

XXIV. NOTES ON ANT-LIKE SPIDERS OF
THE FAMILY ATTIDAE IN THE COL-
LECTION OF THE INDIAN MUSEUM.

By KARM NARAYAN, *M.Sc., Professor of Biology, St. John's
College, Agra.*

(Plate XXXII.)

The present paper describes the ant-like spiders of the family Attidae in the Indian Museum collection. Most of the specimens have been collected in Bengal, while a few from Ceylon, Madras and other places have also been described.

The work of identifying these spiders has been rather laborious, as the family Attidae has not been studied systematically in India so far. Mr. Gravely, in a recent paper (*Rec. Ind. Mus.* XI, p. 257, 1915), has called attention to the neglect which the study of spiders has met with in India. The remark applies much more forcibly to the Arachnomorph spiders than the Mygalomorphs. Pocock, in the "*Fauna of British India (Arachnida)*", omits the family Attidae altogether and says, "The group contains a vast number of species and is very imperfectly known—so imperfectly that no satisfactory account of it can at present be given." The most complete work on ant-like spiders is Peckham's "*Ant-like Spiders of the family Attidae*" published in 1892, but since then a good deal of work has been done and the literature added to. It is rather unfortunate that the literature relating to species of these spiders already described is extremely scattered and the descriptions are mostly brief and very often no diagrams are given. In certain cases immature specimens have been made the basis of new species. However, I have followed McCook who, in his book "*American Spiders and their Spinning Work*," says that the epigynum and male palpus are essential structures on which specific characters can be based with certainty and that immature specimens are not worth keeping in a collection. Consequently, I have not referred to any of the immature specimens that I came across in working out the collection, except those accompanied by adults. At the end of the paper I have put together most of the literature so far published on the species from the Oriental region of the two genera dealt with in this paper.

I have to thank my Professor, Lt.-Col. J. Stephenson, I.M.S., who very kindly obtained permission for me to work in the Indian Museum and also got a number of books for me from the research grant of the Government College, Lahore. My thanks are also due to Dr. Annandale and Mr. Gravely for their valuable sugges-

tions and kind help given while I was working at the Indian Museum.

Harmochirus lloydii, sp. nov.

(Plate xxxii, figs. 1a-c.)

The genus *Harmochirus* was first described by Simon (Faune Arachnologique de l'Asie Méridionale, *Bull. Soc. Zool. de France* X, 1885, p. 440), who named his species *Harmochirus malaccensis*. Peckham describes another species which he calls *H. albi-barbis* (Spiders of the *Homalattus* Group, Milwaukee, 1895). Still a third species has been described by Thorell as *H. brachiatus*.

It is a curious fact that in all these descriptions only ♂ spiders have been described. I have nowhere found any descriptions or diagrams of a female *Harmochirus*. The present description is based on a female specimen collected by Major R. E. Lloyd, I.M.S., from the Calcutta Medical College compound and preserved in the Indian Museum.

Measurements.

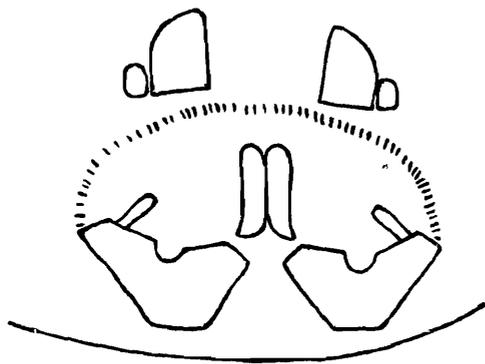
Total length 3·4 mm.

Cephalothorax: length 1·4 mm.; width at dorsal eyes 1·2 mm.; cephalic part 1 mm.

Legs 1423.

The cephalic part is moderately high, but a little lower than the abdomen. The thoracic part is very short and is on a sharp declivity behind the cephalic part. The eyes of the 2nd row are nearer the 3rd than the 1st row. The anterior eyes are directed forwards but the middle and dorsal eyes are situated on the sides. The interesting point about the chelicerae in this specimen (pl. xxxii, fig. 1b) is that, on the inferior margin from the ventral side, the right chelicera is *fissidentate* and the left is distinctly *unidentate* (cf. Simon, *Hist. Nat. Araign.*, vol. ii, p. 383), but Simon includes this genus in *Salticidae fissidentati*. The 'pièces buccales' are shown in pl. xxxii, fig. 1c, and the shape of the lower lip and the maxillary process of the palp are quite different from those of *H. brachiatus* (Simon, *Hist. Nat. Araign.*, vol. ii, p. 867).

The 1st leg has the characteristic shape shown in pl. xxxii, fig. 1a, with the femur compressed and much dilated, claviform, and the tibia disciform and subglobose. There are black stiff bristles on both edges of the tibia together with three special sharp spines dorsally as well as ventrally. The femur of the 2nd leg is compressed, while that of the 3rd leg, as also of the 4th leg, is cylindrical.



TEXT-FIG. 1.—Epigynum of *Harmochirus lloydii*, sp. nov.

The epigynum (text-fig. 1) consists of two dark-red tubercles

which are produced both antero-laterally and internally into short processes. There is also a median elongated tubercle which seems double at its anterior end. There is a sort of a "halo" or crown of short black hairs extending from the outer extremity of one tubercle to that of the other. Rows of hairs are also seen projecting inwards from the tubercles internal to the lateral margins of the "crown." In front of the epigynum are two yellowish-white areas as shown in the diagram.

Colour.—The cephalothorax is dark brown, the cephalic part being covered with small white hairs which are longest towards the anterior eyes; there is a fine row of white hairs on the inferior lateral of the cephalic part. The thoracic part occupies a trapezoidal area dorsally and is devoid of hair; its posterior edge is emarginate. The falcetes are medium brown.

The 1st leg is medium brown except the tibia which has a dark tinge. The metatarsus is lined with black. The remaining legs are yellowish-white. The femur of the 2nd leg has a dark brown line on its anterior side, while the tibia has a black line anteriorly. The femur of the 3rd leg is black-lined anteriorly and posteriorly and the tibia only anteriorly. Also the posterior half of the femur is black-lined anteriorly and posteriorly, but the tibia only posteriorly. The sternum and lower lip are dark brown but the maxillary process of the palp and chelicerae are light brown.

The abdomen is dull brown with very few white hairs. There is, however, a group of white hairs just behind the top of the anterior end of the abdomen, where it forms a white spot. There are yellowish-white punctate spots all over the abdomen; they are arranged in regular rows and lines, running, for the most part, antero-posteriorly. There are also a few gold-coloured spots on the dorsal side of the abdomen.

KEY TO THE SPECIES OF *Harmochirus*.

- I. Tibia thick but cylindrical, not flattened. No special spines besides those that are situated internally and externally on the tibia ... *H. albi-barbis* (♂).
- II. Tibia flattened, disciform and subglobose; 3 special spines dorsally and ventrally on the tibia.
 - A. Lower lip longer than broad; apex of the maxillary process of the palp directed outwards ... *H. brachiatus* (♂).
 - B. Lower lip broader than long; apex of the maxillary process directed inwards ... *H. lloydii* (♀).

The following characters mentioned by Simon for *H. malaccensis* are not found in this species:

"Cephalothorax supra valde clathrato-rugosa et sat dense fulvo-squamulata. Clypeus fere glaber parcissime cinereo-setosus. Scuto nigerrimo et nitidissimo supra obtectum. Pedes I nigro-aenei metatarsis tarsisque paulo dilutioribus. Femora nigricantia supra albo-lineata, tibiae metatarsisque obscure fulvi postici nigro-lineati."

Myrmarachne plataleoides, Camb. (♂)

Salticus plataleoides, Cambridge, *Ann. Mag. Nat. Hist.* (4) III, p. 68 (1869).

Salticus plataleoides, Peckham, *Ant-like Spiders*, 1892, p. 33.

Cambridge described this species from a single specimen in the Hope collection at Oxford, the habitat of which was unknown. He, however, confirmed his identification on receiving specimens from Ceylon. Peckham also describes the species from Ceylon. There are 5 specimens in the Indian Museum collection; their localities together with the names of collectors are given below:—

Peradeniya, Ceylon (*F. H. Gravely*).

Pusa, Bihar (*F. H. Gravely*).*

Sibpur, near Calcutta; 1894 (*T. H. T. Walsh*).*

Calcutta (*G. C. Chatterjee*).*

Calcutta (*F. H. Gravely*).*

Size.—These specimens vary from 6 to 7.5 mm. in total length; the falces are from 2 to 5 mm. long. In at least two specimens the falces exceed the length of the cephalothorax.

Simon says, "Anterior eyes are in a straight row", but in all the specimens, these eyes are a little recurved. The trochanter of the 4th leg is whitish and the posterior two-thirds of the abdomen ventrally and laterally is of a drab colour. There is a yellowish band in the mid-ventral line of the hinder two-thirds of the abdomen.

It is interesting to note that the tube containing the specimen collected by Mr. Gravely at Pusa also contains specimens of the ant *Oecophylla smaragdinea*, which the spider mimics. Dr. Annandale tells me that he has seen this or a very similar spider eating specimens of this ant.

Myrmarachne incertus, sp. nov. (♀)

(Plate xxxii, fig. 2.)

This species resembles in general shape and appearance *M. plataleoides* and was for some time mistaken for the latter by me, but there are important differences which justify its being placed in a different species. The following description, which embodies differences of this species from *M. plataleoides*, is based upon 3 specimens as given below:—

1. Calcutta (*N. Annandale*).
2. Pusa, Bihar (*F. H. Gravely*).
3. Pusa, Bihar.

Measurements.

	Total length.	Cephalothorax		Legs.
		(length).	(width).	
1.	7.1 mm.	3.2 mm.	1.4 mm.	4I32
2.	7 mm.	2.9 mm.	1 mm.	4I32
3.	8 mm.	3 mm.	1.5 mm.	4I32

* See note regarding these specimens under *M. incertus*, p. 397.

The thoracic part at its apex is almost as high as the cephalic, and not lower as in ♂ *M. platalaeoides*. The cephalic part rounds off behind the dorsal eyes but not so abruptly as in *M. platalaeoides*. In *M. platalaeoides* the thoracic part is almost flat dorsally but in this species there is a hump just in front of the middle. There is a sharp declivity in front of the hump, but it slopes gradually behind.

The constriction in the abdomen is not so well-marked as in *M. platalaeoides*; it may possibly be due to its being full of eggs.

The epigynum is characteristic (pl. xxxii, fig. 2) and serves to distinguish this species at once from the female of *M. platalaeoides*, the vulva of which has an entirely different structure and shape (cf. Peckham, *Ant-like Spiders*, 1892, plate iii, fig. 1C). The vulva here consists of two circular white spots between which lies the genital armature. This is formed of two club-shaped masses which are fused just opposite the circular spots but diverge a good deal posteriorly; they diverge a little anteriorly but soon converge again. Posteriorly, at the meeting point of the diverging flanks, there are 2 spine-like processes, one on each side.

Colour.—The colours are mostly the same as in *M. platalaeoides*, but the abdomen is yellowish-white and is covered all over with very small polygonal areas, flaky in appearance. In one of the specimens the abdomen is flat ventrally and is depressed in the middle line.

It is worthy of note that the specimen collected by Mr. Gravely at Pusa was found along with a ♂ *M. platalaeoides* and a few of the ants of the species *Oecophylla smaragdinea*. It is possible that *M. platalaeoides* and *M. incertus* are distinct in the female sex only, and that the males from Bihar and Bengal, which I have identified with the former species, belong in reality to the latter.

***Myrmarachne tristis*, E. Simon. (♀)**

(Plate xxxii, fig. 3.)

This species was first described by Simon in *Ann. Soc. Ent. France*, 1889, p. 115, but the description is based on a ♂ specimen. Peckham also describes the species but gives no diagrams of the epigynum or other ♀ characters, although he gives measurements of the ♀ type. I have found 3 females in the Indian Museum collection which I have identified as belonging to this species.

Calcutta (*F. H. Gravely*).

Madras.

Madras (*Prof. Ramunni Menon*).

Measurements.

Calcutta specimen.

Total length 6.2 mm.

Cephalothorax: length 3 mm.; width 1.4 mm.

Legs 4312.

Peckham's description of this species in "*Ant-like Spiders*" holds for these specimens. A few additional observations may, however, be added. The eyes of the 2nd row are situated about midway between the first and the 3rd rows; there are 7 teeth on the inferior and 4 on the superior margin of the falces; there are 4 pairs of spines on the anterior tibia and 2 pairs on the anterior metatarsus, while there are 3 pairs of spines on the tibia of the 2nd leg.

The 1st tibia is black-lined anteriorly and the femur posteriorly; similarly, the 2nd femur has a black line on its anterior margin. The abdomen is olivaceous with a dark band running across the middle of the posterior two-thirds of the abdomen, which is depressed ventrally.

The epigynum has a characteristic shape (pl. xxxii, fig. 3). There are two obliquely elliptical white areas, between which lie the chitinous genitalia. The latter consist of two halves which meet about midway but are separated anteriorly and posteriorly.

Myrmarachne laetus, Thorell.

Ascalus laetus, Thorell, *Spiders of Burma*, 1895, p. 320.

Synemosyna laeta, Thorell, *Ann. Mus. Genova XXV*, p. 339 (1887).

This is the commonest ant-like spider in India. The Museum collection contains 6 specimens of the male of this species, of which 3 were collected by Prof. Ramunni Menon at Madras, one by Mr. Gravely and another by Mr. L. L. Fermor at Calcutta, and the last has been obtained from the Nicobars.¹

One female specimen from Madras was collected by Prof. Ramunni Menon and another by Mr. Paiva from Katihar (Purnea district) in Bihar.

Measurements.

(Calcutta ♂ specimen).

Total length 7 mm.

Cephalothorax: length 3.1 mm.; width 1.5 mm.

Falces 2.1 mm.

Legs 4132.

The specimens agree in almost all essential features with the description given by Thorell; a few minor points brought out by the examination of the males may be noted here. It may be mentioned that I have compared these specimens carefully with an identified specimen of this species sent to the Indian Museum by A. S. Hirst from the Brit. Mus. collection.

The falces are divisible into two portions: a small basal portion from which the greater part of the falx is separated by a constriction. This basal portion is very prominent in some specimens, while in others it is sunk in the cephalothorax, but can be

¹ Since the above was written I have got three more ♂ specimens, one collected by Mr. Gravely at Calcutta, the other by Mr. Kemp at Port Blair (Andamans) and the third by Mr. Paiva at Katihar, Purnea (Bihar).

seen with a little difficulty. As regards the colour, the Indian specimens are darker than the Brit. Mus. specimen in the cephalic part, the falces and the abdomen.

***Myrmarachne laetus* var. *flavus*, n. var. (♂)**

A specimen, collected by Mr. Paiva at Katihar, resembles *M. laetus* very closely, but there are the following differences. The fang is devoid of a tooth in the middle which is present in *M. laetus*. As regards the colour, this variety is distinctly pale yellow. The falces are pale yellow, with a blackish patch on the dorsal surface. The cephalic part is black dorsally, but laterally it is light brown like the thoracic part. The abdomen is yellowish anteriorly but black in the posterior two-thirds.

***Myrmarachne providens* (Peckham).**

Peckham, *Ant-like Spiders*, 1892.

One specimen was collected by me at Navankot (Lahore). This species is very similar to *M. laetus* but differs in the smaller size of the falces, which are more strongly rounded towards their exterior margin.

***Myrmarachne himalayensis*, sp. nov.**

(Plate xxxii, figs. 5a-c.)

Two ♂ specimens of this species were collected by Mr. Gravely at Ghumti in the Darjiling district, at a height of about 4000 ft. Unfortunately the abdomen is separated from the cephalothorax in both specimens; otherwise, the specimens are quite whole and all structures can be made out easily.

Measurements.

Total length 7 mm.

Cephalothorax: length 3.2 mm.; width 2 mm.; cephalic part 1.7 mm.

Falces 1.6 mm.

Legs 1432.

The cephalothorax is moderately high, the cephalic part being a little higher than the thoracic. The constriction between the cephalic and thoracic part is not so deep as in *M. tristis* or *M. laetus*, and it is only just indicated. The cephalic part is a little convex dorsally, almost flat, but rounded on the sides. The thoracic part begins a little lower than the cephalic and slopes gradually to its posterior margin which is fairly broad. The quadrangle of eyes is one-fourth wider than long and occupies about one-half



TEXT-FIG. 2.—Cephalothorax of *Myrmarachne himalayensis*, sp. nov., from the side.

of the cephalothorax. The anterior eyes are in a recurved row and are bent somewhat downwards. The middle eyes are situated about midway between the first and 3rd rows.

The falces (pl. xxxii, fig. 5*a*) are comparatively short and stout and are divergent. The unguis bears on its "marge inférieure" 5 minute teeth, but on its superior margin there are 7 larger teeth. The fang is bent almost at right angles just a little above its base, where it is also constricted. The lip is longer than wide and there is a constriction about its middle (pl. xxxii, fig. 5*c*). The relative position and shape of the lip, maxillary process of the palp and coxa are also shown in fig. 5*c*. In the palpus, both the tibia and tarsus are flattened and constitute the palpal organ. A ventral view of the right palpal organ is shown in pl. xxxii, fig. 5*b*.

The coxae of the 1st leg are separated by less than the width of the lip and are nearly approaching. The 1st femur is specially thick and the tibia of the 1st leg bears 2 rows of 6 long and strong spines on its underside. The 2nd tibia bears three shorter and thinner spines.

The sternum is long and narrow and is pointed both anteriorly and posteriorly. The pedicle is moderately long. The abdomen is long and oval with a constriction in the anterior third.

Colour.—The cephalothorax is dark brown, but black round the eyes. A number of white hairs arise about the anterior eyes and also from the clypeus. The falces are dark brown and rugose dorsally; ventrally the colour is lighter. The lip is darker in colour than the maxillary processes of the palps which are medium brown. The last two legs are darker than the 1st two, which are yellowish in colour. The 1st femur is dark brown. The sternum is medium brown.

The posterior two-thirds of the abdomen dorsally and laterally are shining and smooth and are of a testaceous colour; the anterior portion is of a dull greenish-brown tinge. In the mid-ventral line there is a broad yellowish band, while ventro-laterally there is a series of furrows and ridges running longitudinally.

Myrmarachne ramunni, sp. nov. (♂)

(Plate xxxii, figs. 4*a-c*.)

Some 13 ♂ specimens of this species were collected by Prof. Ramunni Menon at Madras and sent to the Indian Museum in two lots. They are referred to a new species on account of the peculiarities in the falces and the abdomen.

Measurements.

Total length 6 mm.

Cephalothorax: length 3 mm.; width 1.7 mm.

Falces 3 mm. long; 1 mm. wide.

Legs 4132.

The cephalic part is high and rounded on the sides. There is a constriction behind the dorsal eyes which cuts much more deeply into the sides of the cephalothorax than into the upper surface. The thoracic part is just a little lower than the cephalic; its highest part is in the anterior third, from which it slopes down in all directions, the slope being steeper on the sides than posteriorly. The posterior margin of the thorax is considerably narrower than the middle portion, where it is broadest. The quadrangle of eyes is more than a third wider than long and wider behind than in front. The first row of eyes is bent a little downward with the eyes close together; the 2nd row of eyes is about midway between the 1st and 3rd rows.

The most characteristic feature which distinguishes this species at once from others is the shape of the falces (*cf.* pl. xxxii, figs. 4*a*, 4*b*). They are long, stout structures with their proximal halves compressed from side to side, and elliptical in transverse section; while the distal halves are convexly flat dorsally and ridged ventrally and triangular in transverse section, the dorsal surface forming the base of the triangle. At the junction of the two halves, there is, so to speak, a regular twist through a right angle, the outer edge of the distal half being continued into the mid-dorsal ridge of the elliptical posterior half of the falx. Looked at from the side the falx is sinuous and possesses a short basal piece as in *M. laetus*. Ventrally there is a row of 9 small teeth on the outer edge and a row of 17 larger teeth on the inner edge of the falx. The fang is as long as the falx and has a curve at the base and a bend at the apex. The right palpus from below is shown in pl. xxxii, fig. 4*c*. The tibia of the 1st leg bears two rows of five spines each on its underside and the femur has one spine dorsally. The lip is longer than broad and the sternum is truncate anteriorly.

The abdomen also is characteristic. Out of 13 specimens almost all have got their abdomens flexed; in some it is only bent, while in others it is distinctly vertical, the posterior two-thirds bending on the anterior third. It is long and oval, but is not constricted. Dorsally it is convex and hard with chitin, while ventrally it is soft and flat.

Colour.—The cephalothorax is medium brown, the cephalic part with an olivaceous tinge dorsally. Both the cephalic and the thoracic parts are covered with short white hairs which also line the constriction behind the dorsal eyes specially towards the sides. The falces are dark brown in colour. The abdomen is brown and is covered with glistening yellowish-white hairs. There are white hairs on the sides at the anterior third. The posterior legs are darker in colour than the anterior. The metatarsus and tarsus in all the legs are darker than the other joints.

This species is closely allied to *M. manducator* (Westwood, *Mag. de Zool.* Anneé 1841, pl. i) from which it differs in the following points: the twist in the falx is characteristic of this species; the number of teeth on the "marge inférieure" is 17 and not 9

(5 anterior and 4 posterior) as shown by Westwood for *M. manducator*; the double curve of the fang is absent here and, lastly, the maxillary process of the palp has sharp bendings and is not rounded as in the other species.

***Myrmarachne uniseriatus*, sp. nov. (♂)**

(Plate xxxii, figs. 6a-b.)

This small spider belongs to a new species and was collected by Prof. Ramunni Menon at Madras.

Measurements.

Total length 4.2 mm.

Cephalothorax: length 2 mm.; width 1.1 mm.

Falces 0.8 mm.

Legs 4123.

The cephalothorax is moderately high; the cephalic part is limited behind by a shallow transverse depression and not by a sharp constriction as in most other species. Laterally there is a crescentic groove to separate the cephalic from the thoracic part. The anterior thoracic part is at about the same level as the cephalic, behind which the thorax slants posteriorly. As in most species the thoracic part narrows behind. The quadrangle of eyes is more than one-third wider than long and occupies two-fifths of the cephalothorax. The anterior eyes are close together in a recurved row, the middle being twice as large as the lateral. The 2nd row is nearer the first than the third row. The dorsal eyes are of the same size as the lateral.

The characteristic feature which distinguishes it readily from other species is that it has only one row of 10 teeth on the ventral side of the falces. These teeth are situated quite towards the inner margin and therefore belong to the "marge supérieure"; the teeth on the inferior margin are thus absent. The teeth present are larger towards the apex and smaller towards the base of the fang. It will be seen that in most of the species, as for example *M. laetus*, *M. himalayensis* and *M. ramunni*, the teeth on the inferior margin, or outer row, are smaller, both in number and size, than those of the superior margin. In the present species we have reached an extreme of this condition of the reduction of teeth on the "marge inférieure." Besides, the fang has an extra tooth on its under-side somewhere about the middle of its length (pl. xxxii, fig. 6a). The lip is longer than wide and there are 2 rows of 4 spines each on the under side of the 1st tibia, and 2 rows of 2 spines on the 2nd tibia. The abdomen is long and oval and there is only an indication of a constriction at the anterior third—nothing like what we find in other species.

Colour.—The cephalothorax is light brown in colour except round the eyes, where it is black. There are white hairs both on the cephalothorax and the clypeus. The falces are brown, but the

fangs are of a deeper colour. The legs are yellowish. Dorsally, the abdomen is covered with two chitinous pieces which bear some resemblance to the pieces of a carapace. The anterior piece occupies a little more than one-fourth of the abdomen and the posterior, which is larger, covers the rest of it. It is shining and olivaceous dorsally but white ventrally. It is sparsely covered with white hairs dorsally but thickly on its ventral side.

***Myrmarachne manducator*, Westwood. (♂)**

(Plate xxxii, fig. 7.)

Salticus manducator, Westwood, *Mag. de Zool.*, 1841, pl. i.

Salticus luridus, Simon, *Bull. Soc. Zool. France*, 1885, p. 453.

Ascalus manducator, Thorell, *Spiders of Burma*, 1895, p. 323.

There is one specimen of this species in the collection sent by Mr. Mackenzie from Siripur, Saran (Chapra) in Bihar. It has already been recorded from Singapore and Tharawaddy (Burma). Westwood gives its locality as "India septentrionali."

The only contribution I have made is a diagram of the ♂ palpus (pl. xxxii, fig. 7) which is not found in the literature cited.

***Myrmarachne paivae*, sp. nov. (♂)**

(Plate xxxii, fig. 8.)

This new species is described from a specimen collected by Mr. Paiva at Katihar in the Purnea district (Bihar). It is one of the largest ant-like spiders in the Indian Museum collection.

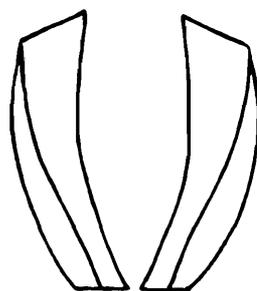
Measurements.

Total length 8·1 mm.

Cephalothorax : length 4 mm.; width 2 mm.; cephalic part 1·7 mm.; thoracic part 2·3 mm.

Legs 4132.

The cephalothorax is moderately high; the cephalic part is only a little higher than the thoracic. There is a constriction separating the cephalic from the thoracic part, which cuts much more deeply into the sides than dorsally. The thoracic part is distinctly longer than the cephalic and has a hump which slopes abruptly behind. The cephalic part is rounded dorsally and laterally and, being rather short, gives a rounded appearance as a whole. The quadrangle of eyes is one-fourth wider than long, wider behind than in front and occupies less than one-third of the cephalothorax. The anterior eyes are in a recurved row and the middle row is nearer the first than the third. The dorsal eyes are just a little larger than the lateral and are placed on the side of the cephalothorax.



TEXT-FIG. 3.—Falces of *Myrmarachne paivae*, sp. nov., from above.

The falces are characteristic. They are long and horizontal; they are not flattened on the upper surface but the inner face of each falx slants downwards and inwards from the upper edge so that the two only meet along the line of their lower edges, not along the whole surface of the inner faces, as is usually the case. It agrees in this feature with *Salticus imbellis* (Peckham, *Ant-like Spiders*, 1892). In the present species, however, the inner edge of the falces is also curved like the outer and the outer edge at the distal extremity passes into a ridge situated on the upper face of the falces behind (*cf.* *M. ramunni* above). There are 11 large teeth in the inner row and 9 smaller teeth in the outer row of teeth of the falx. The lip is longer than wide and the sternum is elongated and pointed anteriorly as well as posteriorly. The tibia of the 1st leg has 6 pairs of spines and the tibia of the 2nd leg has 3 pairs of spines on their under surfaces.

Colour.—The spider is of a dark olivaceous colour dorsally, the cephalic part is darker, almost black, while the thoracic has a brownish tinge, the abdomen being paler towards its anterior third. There are white hairs about the anterior eyes and the clypeus; on the latter, they arise from the sides and are bent in towards the middle line. The falces are reddish-brown and are also covered with white hairs. The legs are of the same colour as the cephalothorax, except the first which has a much lighter colour. The coxa and trochanter of the first and the trochanter of the fourth are pale white. Ventrally, the abdomen is of a yellowish colour with longitudinal blackish lines. The 1st femur is black-lined anteriorly and posteriorly; the metatarsus and tarsus of the 2nd and 3rd legs are yellowish-white.

This species is closely allied to *Salticus imbellis* from which it differs in size, shape of the cephalothorax, disposition and size of the eyes and the colouration.

***Myrmarachne satarensis*, sp. nov. (♂)**

(Plate xxxii, fig. 9.)

The description of this new species is based on a specimen collected by Mr. Gravely at Helvak, Koyna Valley in the Satara district (Bombay) at a height of about 2000 ft.

Measurements.

Total length 9 mm.

Cephalothorax: 3.5 mm. long; 1.6 mm. wide.

Pedicle 2.1 mm. long; 0.35 mm. wide.

Legs 4132.

The cephalothorax is moderately high; the thoracic part is dome-shaped and is as high as the cephalic, not lower, and is one-fifth longer than the cephalic. The cephalic part is separated from the thoracic by a constriction which cuts deeply into the sides. It is convex dorsally and is also rounded at the sides. The quadrangle

of eyes is two-fifths wider than long, wider behind than in front and occupies about two-sevenths of the cephalothorax. The first row of eyes is a little bent downward and is recurved. The 2nd row is nearer the first than the 3rd row. The dorsal eyes are of about the same size as the anterior lateral. The pedicle is very long indeed, more than 2 mm. in length, the longest I have seen so far in these spiders; it is biarticulate. The falces are short and stout and a little oblique. The sternum is long and narrow and the lip is longer than wide. The abdomen is long and oval and has a constriction in the anterior third. The structure of the epigynum is shown in pl. xxxii, fig. 9.

Colour.—The cephalic part is of a deep blue colour; in strong light it gives a metallic, burnished lustre. The thoracic part, the pedicle and the falces are medium brown. The palps are also of a shining blue colour. The abdomen is darkish, olivaceous or dull black behind the constriction; anteriorly it is greyish-white. There are white hairs on the clypeus and also in the constriction between the cephalic and the thoracic parts. There are two white oblique bands, one on each side of the abdomen, running behind and from the abdominal constriction; they meet dorsally on the constriction. The last two legs are dark brown, but the 1st two are pale white in colour. The patella and tibia of the 1st leg and the trochanter, femur, patella and tibia of the 2nd leg are black-lined anteriorly. The tibia of the 1st leg bears 2 rows of 4 spines and that of the 2nd leg bears 2 rows of 3 spines on its under surface.

This species is allied to *M. praelonga* (= *Synemosyna praelonga*), Thorell (*Ann. Mus. Genova*, XXX, p. 64, 1890) from which it is easily distinguished by the depression and convexity of the cephalic part, the great length of the pedicle and also by the colour.

LIST OF LITERATURE.

1. Simon, E. *Histoire Naturelle des Araignées*, vol. II, Paris, 1897, pp. 496—505 and 866—867.
2. Peckham, G. W. and E. G. Ant-like spiders of the family Attidae, *Occasional Papers of the Nat. Hist. Soc. Wisconsin*, vol. II, No. 1, 1892.
3. Peckham, G. W. and E. G. Spiders of the *Homalattus* Group of the Family Attidae, *Occasional Papers of the Nat. Hist. Soc. Wisconsin*, vol. II, No. 3, 1895, pp. 171—172.
4. Simon, E. *Bull. Soc. Zool. de France*, X, 1885, pp. 440—441.
5. Thorell, T. *Abhandl. Senckenb. Naturf. Gesellsch.*, 1906.

6. Thorell, T *Spiders of Burma*, 1895, pp. 320—329.
 7. Cambridge, O. P. *Ann. Mag. Nat. Hist.* (4) III, 1869, pp. 68—69.
 8. Westwood, J. O. *Magazin de Zoologie*, 1841, pl. i.
 9. Strand, E. *Zool. Anz.*, XXXI, 1907, pp. 568—569.
-