of tarantulas are sold as exotic pets as they are long lived, easy to care for, mild in disposition, and bite only if teased or injured. This, combined with the heavy use of pesti cides and the transformation of jungles, deserts, and other undisturbed land for industrial and agricultural development, will rapidly make the tarantula a rare sight in the world.

Very little venom toxicity research has been done on tarantulas as a whole, but it would appear that the bite, though painful, is no more dangerous than a bee sting in most New World species. Most Old World species of tarantula on the other hand are nasty in disposition, very agile when disturbed, and have a stronger and more venomous bite, though not fatal if treated. I have never heard of a death that was due just to a bite of a tarantula, although I have heard of a few rare fatalities resulting from secondary infections of untreated tarantula bites in parts of East Asia. In Malaysia, the aborigines believe the only cure for a tarantula bite is to mash the tarantula up with herbs and leaves and past it over the wound. There are other unusual uses for tarantulas. Witch doctors of a West African tribe used tarantulas in a ceremony to tell the future or fate of another tribal member. Similarly, aborigines in Malaysia regard the tarantula as a messenger of one of their gods, and to harm one is to bring a disaster to a hunt, crops, or even one's own life. In Cambodia, Viet Nam, and Laos, the tarantula is not only a symbol of good luck but is used for medicinal purposes. The tarantula is mashed and mixed with herbs and juices, the mixture being either fried and eaten or allowed to ferment and drunk as a brew to remedy stomach ache and diarrhea. Aboriginal people throughout Africa and Oriental Australian regions use the tarantula as a valuable food source. The tarantula is prepared by killing it, removing the fangs, then skewering it on a stick and holding it over an open fire to remove the hair before cooking it.

Mygalomorph spiders are not like the majority of other spiders. They have paraxial or vertical movement of their chelicerae or jaws (See Fig. 1) unlike other spiders which have only sideways movement of their chelicerae like a pair of pincers. The chelicerae are attached to the front of the head in mygalmorph spiders, whereas in other spiders, the chelicerae are attached below the head. Mygalomorphs have eight eyes arranged on a tubercle on the head of the carapace. (Fig. 1) Most other spiders have one pair of book lungs while the mygalomorph spiders have two pairs, (Fig. 1) all with a single posterior slit, on the ventral surface of the abdomen. The venom glands of a mygalomorph spiders are harboured inside the chelicerae (Fig. 2c) but in other spiders they are found inside the head region. The mygalomorph spiders have a foveal groove on the carapace that may be procurved, transverse, recurved, or straight, but not longitudinal to the body axis as in most other spiders. (Fig. 1)

Theraphosids, or true tarantulas, may be distinguished from other mygalomorph spiders by the basic presence of claw tufts and tarsal scopulae on all four pairs of legs. (Fig. 2b) There are two pairs of spinnerets the anterior pair is small and unsegmented while the posterior pair is three-segmented with the last terminal joint long and stout. There is no "digging rake" or rastellum present on the chelicerae and the lip is free and moveable. There are normally two claws on each tarsus but in the theraphosid sub-family Selenocosmiinae there is a rudimentary third claw in some species. The foveal groove on the carapace is like other mygalomorphs, except for two genera *Sphaerobothria*, from Costa Rica, and *Ceratogyrus*, from South Africa, where a foveal horn protrudes above the carapace. The evolutionary purpose of this horn is unknown to me.

Tarantulas are separable into two sexes at maturity. Prior to sexual maturity however, males and females cannot be externally distinguished; both book and behave alike, living alone or in colonies in the ground.

Male tarantulas can be easily recognised from females at maturity. They are generally smaller in body size with long thin legs. On the tarsus of each pedipalp is a copulatory organ called an embolus. (Fig. 2a) This structure is important not only for breeding but for distinguishing genera and species from each other. On the tibia of the first pair of legs there are one or two curved spurs (Fig 2d) but not all species of tarantula males have this structure.

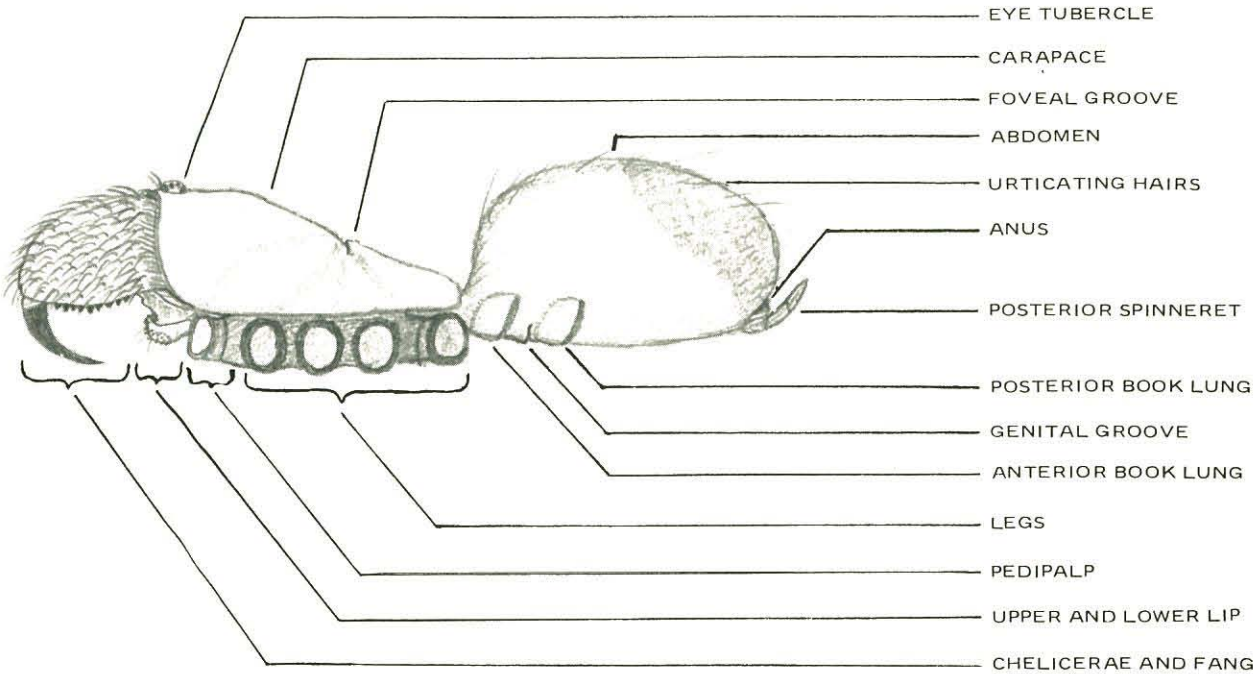

FIG. 1 A THERAPHOSID BODY

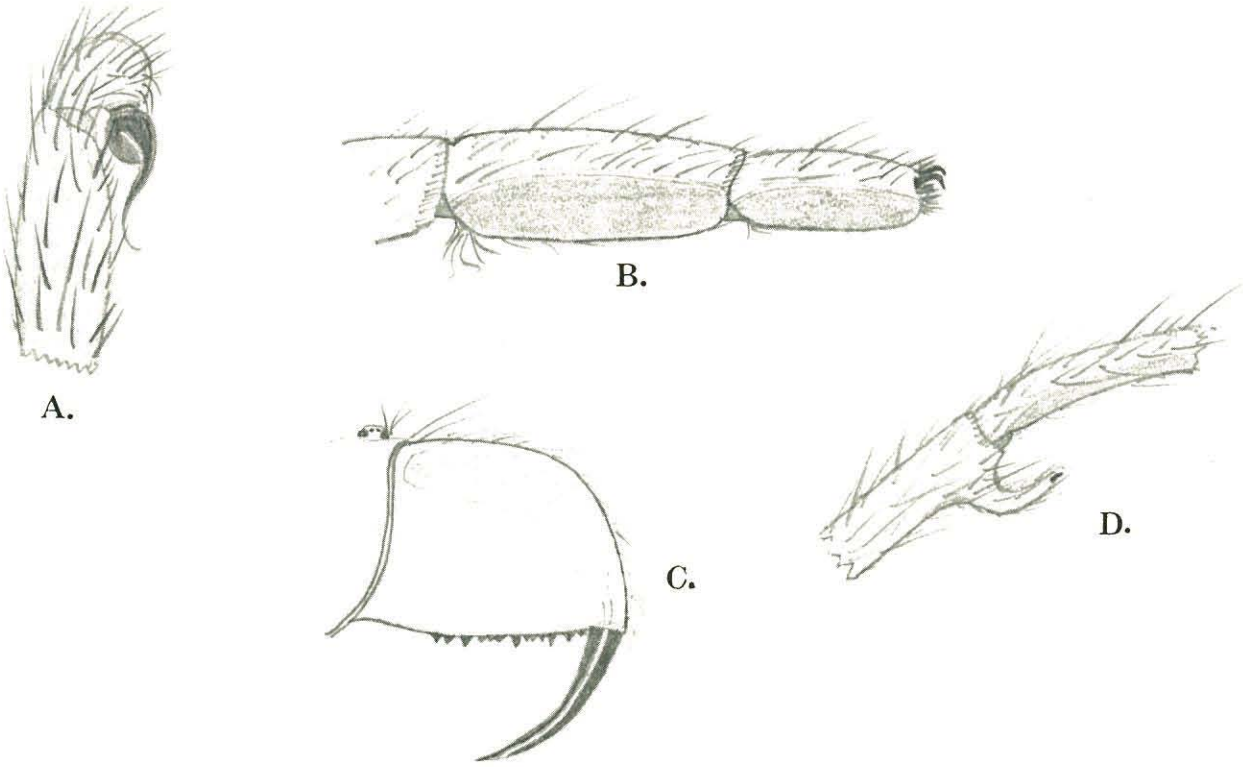

FIG. 2 A. MALE PEDIPALP WITH EMBOLUS

B. TARSAL AND METATARSAL SCOPULAE WITH CLAWS AND CLAW TUFTS.

C. VENOM GLAND AND VENOM DUCT

D. TIBIAL SPUR OF A MALE

Female tarantulas at maturity have no external genitalia. There is a genital opening found between the first and second pair of book lungs on the anterior ventral surface of the abdomen. (Fig. 1) Inside the genital groove are two chitinous seminal receptacles or spermathecae. The females are generally more robust in legs and body and are longer lived than the male tarantula. The males generally live for several months up to a year, whereas a female can live for several years and sometimes as long as 25 years.

Breeding of tarantulas takes place in most countries in the months of September through to December. The male tarantula constructs a sperm web either horizontal to the ground or at a 45 degree angle to it. The male crawls upside down under it and deposits spermatic fluid on the roof of this web. The male carefully crawls out and on top of the web, then reaches under with his pedipalps and with a drumming action fills his emboli by capillary action. Having charged these bulbs, the male sets off on a migration to locate a mature female of his own species.

The vision of a tarantula is very poor and the detection of a female is by chemoreception. Tarantulas are equipped with sensory hairs of various kinds that play a principal role in locating a female, prey, or an enemy. Male tarantulas can be seen wandering day or night in the forest, on highways, or in your house. When a male locates the burrow of a female he quivers and carefully entices her out. Mating is head on. The female rears bach with fangs spread. The male locks her fangs and arches her back with the spurs on the first pair of legs. This arching exposes the genital groove. The male rapidly beats his pedipalps on the sternum of the female and carefully inserts each embolus into the spermathecae discharging the seminal fluid. The mating can be brief with the insertion of only one embolu or it can be long with repeated insertion of both emboli. Having finished, the male carefully releases the female and flees for his life. Sometimes the male can be caught and devoured by the female either before or after mating. If the male escapes he generally constructs another sperm web and repeats the mating process.

After mating, the female will build a chamber either underground or in her arboreal silk tube. Layers of silk are laid down and depending on the species, anywhere from 40 to 500 yellowish eggs, about 1.5 mm in diameter, are deposited in the silk hammock. More layers of silk are deposited over the eggs then the whole mass is cut away from the chamber and rolled into a crude semi-spherical ball. More webbing is added later to strengthen the egg case. The egg cases vary in size, depending on the species, from 20 to 45 mm and are generally constructed in March through to May. Incubation varies from 18 to 60 days, again depending on species. During this time the females are very aggressive and ignore food, staying concealed in their chambers. The young hatch and stay with the female for protection until they are able to feed. They then rapidly disperse and remain solitary until they reach sexual maturity. Female tarantulas generally produce one egg case per year however, I did have female *Hapalopus incei* produce two egg cases a few months apart. Both were fertile.

In May of 1981, I came to study and collect tarantulas on Trinidad and Tobago for one month. My first two weeks were spent at the Simla Biological Research Station, four miles north of Arima on the Blanchisseuse Road, high in the northern mountain rainforest. Collecting by daylight produced four species of tarantulas, *Cyriocosmus elegans* (Simon), *Hapalopus incei* (F.O. Cambridge), *Psalmopoeus cambridgei* (Pocock), and *Tapinauchenius plumipes* (C.L. Koch). One important point should be made at this time and that is that the family Theraphosidae is in a chaotic taxonomic mess. Species names I have given in this article are taken from old taxonomic keys and to the best of my knowledge are the true species so named. I welcome any correspondence if someone disagrees.

Numerous specimens of *Hapalopus incei* (see back cover), some with egg cases, were found under boards lying on the ground or in ground burrows along the old bat building foundations at Simla. The burrows were about 25 cm in depth and lightly lined with silk webbing. Numerous specimens of this species were also found in silk lined burrows amongst the ferns, mosses, and vines on the vertical roadside banks near the top of the mountain range on Blanchissuese Road near the Textel Station.

The females of this species are about 27 mm in body length, the legs are olive brown, the carapace is dark brown with a brassy pubescence radiating from the foveal groove, the abdomen is light brown with six dark brown traverse bands on the dorsal surface extending down the sides and ending on the ventral sides of the abdomen. I did not find any males of this specees.

Numerous young specimens of *Psalmopoeus cambridgei* (back cover) were found in silken tubes in such places as the corners of the wire bat pens, in old pipes, hollow broken *Cecropia* tree branches, under the edges of the corrugated tin roof, in dry leaf piles, in clusters of bromeliads, and on the bare vertical rock cliffs at the higher altitudes along Blanchisseuse Road. The occasional immature specimen was observed wandering on the forest floor during the day apparently in search of food. Previous to this I thought only adult males migrated in search of females and that immature and female specimens led a sedentary life.

Psalmopoeus cambridgei is mainly arboreal. It grows to a large size, the average body length of a female being about 68.5 mm. The legs are covered in long feathery fringes and have wide scopulated pads which assist the spider to "float" with legs outstretched when jumping from danger, or when coming to the end of a bare branch, similar to that of the little salticid or jumping spiders.

The body colour of the immature and female specimens is as follows: legs are basically olive brown intermixed with olive green pubescence on the dorsal surface of the femurs. The ventral surfaces of the legs are dark brown and the scopulated pads are a rainbow of iridescent colours. Each tarsius and metatarsius has a rust-red stripe running longitudinally on its dorsal surface. The carapace is olive brown with a greenish grey pubescence, which is prominent in freshly moulted specimens. The first one-third of the abdomen is pale brown dorsally, while the remaining two-thirds is a darker olive brown. There is a narrow dark brown line that runs the full length of the dorsal surface of the abdomen and is transected by four distinct black bands ending on the ventral surface of the abdomen. The ventral surface of the abdomen and sternum are dark brown except around the fangs which are fringed with red setae.

The male of *Psalmopoeus cambridgei* has a totally different appearance from the female. This is unlike most other theraphosids where the males and females have the same characteristic patterns and colour. I found one specimen in a hollow *Crecropia* tree branch. Its description is as follows: body length about 35 mm; legs, abdomen, and carapace on the dorsal surface grey brown, the ventral surface dark grey brown. The oral fringe had red setae and the tarsus of each leg had a rust-red stripe running longitudinally. On the dorsal surface of the abdomen was a small dark grey-brown spot. I observed no males in the jungle.

One mature female and one immature specimen of *Cyriocosmus elegans* (Fig 3) were found under old boxes that were stacked against the old bat research buildings at Simla. These specimens were not caught on the same day and were not there on previous searches so they must have wandered the rainforest floor during the night and sought refuge there during the day.

Each had constructed a fine labyrinth of silk tunnels leading from the edge of the box for a distance of 30 cm under it. Total body length for the female was 16 mm, and for the immature specimen 13 mm. Their colour is as follows: legs are brown with the femurs being a lighter brown, carapace is an iridescent mahogany brown, the dorsal surface of the dark brown abdomen has three parallel-longitudinal rows of five light brown spots making a total of fifteen small spots. The ventral surface of the abdomen and sternum is a medium brown. Both these specimens died shortly after capture; they refused to eat and were very docile in captivity.

One male *Cyriocosmus elegans* (Fig. 4) was presented to me by Jack Price who found it wandering on the main grounds at Simla. The body length is about 12 mm. The dorsal surface of the

FIG. 3. A female Cyriocosmus elegans.

FIG. 4. A male Cyriocosmus elegans.

chelicera and cephalic region of the carapace are black while the remainder of the carapace has an orangey brown pubescence. The dorsal surface of the coxa and trochanter are orangey brown like the carapace, while the legs and pedipalps are dark grey.

On the dorsal surface of the patella running down to the tarsus of each leg is a narrow light grey longitudinal stripe. The dorsal surface of the abdomen is black with a small orangey brown "heart" shape. The ventral surface of the abdomen is beige brown with four bands of the same colour running vertically up each side ending in a point near the dorsal surface.

A few specimens of *Tapinauchenius plumipes* (back cover) were found at the lower altitudes along Blanchisseuse Road near the gravel quarries below the Simla Research Station grounds. These specimens were found under dead and hanging bark on old sapucaia nut and silk cotton trees in heavily silken burrows. More than once I got a thrill when, trying to secure a specimen from up high, it would run with rapid agility down my arm and body to the ground.

The body length of a mature female is about 40 mm. The body colour in females and near mature speicmens is as follows: the dorsal surface of the entire body is an iridescent mahogany brown, the abdomen being a little darker reddish brown. The legs are brown with reddish brown feathery fringes, characteristic of arboreal species, especially noticeable on the third and fourth legs. The ventral surface is black brown except for the red oral fringe of setae. A freshly moulted specimen in capitivity looks entirely different from a wild caught specimen.

A live gravid female of *Tapinauchenius plumipes* was sent to me by Julius Boos three years ago. Just before I came to Trinidad the offspring that I reared from her had begun to moult, some becoming males. Their full body length is about 25 mm. The colour is generally sooty grey, intermixed with a hint of red, yellow, and green iridescent hairs on the dorsal surface of the legs. The ventral body surface is dark grey except for the red oral fringe of setae. The male has the general appearance of a male *Psalmopoeus cambridgei* with the same dark brown small spot on the dorsal surface of the abdomen and the feathery fringes on the legs, and does not at all resemble the female in colour and pattern.

Two *Stichoplastus sanguinceps* (F.O. Cambridge) (Fig. 5) were found at the base of the old bat building foundations at night. These theraphosids sat poised at the edge of an unwebbed hole and if detecting any vibration quickly retreated. I caught one specimen which turned out to be a mature female. The total body length is about 28 mm. The carapace and dorsal surface of the coxa and trochanter are iridescent orange. The abdomen is all dark grey. I did not find any males of this species.

FIG. 5. A female Stichoplastus sanguinceps.

I spent the remaining two weeks in May at Turpin's Beach Resort in Charlotteville, Tobago. I did happen to find one specimen of *Psalmopoeus cambridgei* in a dead hollow root jutting out of the roadside bank near the old lighthouse, high on the eastern end of the Main Ridge Mountains but other activities prevented a thorough search on Tobago.

Other species of theraphosid spiders may occur in Tobago, perhaps the same as those of Trinidad, but I would not hazard a guess without a proper search for them.

I spent one day on Little Tobago Island, bird watching, and although I found centipedes, hermit crabs, and representatives of another family of mygalomorph spider I did not find any theraphosids. Again, one day is not adequate time to say for sure if they do or do not occur on the islands around Trinidad and Tobago.

Hans Boos has collected a few specimens of the large theraphosid spider, *Avicularia avicularia* (Lamarck) (back cover). These amboreal spiders live in large silken tubes on the sides of trees or old wooden buildings. Hans's specimens were found in the region of Maraval towards the base of the Northern Mountain Range. Other specimens have been seen in the higher altitudes of the

Chaguaramas region on Chacachacare and Monos Islands, in Maracas. Talparo and Rio Claro. In fact, *Aricularia* is widespread and quite common.

The total body length of a female was about 52 mm; the males varied greatly in body sizes, probably depending on the availability of their food in early development. The average body length was 35 — 45 mm.

Aside from the genitalia and breeding emboli on the male's pedipalps, both sexes appear generally the same in colour. In overall appearance the female is more robust while the male is more slender with longer legs. The dorsal and ventral surfaces are basically black. The carapace is covered in a woolly blue-green pubescence. The legs are black intermixed with a slight blue-green pubescence, especially noticeable on the dorsal surface of the femurs. The long setae on the legs are tipped white which is more prominent in the females than males. The tarsal tips of each leg are fringed with orangey red or pinkish hairs which vary in colour in different specimens. The legs are heavily scopulated with tarsal and metatarsal pads for climbing up smooth surfaces of bark, walls, or leaves.

This particular Trinidadian theraphosid spider has a secondary defence and that is to shed the fine dorsal abdominal hairs by rubbing its hind leg against them when irritated. These fine hairs cause great itching or urtication when coming into contact with a mammal's skin, especially the eyes or nostrils, leaving a rash for several days.

One other theraphosid was found in Trinidad in the drier forests of the Chaguaramas region. The specimen was collected and photographed by Mr. Joseph R. Dinardo in May, 1974. I did not have this epcimen in hand to study so I cannot hazard a guess from a photo as to what species it may be. There are also a few other described species of theraphosid spiders that do occur in Trinidad that I did not find, so have not covered them in this article.

I would like to express my thanks to Hans and Julius Boos, as well as Jack Price for their contribution of live theraphosids to make this article possible. My thanks to Joseph Dinardo for his photograph of the unknown theraphosid and to Mrs. Joanne Hamel for proof-reading and typing my manuscript.

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