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XIV.—NEW ENGLAND SPIDERS OF THE FAMILY ATTIDAE. BY J. H. EMERTON.

The Attidae are distinguished by a peculiar arrangement of the eyes. The front of the head is wide and square and the front row of eyes directed forward and nearly straight or with the lateral pair a little the highest. The front middle pair are larger than the others and often much larger, so that at first sight the spider appears to have but two eyes. Behind the lateral eyes of the front row are two very small eyes and still farther back, often near the middle of the cephalothorax, are two others a little larger, sometimes as large as the front lateral pair. See figures on Plates XVII and XVIII.

The relative length of the legs is very variable. The fourth pair is usually the longest, but often the first, and even in some species the third pair. The legs of the first pair are usually thickened, and often those of the second pair. Most species can jump a considerable distance and this seems to be done from all the legs at once and does not depend on their relative length or size. The feet have two claws, generally long and with many small teeth, and, under the claws, a bunch of long hairs. The colors of the Attidae are generally bright and of great variety. They are partly caused by colored scales and hairs which in some species cover the whole body and in others are so small that the color of the skin shows between them. The scales are usually long and narrow like flattened or branched hairs, Pl. XVI, figs. 1j, 1k, others, especially those forming the white spots, are short and flat, fig. 5d. Some of the scales of many species have a metallic luster and their color changes with the direction of the light. As spiders become older part of their scales rub off and so change their color. In alcohol great changes in color take place. The wetting of the scales makes them transparent and the colors of the skin show through them. For this reason the front of the head and around the eyes is black or dark colored in most species in alcohol while the same parts in life are covered with white or light colored scales. Pl. XVII, figs. 2, 2a. Some species that are yellow or brown when alive turn red in alcohol as *Dendryphantes militaris* and *aestivalis*.

The northern Attidae, like the Drassidae, are generally of middle size, none of them being as large as the larger Lycosidae and Epeiridae,

or as small as a large part of the Therididae. Some species live on the ground and under stones and leaves but most of them on plants and in open places. They make no webs except nests in which they hide in winter, or when moulting or laying eggs. The pairing of some species takes place in the nest, and the males of several of them enter the nest of a young female and wait for her to mature. The habits of the Attidae, especially the fighting and mating habits of many species, have been described by G. W. and E. G. Peckham, in the papers of the Wisconsin Nat. Hist. Society of 1889 and 1890.

The palpi of the males are less variable than in most families. They are usually stout and short with a short tibial hook and short tube to the palpal organ, the end of the tube resting in a groove in the end of the tarsus. The end of the tarsus is obliquely flattened and covered closely with short fine hairs.

A large number of the American Attidae have been described. Hentz described some forty species under fifty-one names. Many of these are comparatively easy to identify but as with other families probably a quarter of them will always remain uncertain.

The species described by Walckenaer and Koch are even more uncertain than those of Hentz. A considerable number of them are very probably the same as species described here and in the papers of Mr. Peckham, but the descriptions and figures are in most cases too indefinite to be identified.

The spiders described by Keyserling, in 1885, are, most of them, in the Museum of Comparative Zoology, at Cambridge, Mass., and I have examined and identified most of them. More species have lately been described by G. W. Peckham and Mrs. Peckham, who have made a specialty of this family, in the Transactions of the Wisconsin Academy of Sciences for 1888. I have compared specimens of these species with my own. I have also had for comparison a number of European Attidae named for me by Mr. Simon. The classification of the American Attidae needs a more thorough revision than can be undertaken in a paper dealing with so small a number of species as the present and it will no doubt soon be done by Mr. Peckham. The classification of Simon as modified by Peckham has been followed as far as possible.

The species are included in the following genera :

Phidippus Koch. Large hairy spiders. Mandibles large and strong and longer than the front of the head. Cephalothorax widened across the middle. Anterior row of eyes comparatively small and a little separated from one another, the lateral higher than

the front pair. Middle eyes nearer the lateral than the dorsal. Legs short and stout 4, 1, 2, 3 in females and 1, 4, 2, 3 in males. Males with longer legs and deeper colors than females. Male palpi with a short tibial hook and short tube of the palpal organ. *P. rufus, ruber, brunneus, mystaceus, tripunctatus*, page 224 to 228.

Dendryphantes Koch. Hairy spiders of moderate size. Front row of eyes large and short distances apart, the lateral only a little higher than the front pair. Middle eyes half way between the lateral and dorsal or a little nearer the lateral. Mandibles large and strong, those of the males spreading a little apart and having a sharp edge on the outer side. Legs 4, 1, 2, 3 in females and 1, 4, 2, 3 in males. Colors of the sexes very different. Females brown and gray, indistinctly marked. Males darker brown with bright white markings, color of skin changing to red in alcohol. *D. militaris, montanus, aestivalis*, page 228 to 230.

Icius Simon. I use this genus as it has been used by Keyserling and Peckham to include several species that must soon be separated into two or three genera. *I. mitratus* and *palmarum* resemble *Dendryphantes*, but have the cephalothorax more flattened, the abdomen narrower and longer, and the front legs of the males more elongated. The other species approach *Epiblemum* and *Menemerus*. They have the cephalothorax elongated, the colors dark and the hairs and scales very small and partly iridescent. The legs are marked with longitudinal lines and the front pair much elongated. *I. palmarum, mitratus, elegans, hartii, formicarius*, page 232 to 236.

Marptusa Thorell = *Marpissa* Simon. Cephalothorax and abdomen much flattened and both widest across the middle. Cephalothorax very low in front, the front eyes touching its lower edge. Lateral eyes half their diameter from the front pair. Mandibles small. Legs 4, 1, 2, 3, in females and 1, 4, 2, 3, in males. *M. familiaris*, p. 237.

Epiblemum Hentz = *Calliethera* Koch and Simon. Cephalothorax more than half longer than wide, a little widened in the middle and depressed in the middle between the cephalic and thoracic parts. Abdomen oval, not much longer than the cephalothorax. Legs 4, 1, 2, 3, in females and 1, 4, 2, 3, in males. Mandibles of the males elongated and turned forward. Distinct white markings on cephalothorax and abdomen. *E. scenicum*, page 238.

Menemerus Simon. Cephalothorax half longer than wide, widest a little behind the middle, flattened above, and with a deep groove across the middle. Legs 4, 1, 2, 3, or 1, 4, 2, 3, front legs thickened. Colors in longitudinal stripes. *M. binus, lineatus*, page 239.

Maevia Koch. Cephalothorax high and wide, but little widened in the middle. Mandibles small. Legs long, slender and tapering, differing little in length, 4, 1, 2, 3. Hairs and scales short and colors bright. *M. vittata*, page 236.

Zygoballus Peckham. Cephalothorax high. Eye space nearly as long as wide and widest behind. Dorsal eyes very high and wide apart. Mandibles large in both sexes, those of males with spines on the inner and under sides. Legs 4, 1, 2, 3 and 1, 4, 2, 3. *Z. bettini, terrestris*, page 230, 231.

Phlegra Simon. Cephalothorax long with the cephalic part short, about half as long as the thoracic. Lateral eyes higher than the front pair. First and second legs short and thickened. Legs 4, 3, 1, 2 or 4, 1, 3, 2. Markings in longitudinal lines. *P. leopardus*, page 242.

Hasarius Simon. Cephalothorax a third longer than wide, widest in the middle and flat above. Abdomen larger than cephalothorax, widest across the middle, and pointed behind. Dorsal eyes as far apart as lateral. Legs of third and fourth pairs of equal length. First or fourth pair longest. The cephalothorax has usually a band of light color across the middle behind the eyes. *H. hoyi*, page 243.

Habrocestum Simon. Cephalothorax high, longer than in *Attus* and the dorsal eyes farther back. Colors black and white in females and bright and iridescent in males. Third legs longest. *H. splendens, peregrinum*, page 244, 245.

Attus Walck., Simon. Cephalothorax nearly as wide as long, widest in the middle. Eye space two-thirds as long as wide. Dorsal eyes as far apart as the lateral. Third legs shortest. Fourth legs longest in females and usually in males. *A. palustris, sylvestris*, page 247.

Saitis Simon. Small spiders with the cephalothorax long and widest behind. Dorsal eyes nearer together than the front lateral. Abdomen short and wider than the cephalothorax. Third legs as long as fourth and longer than first. *S. pulex*, page 246.

Euophrys Koch, Simon. Cephalothorax low and wide in front, long and with the sides almost parallel. Legs 4, 1, 2, 3, first and second pairs thickened. Hairs short and skin in the females marked with gray and brown spots like *Tegenaria*. Males darker colored. Some species with long hairs and scales and markings like *Attus*. *E. monadnock*, page 241.

Neon Simon. Small spiders with large eyes; the dorsal pair as large as the lateral and nearer the back than the front of the cepha-

lothorax. Hairs short and skin marked with gray spots. *N. nellii*, page 240.

The three following genera are ant-like in general appearance. They are long and narrow. The pedicel of the abdomen is long and visible from above. Abdomen and cephalothorax each with a depression near the middle; legs slender.

Synageles Simon. Dorsal eyes as far back as the middle of the cephalothorax. Transverse depression very slight. Cephalothorax flattened above, the hinder half narrowing slightly backward. *S. picata*, page 250.

Salticus Latreille, Simon. Cephalic part of cephalothorax higher than the thoracic. Mandibles large. Palpi of females with tibia and tarsus thickened. *S. ephippiatus*, page 249.

Synemosyna Hentz. Very long and narrow. Depressions in cephalothorax and abdomen deep. Cephalothorax and abdomen both narrowed toward the pedicel. Middle eyes very large; the others all small. *S. formica*, page 248.

Phidippus multiformis, new sp.

Phidippus rufus Peckham, but not *Attus rufus* Hentz, nor *A. castaneus* Hentz, nor *Phidippus ruber* (Keyserling) Peckham. Keyserling has named this species *Phidippus auctus* Koch in the Cambridge museum.

The female is 8 to 9 mm long, the male 5 to 7 mm. The general color of the adult female is yellowish brown with black and white markings. Around the front of the abdomen is a white band, and on the back are two indistinct longitudinal black stripes in which are four pairs of white spots. The general brown color is produced by a mixture of scales and hairs of various colors. The females are most brightly colored just before reaching maturity. The general color is then a bright orange, mixed with darker red and brown scales and black hairs. The cephalothorax is covered with yellow scales inclining to red in the middle of the back. The black stripes on the abdomen are more distinct and the white spots larger. Pl. XVI, fig. 1b. The legs are pale in the middle of the joints and dark toward the ends and covered with gray and black hairs. The palpi are yellow. The hairs and scales are of various shapes, the most common being that of slightly flattened hairs, fig. 1j. These, with black hairs, form the darker colors. The yellow and orange scales are wider and less sharply pointed, fig. 1k, and the white spots have short and wide scales. Under the abdomen the color is light gray with two parallel darker stripes. In younger spiders the black

markings of the abdomen are larger and the white markings of the hinder half larger and wider. The yellow parts are paler and the joints of the legs are less darkened toward the ends. In very young, just after leaving the cocoon, fig. 1d, the legs are entirely pale, except the claws, which are black; the cephalothorax is black with a few yellow scales. The abdomen, which is very short, is black with a yellow marking along the middle and around the front half. The two hinder pairs of white spots are twice as wide as long, and the other pair are very small.

In alcohol the orange color disappears almost entirely. The palpi remain light yellow and the colors of the legs become lighter and darker shades of yellowish brown. The cephalothorax is dark brown, darker on the head, and the abdomen becomes brown with the black and white markings still distinct but faded.

The colors of the male are entirely different from those of the female, fig. 1a. The cephalothorax and legs to the end of the tibia are black. The metatarsus and tarsus of all the legs are reddish brown with black ends. The palpi are black with a stripe of white scales on the upper side of patella, tibia and half of the tarsus. Abdomen black beneath and in the middle above. Around the front end is a white stripe. The sides of the top of the abdomen are bright orange and between the orange and black areas are three pairs of white spots. In the middle of the black area is a lighter stripe of yellowish iridescent scales which, in some lights, can not be easily seen, and may be absent altogether.

The epigynum has a round opening in front with the sides slightly darkened and toothed. The hinder notch is rounded but variable in shape. Pl. I, fig. 1e, 1f.

The male palpus has the tibial hook, small and sharp. Fig. 1h, 1i.

This is one of the most common Attidae on plants throughout the summer. It matures in July and the males and females may be found together in a bag of silk among leaves, and in the same bag the female makes her cocoon of eggs, from which the young come out in August and become half grown before winter.

Mt. Washington and Dublin, N. H., Eastern Massachusetts, New Haven, Conn,

Phidippus brunneus, new sp.

This spider closely resembles *P. multiformis*, and I supposed it to be a variety of that species. The size is the same and it has indistinctly the same markings on the abdomen in some individuals. The differ-

ences are in the color and the epigynum. The color in life is reddish brown, covered with gray and black hairs and small gray scales not close enough to cover the skin. The cephalothorax is a little darker brown than the abdomen. The abdominal markings are indistinct in some individuals, and in most entirely absent. The legs are more uniformly colored than in *P. rufus*, the ends of the joints being less distinctly darkened. The epigynum, Pl. I, fig. 2, is more distinct than in *multiformis*, the dark thickened edges of the anterior opening are longer and the opening is divided in front by a thick brown middle line into two.

Salem and Waltham, Mass.

Phidippus ruber Keys, not *P. rufus* Peckham.

This species is known to me principally by the males. These are 6 or 7 mm long. The cephalothorax and abdomen are bright orange above and black beneath. The abdomen is covered with large orange scales lighter colored than those of the cephalothorax and mixed with the scales are long black hairs. On the hinder half of the abdomen are two distinct black longitudinal stripes in which are two pairs of white spots. Pl. XV, fig. 4. These markings vary in size and in one male are almost covered by orange scales. The femora of all the legs and tibia of first pair are black, the other joints orange brown, darker or black toward the tips. The male palpi have the tibial hook flat and round at the end. Fig. 4b, 4c.

The female which I suppose to belong to this species is 9 mm long. The abdomen is covered with orange yellow scales and black hairs finer and shorter than in the male. There are no black stripes. Around the front of the abdomen is a white stripe. The cephalothorax is brown covered with orange scales. The legs are orange brown, the front pair darkest and the femora of all the legs darker than the other joints, all of which are slightly darker toward the tip. The mandibles are brown in both sexes and not iridescent. The sternum of the female is dark, almost black, but the abdomen is as light beneath as it is above. The epigynum has two small openings. Fig. 4a.

Female from Providence, R. I. Males, Topsfield, Mass., Sherborn, Mass., and House Island near Manchester, Mass.

Phidippus mystaceus.

Attus mystaceus Hentz, ♀ *Phidippus albomaculatus* Keys., ♂ *P. purpuratus* Keys., *P. galathea* Peckham.

The largest of the New England Attidae, females measuring 12 to 15 mm long. The female is black, covered with gray hairs and scales closely enough to give the whole spider a gray color. On the abdomen are two longitudinal black stripes that do not extend quite to the front end and in these stripes are four pairs of bright white spots. The front end of the abdomen is crossed by a white band that extends back obliquely each side and at the sides of the abdomen are several oblique white stripes with black edges. Pl. XVI, fig. 3. The hairs of the palpi and front of the head under the eyes are longer and whiter than on other parts of the body. Under the abdomen is a middle dark line narrowing behind, on each side of which is a light gray border. At the sides of this are two wider dark bands and outside of them lighter gray. Legs gray, not ringed but a little darker toward the ends of the joints.

In alcohol the general color becomes dark brown and later reddish and all the markings are less distinct.

The male resembles the female but is darker colored. The cephalothorax, palpi and legs are black with a few scattered white scales and hairs. Abdomen black beneath. Back of abdomen with a greenish white border and a black area in the middle in which are four pairs of white spots.

The male palpus is large. The tarsal hook is nearly as long as the tarsus and sharp and slightly curved at the tip. Fig. 3a, 3b.

The epigynum has a hard plate with two small openings in front and a notch of various shapes behind. Fig. 3c, 3d.

It lives under stones at all seasons. In winter or when moulting or laying eggs it hides in a thick white bag of silk, in which the cocoons are made early in the summer. The young become nearly full grown before winter. Adult males are found from May to July and adult females at all seasons.

Common all over New England. Peckham has not found it in Wisconsin.

Phidippus tripunctatus.

Attus audax Hentz, *Attus tripunctatus* Hentz, *Phidippus morsitans* Peckham.

A large female from Connecticut, measures 10 mm long and they are usually 8 to 9 mm. Peckham says western specimens are larger, often as long as 15 mm.

The color of both sexes is black, with black mixed with a few white hairs. The legs are gray in the middle of the joints and black toward the tips. The abdomen has a white band around the front and is marked with three large white spots, the middle one corresponding to the second pair in *multiformis* and *mystaceus* and the other two to the third pair. The other spots are generally present in this species but so small as not to be readily noticed. The under side of the body is black with two indistinct light stripes under the abdomen. The mandibles are metallic green and blue.

The males are 6 or 7 mm long and colored like the female. The mandibles have a short blunt tooth in front over the claw. Fig. 5a.

The male palpi have the tarsal hook pointed and turned downward. Fig. 5c. The palpal organ is wider at the base than in most species. Fig. 5b.

It lives under bark and stones, hibernating half grown in thick silk nests and concealing its egg cocoons in the same places. It is common all over the United States.

Dendryphantes aestivalis Peckham, 1883.

D. capitatus Peckham, 1885. Resembles *Attus capitatus* and *parvus* Hentz.

Females 5 or 6 mm long and males smaller. There are two varieties in the colors of the females. The light variety, Pl. XVII, fig. 2, has the light parts white or light yellow and the dark parts dark brown covered with white hairs and scales. The cephalothorax is dark brown thinly covered with scales so that the dark color shows between them in spots. The legs are light yellow and translucent, indistinctly ringed with brown at the base, and near the tip of each joint all covered with greenish white hairs. The palpi are light and without rings except on the femur and patella. Abdomen brighter yellow than the thorax with four pairs of purplish brown spots, the second pair largest, connected with a paler brown middle marking. Abdomen beneath with a purple brown stripe in the middle and oblique brown stripes at the sides. Sternum, maxillae and mandibles light brown. Scales smaller than those of the dark variety.

The dark variety, fig. 2b, is generally smaller and covered with longer hairs and scales. The legs and palpi are more distinctly ringed with dark brown. The dark spots on the abdomen are smaller and more connected by dark lines than in the other variety. The under side is dark brown.

In alcohol they become in a few days bright red in the darker parts which afterward fade and remain dull red for a long time. Both varieties in alcohol look much alike.

One of the most common Attidae, living on plants, especially evergreen trees, all over New England.

The colors of the male, Fig. 2c, differ extremely from those of the female. The legs are ringed as in the female, but the brown parts are wider and not obscured by white hairs, while the white parts are whiter. The cephalothorax is dark brown with a white stripe each side under the eyes, bending toward each other behind but not connected. The front of the head is also white and covered with long white hairs. The palpi have the femur dark brown at the base and white at the end. The patella and tibia are brown and the tarsus is brown with white hairs on the upper side. The abdomen is white in front and around the sides. The middle is dark brown with a few yellow and greenish scales in the middle. The brown area is usually notched at the sides in four scallops and sometimes indistinctly divided in four pairs of spots as in the female.

In the female the cephalothorax is a third longer than wide and not much widened across the middle. In the male the cephalothorax is only slightly wider. The mandibles are vertical in both sexes and but little larger in the male than in the female.

The male palpi and the palpal organs are large in proportion to the size of the spider. The palpal organ extends back beyond the tibia. The tibial hook is very small. Fig. 2e. The tube of the palpal organ has a stiff point at its side a little longer than the tube itself. Fig. 2d.

The epigynum has the front opening small and divided into two directed sidewise. Fig. 2f.

Dendryphantes montanus, new sp.

Female 7 mm long, a little smaller than *militaris*, cephalothorax as long as in *militaris* but not as wide. Legs and mouth parts a little more slender than in *militaris*. The markings, as far as can be judged from specimens in alcohol, are like those of *militaris*.

The male has the cephalothorax nearly as wide as long. Pl. XVII, fig. 3a. The mandibles are as long as in *militaris* but not as stout, fig. 3b, and the palpi are as long and much stouter. The femora of the palpi are thickened towards the end, as in *aestivalis*, and the tibia and patella are very short. The palpal organ is long, and the tube long and stout. Figs. 3d, 3e. The epigynum, fig. 3c, has a single round opening, and a notch of various shapes, like *aestivalis*.

Mt. Washington, N. H.

***Dendryphantes militaris*.**

Attus militaris Hentz. *Philaeus militaris* Peckham.

Female 1 or 8 mm long. The cephalothorax is wide across the middle in both sexes, nearly as wide as long. The middle eyes are a little nearer the front lateral than the dorsal eyes. The mandibles are a little flattened in front, and in the male, the front outer corner over the claw is sharp. Pl. XVII, fig. 1a.

The general color is brown, covered with black, and a few gray hairs, darker and browner than *aestivalis*. In alcohol it turns red but not so bright as *aestivalis*. The cephalothorax is brown in the female, and in the male the same color, with a white stripe each side under the eyes. Fig. 1a. The abdomen of the female is brown, with four pairs of white, oblique marks in the middle, and four at the sides. Fig. 1. The front of the abdomen is white. In the male the middle white spots are absent, and the lateral and front white marks are united into a band that extends nearly around the abdomen. Fig. 1a.

The palpi of both sexes are very slender, and the tarsi and palpal organs of the male are unusually small for so large a spider. The tube of the palpal organs is longer than in *aestivalis* and more simple. Fig. 1d.

The mandibles of the male are widened at the end, and have a large two-pointed tooth near the end of the claw. The claw has a short, flat tooth on the inner side, near the middle. Fig. 1b, 1c. The epigynum is like that of *aestivalis*, but the opening is wider.

Zygoballus bettini Peckham.

A larger and more slender species than *terrestris*. The body is higher and narrower, the legs and palpi are larger, and the complicated mandibles of the male are larger in proportion to their thickness. The cephalothorax is almost as high in the middle as it is wide, and slopes from the hinder eyes steeply backward. Toward the front the slope is less, and the front of the head is half as high as the hind pair of eyes. Pl. XVII, fig. 4. The abdomen is rounded above and widest across the hinder half.

In life, the colors are bronze green and yellow, marked with white. In alcohol the cephalothorax is dark brown with whitish scales. The abdomen is lighter brown, sometimes reddish, especially in specimens not long preserved, with white markings sometimes forming a regular herring-bone figure in the middle, and sometimes broken

into irregular dark and light spots. Around the front is a white band, and there are other slanting white stripes along the sides.

The femur of the first pair of legs is very dark brown, the other joints white. The second and third legs are white, or only slightly darker at the ends of the joints. The fourth legs have the hinder half of the coxae, and the ends of all the joints brown.

In the male the legs and palpi are brown, without the distinct dark markings of the female. The abdomen is brown with iridescent greenish scales, and a bright, white band around the front, and two white oblique stripes each side.

The male has the front legs much larger than the female. His mandibles are long and stout at the base, and spread apart at the ends. In the middle of the inner side is a large tooth, directed downward, and near its base, two smaller ones, on the under side of the mandible. On the under side, near the outer edge, is a long ridge, ending in a tooth, curved inward. Fig. 4a. The male palpi are very slender, and the tarsus and palpal organ long and small. The patella and tibia are each twice as long as thick. The tibial hook is nearly as long as the tibia. Fig. 4b.

Common on plants in summer, and occasionally found under stones and bark.

Massachusetts and Connecticut.

Zygoballus terrestris, new sp.

Length of female 3 mm. The cephalothorax is two-thirds as wide as long, and half as high as long. The posterior eyes are the full width of the cephalothorax apart, and the thorax slopes backward from them, but not as steeply as in *bettini*, nor is it as much narrowed behind. Pl. XVII, fig. 5.

The color of the cephalothorax in alcohol, is dark brown, covered thinly with small, light colored scales. The first pair of legs are dark brown, the femur darkest, and the other joints a little lighter in the middle. The other legs are lighter with the ends of the joints dark. Fig. 5c. The abdomen is lighter than the thorax, and marked with irregular and variable dark spots.

In the male the abdomen is brown in the middle, with a distinct white line around the front and sides. The male palpi are short, the patella and tibia being not much longer than wide. The tibial hook is as long as the tibia itself, and only slightly curved. Fig. 5d. The palpal organ is small and covered by the tarsus. The tube is moderately long, and lies in the groove at the end of the tarsus for

its whole length. The mandibles are similar to those of *bettini*, but smaller. The epigynum has the anterior opening nearly square, opening toward the front, and the posterior notch very wide. Fig. 5b.

On fences and under leaves in winter.

Boston and Cambridge, Mass., and New Haven, Conn.

Icius mitratus Peckham.

Attus mitratus Hentz.

This species resembles closely *palmarum*, differing mainly in color. The legs are all white in both sexes, and the mandibles of the male are not long and horizontal as in *palmarum*. The male palpi and palpal organs are like those of *palmarum*, with the tibial hook perhaps a little more slender. The female preserved in alcohol is still more like *palmarum*. The epigynum is of the same shape and the markings in four large spots on the abdomen, like those of some females of *palmarum*. The cephalothorax seems to be a little wider, and the colors of the hairs of the whole body whiter than in *palmarum*.

A living male has the legs white, or a little greenish, with long white hairs, those on the front legs longer than the diameter of the leg. On the front of the leg and palpi are long, white hairs. The sides of the cephalothorax and abdomen, and the under side of the abdomen are white. The middle of the cephalothorax and abdomen are light brown, covered with light, yellow hairs, through which three or four dark spots show indistinctly. Pl. XVIII, fig. 2.

Brookline and Malden, Mass., and New Haven, Conn.

Icius palmarum Peckham.

Epiblemum palmarum Hentz.

Female 5 mm and male 4 mm long. The living female has the legs and palpi transparent white, and the claws black. The few spines on the legs are black. The whole body is covered with light gray or white scales, mixed with short, fine black hairs. The abdomen has a row of indistinct, darker triangular spots in the middle and oblique rows of small spots at the sides. Pl. XVII, fig. 1. In alcohol the legs become dull yellow, and the rest of the body turns red as in *aestivalis*, afterwards fading to a dirty yellow. The markings of the abdomen become more distinct, and in some individuals form four large, dark brown spots. Fig. 1f.

The living males, fig. 1g, have the front legs very dark brown, except the tarsi, which are a little lighter. The other legs are transparent white, cephalothorax and abdomen dark and reddish brown, mixed with shining, greenish white scales, and sometimes a little copper red around the eyes. There is a white stripe the whole length of the body, each side, and across the front of the head below the eyes. The maxillae and mandibles are dark brown, and the palpi are the same color, except the tarsi which are light yellow; sternum and under side of abdomen dark brown. Some males show indistinctly dorsal markings of the abdomen, like the female.

The female resembles *aestivalis*, but is longer in proportion to its width and has the front legs stouter. The abdomen is usually nearly twice as long as wide. Fig. 1. The cephalothorax is flattened above from the front eyes two-thirds its length backward, in both sexes, fig. 1a, while in *aestivalis* it is slightly arched upward.

In the males, the front legs are, as usual, longer and stouter than the others and are made very conspicuous by their dark color. The mandibles of the male are larger than those of the female, and more or less turned forward, according to their length. In some males the mandibles are only a little longer than those of the female, and in these the patella and tibia of the front legs are not much longer than the femur. Others, usually larger spiders, have the mandibles nearly as long as the cephalothorax and extending forward horizontally, the maxillae are longer, and the first pair of legs have the patella and tibia one and a half times as long as the femur. Fig. 1e. Fig. 1g shows the mandibles of the common length.

The epigynum has two small anterior openings and a large, wide notch behind, half-way between the anterior openings and the transverse fold.

The male palpus has the tibia as wide as long, and the patella a little longer. The tibial hook is as long at the joint itself, thin and curved inward a little at the end. The tube of the palpal organ is long and curved around the end of the bulb, the point resting in a groove turned obliquely outward on the end of the tarsus. Figs. 1h, 1i.

On plants in summer. Massachusetts and Connecticut.

Icius elegans, ♀ *Attus elegans* Hentz. ♂ *Attus superciliosus* Hentz.

Dendryphantes elegans Peckham.

Female 6 mm long. Cephalothorax two-thirds as wide as long, and abdomen half as wide as long. The sides of the cephalothorax are

nearly straight and parallel in the female, and widened a little behind the middle in the male.

The colors of the living female, Pl. XVIII, fig. 3, are bronze green which in some lights changes to copper red on the abdomen and cephalothorax. The legs are yellow, with longitudinal dark stripes, except the front femora, which are dark brown. The palpi are bright yellow at the end and dark at the base. In alcohol the colors appear dull and darker.

The males, fig. 3d, are much more brightly colored. The legs are orange, darker toward the ends, with fine dark, longitudinal stripes. The ends of the front tibiae are dark brown, and have long, brown hairs on the inner and under side. The palpi are orange, darker toward the end. The sides and hinder part of the cephalothorax are orange, and there is a white line each side over the coxae. The upper part of the cephalothorax and abdomen are covered with greenish yellow scales. On the front of the head are tufts of long hairs, yellow, mixed with black, pointing forward and a little inward between the middle and lateral eyes, fig. 3e. On the hinder end of the abdomen is an iridescent purple spot. The abdomen is green on the under side, and the sternum and coxae are orange. In alcohol the colors become dull yellow and brown.

The mandibles of this species are slender, and the claw short, and strongly curved inward toward the point. In the male the mandibles are a little longer, and have a slight notch on the inner side, one-third their length from the end. Fig. 3c.

The epigynum is wide, with two anterior openings more than their diameter apart, and the posterior notch is divided into two. Fig. 3b.

The male palpi have the patella as wide as long, and the tibia still shorter, with a very short and small hook on the outer side. Fig. 3g. The tube of the palpal organ is twisted at the end, and has a spherical base, partly covered by the softer part of the bulb. Fig. 3f. The male has the legs of the first pair much larger than the others, and all the legs longer than the female. In the female the fourth legs are longest.

Some males have the colors darker and the front legs less elongated than usual, and do not have the black spot and black tuft of longer hairs on the ends of the tibiae. They also have the tufts of hair over the eyes much smaller. Figs. 4, 4a. The palpal organs are a little stouter. Figs. 4b, 4c. Specimens from the Adirondacks and White Mountains are of this variety.

White Mountains, N. H., to New Haven, Conn,

Icius hartii, new sp.

The name *Icius Hartii* was given this species by Mr. Peckham, but not published. A specimen in the Museum of Comparative Zoology in Cambridge, is named by Keyserling *Icius tibialis* Koch.

Of this species I have only one female from Medford, Mass. This is 7 mm long, cephalothorax 2 mm long, and 1 mm wide. The cephalothorax is straight at the sides, very little narrowed behind. The abdomen is oval, a little pointed behind. Pl. XVIII, fig. 5. The length of the legs is 4, 1, 2, 3. The front legs are thickest, and the tibia is more than twice as thick as that of the other legs. In the male, fig. 5a, the front legs are longest and still more thickened than in the female. The cephalothorax is dark brown, with gray hairs. The abdomen has the middle dark and the border white; the middle area broken at the edges by three or four pairs of white spots. The under side of the abdomen is light in the middle and black around the edges up to the white border of the upper surface. The femora are dark, except the third pair, which has light stripes. The other joints are dark at the ends, and have dark longitudinal stripes. The epigynum is small, and has two small openings directed forward about their diameter apart. Fig. 5d.

Some of the Wisconsin specimens which I have from Mr. Peckham, are a little larger, and the dorsal markings are more broken by oblique rows of white spots. The males have the abdomen shorter and the front legs much longer and thicker. The mandibles are a little longer than in the females. The male palpi are short and stout, the patella and tibia are as short as wide, and the tibial hook is very small and pointed, and directed downward. Fig. 5c.

The palpal organ is long enough to nearly cover the tibia. The tube is short and stout, and a little swelled at the base. Fig. 5h.

Icius formicarius, n. sp.

Length 5 mm. Cephalothorax and abdomen usually about the same length. The general appearance is ant-like. The color is black with dark bronze green scales, except a white line each side of the thorax, and white stripes on the legs, two above and one beneath. One specimen has a few white scales on the spinnerets.

The cephalothorax is two-thirds as wide as long and the sides are nearly straight and parallel. The abdomen is widest across the hinder half and a little pointed behind. Both cephalothorax and abdomen are less flattened than in the other species. The legs are

long and slender, the fourth pair longest and the first next. The first pair are only a little stouter than the others. Pl. XVII, fig. 6. The epigynum is large with the anterior openings wide and far apart. The notch behind is very deep and narrow. Fig. 6b.

I have seen females only from Salem and Medford, Mass., and New Haven, Conn.

Maevia vittata.

Astia vittata Peckham, *Attus vittatus* Hentz, *Attus niger* Hentz. ♂ *Maevia pencillata* Koch.

This is a large and brightly colored spider with long legs. The female is 8 mm long, the male smaller but with the legs longer. Pl. XIX, figs. 1, 1a, 1b.

The living female has the legs and palpi translucent, a little yellow or greenish white. They are marked with indistinct light gray rings and black spots at the base of the hairs and spines. The cephalothorax is dark brown between the eyes and translucent like the legs in the thoracic part. There is a fine black line in the middle and on each side and a few gray marks radiating from the dorsal groove. The whole top of the cephalothorax is covered with greenish yellow scales mixed with gray hairs. The eyes are black and one female has a red stripe under the eyes each side. The abdomen is covered with scales which in the middle and at the sides are gray and mixed with black hairs. There are two longitudinal bands of light copper red along the back of the abdomen and indistinct angular marks of the same color in the middle of the hinder half. The colors of the under side are light gray and yellow spotted with gray on the abdomen.

According to Peckham, males of two very different colors belong to this species. One kind resembles the female. Fig. 1b. The red bands on the abdomen are broken up into rows of spots connected with the middle angular markings. The gray and black spots on the legs and cephalothorax are larger and there are several black marks on the front of the abdomen.

The palpi are bright orange yellow with the tibial hook black and a black spot on the inner side of each joint. The size of the black spot varies in different individuals and so passes into the other variety in which the cephalothorax and abdomen are entirely black and the palpi black except a few orange hairs on the outer side. The black cephalothorax and abdomen are covered with dark greenish shiny scales. The legs in this variety are white except the hairs. On the

front of the head of the black variety are three tufts of long hairs which are entirely wanting in lighter colored males. Fig. 1a. Although males of both kinds pair with the same female their behavior when mating is different, for an account of which see Peckham's article in Occasional Papers of the Nat. Hist. Soc. of Wisconsin, vol. I, 1888.

The cephalothorax of the female is widest behind the middle and is there two thirds as wide as long. It is narrowed to half that width at the hinder end and slightly narrowed toward the front, the head being not much more than half as wide as the cephalothorax is long. Fig. 1. The top of the cephalothorax is flat, rising a little between the dorsal eyes and the front row of eyes is straight on the upper edge. The comparative length of the legs is 4, 1, 3, 2 and the fourth pair is as long as the body.

The male palpi are long. The tibial hook is straight and blunt and about as long as the tibia itself. The tarsus is short and wide and turned outward at the tip. The palpal organ is oval with a long tube bent around the end of the bulb with its point in the groove on the outer corner of the tarsus. Fig. 1c.

The epigynum has a small oval opening very far forward and a slight notch on the edge of the transverse fold. Fig. 1d.

This is an active species, living on plants in summer.

Eastern Massachusetts and New Haven and Meriden, Connecticut.

Marptusa familiaris Peckham.

Attus familiaris Hentz.

The female is 10 mm long and the male nearly as large. The fourth pair of legs is longest in the female and the first pair in the male. The cephalothorax and abdomen are both much flattened. The cephalothorax is rounded at the sides and nearly twice as wide in the middle as in front. The abdomen is twice as long as wide, widest in the middle and truncated at the front end and sometimes at the hinder end also. In the latter case the spinnerets are so far under the abdomen that they cannot be seen from above. The legs are long and stout, the fourth pair one and a half times as long as the abdomen.

The general color is gray, covered with long gray and white hairs. The cephalothorax has a dark brown band along the edge each side which is larger and darker in the males. The abdomen has in the middle a yellowish white marking, covering half its width, the front half straight and the hinder half notched at the sides. Pl. XIX, fig.

3. The legs are darker at the ends of the joints and lighter in the middle. The under side of the abdomen is light at the sides and has a dark stripe in the middle.

The male palpus has the tibia very short and the tibial hook is long and slender and slightly thickened at the tip. The tube of the palpal organ starts from the middle of the inner side of the bulb and turns obliquely across the end of the tarsus. Near the end of the tube but not quite reaching the tip is a short flat process. Figs. 3B, 3c.

Epiblemum scenicum Thorell.

Epiblemum faustum Hentz. *Salticus scenicus* Latr. *Calliethera scenica* Simon. *Epiblemum scenicum* Peckham.

Gray with white markings. On some the white marks are much more definite than on others, the gray ground having very few white scales mixed with it. I have usually found the spiders of this variety about houses, while those from the country, living on plants, have white as well as yellow scales largely mixed with the gray so as to obscure the white markings. The field specimens are usually more slender.

The front of the head around and above the eyes is white. There is a definite white stripe on each side of the cephalothorax and in the middle of the cephalothorax two white spots one on each side of the dorsal groove. On the abdomen there is a white stripe across the anterior end and two oblique marks on each side. Pl. XIX, fig. 2.

The legs are gray with white rings not very distinctly marked and the palpi white. The markings are very different from those of any other species.

The proportions of the body differ considerably in individuals, some appearing much longer and more slender than others. The cephalothorax is about two-thirds as wide as long and the abdomen usually about the same width and longer.

The epigynum is raised at the hinder edge, a little pointed and with a round notch about as deep as wide. The anterior half is a little narrowed and notched in the middle with a depression on each side, in the bottom of which is a round hole. Fig. 2e. The shape of the epigynum varies and in pale or freshly moulted females the internal parts may be seen through the skin as shown in Peckham's figure.

The males differ but little in color and markings from the females, but the palpi are large and the mandibles two-thirds as long as the cephalothorax and turned forward almost horizontally. Fig. 2a, 2c.

The tibia of the male palpus is shorter than the patella and at the distal end as wide as long, with a stout pointed hook directed forward and a little inward. Fig. 2f.

Found occasionally under stones or on bushes but common on the outside of houses and fences in the warmest and driest places. The colors resemble closely that of unpainted wood stained by the weather.

Common all over New England. A common European species.

Menemerus lineatus.

Icius lineatus Peckham. *Attus quadrilineatus* Peckham, 1883.

A small spider only 4 mm long and very distinctly marked with two white longitudinal lines on the middle of the abdomen and two others on the sides so far down that only the front ends of them can be seen from above. Pl. XIX, fig. 5.

The color in life is dark brown. The white lines on the back have their edges very dark. The cephalothorax and dark parts of the abdomen are thinly covered with long, slender, yellow scales mixed with a few white hairs on the front of the abdomen. On the under side of the abdomen are four white lines. The legs are dark brown, the first pair darkest.

The relative length of the legs is 1, 4, 2, 3. The first pair are twice as thick as the others. The top of the cephalothorax is flat two-thirds its length from the front. There is a short, transverse groove a little behind the dorsal eyes. The cephalothorax is widest across the middle but only very little wider than in front. The epigynum has a dark ridge behind, curved at the ends around two round holes. Fig. 5b.

Manchester and Medford, Mass.

Menemerus binus. *Attus binus* Hentz, not *M. paykullii* Peckham, 1885.

Female 9 mm long. Legs 1, 4, 2, 3. The cephalothorax is widest behind the middle and narrows slightly toward the front of the head where it is half as wide as long. The cephalothorax is flat above and a little swelled around the dorsal eyes. There is a short transverse groove behind the eyes. Pl. XIX, fig. 4.

The abdomen is half as wide as long, narrowed at both ends. The first pair of legs are about as long as the fourth pair, but twice as thick. The second pair of legs are slightly thicker than the third and fourth.

I have not seen the colors in life. In alcohol the cephalothorax is dark brown except around the edges where it is yellowish. The front half of the cephalothorax between the eyes is dark purple when turned to the light. The abdomen is white with two longitudinal black stripes that do not reach either end. The front legs are orange color with light brown stripes and a black spot near the end of each joint on the inner side. The other legs are dirty yellow with indistinct brownish stripes at the sides. Under the abdomen is a black middle stripe.

The epigynum has the openings very small and wide apart and the posterior notch very wide with square corners at the ends. Fig. 4a.

One female from Meriden, Conn. Mr. Peckham has the same species from Nebraska.

Neon nellii Peckham.

This is the smallest of our New England Attidae, being only 2.5 to 3 mm long with the cephalothorax not much over 1 mm. The general color is dark gray, darkest toward the head, so that the spider is hard to see on gray stones or weathered wood. The cephalothorax is high, the highest part being a little behind the middle, from which it curves downward to the front eyes and slopes more abruptly backward. The eyes are large and prominent, the first row nearly straight and as wide as the widest part of the cephalothorax. The posterior eyes are nearly as large as the front middle pair and are at the middle of the cephalothorax. The abdomen is a little pointed behind and the spinnerets are large for the size of the spider. Pl. XX, fig. 1.

The cephalothorax is smoky gray, darker toward the front and darker in the males than females. The abdomen is gray with yellowish white markings in a herring-bone pattern through the middle. The underside of the body is light gray or whitish. The legs are gray, darker toward the front.

The epigynum is large and has two rounded openings toward the front. Fig. 1b. The male palpi are also large and the palpal organ extends backward so as to cover the short tibia. The tube lies obliquely across the end of the bulb, its tip resting in a groove on the end of the tarsus. Fig. 1c.

A common species under stones and leaves at all seasons.

Euophrys monadnock, new sp.

One male was found on the upper part of Mt. Monadnock, N. H., on the rocks. Pl. XX, fig. 2. It is 4 mm long, the cephalothorax and abdomen about the same length. The legs are all long, relative length 4, 1, 3, 2. The ends of the palpi are white as far as the end of the femur. The tarsi of the first and second legs, and the tips of the tarsi of the third and fourth are white. The femora of the third and fourth legs are white, in life, light pink. The rest of the body is deep black. The first and second legs are a little thickened and the metatarsus, tibia and patella, and the end of first femur covered with long scales, as long as the diameter of the leg. The first and second legs are bright purple toward a bright light.

The front of the head is wide, and the sides of the cephalothorax nearly straight and parallel. Fig. 2c. The front of the head, below the eyes, slopes inward, and the sternum is short and wide. Fig. 2a.

The palpi are long and slender, the tarsus not much wider than the other joints. The tibial hook is straight and very slender, not much thicker than one of the hairs. Fig. 2d. The palpal organ is long and narrow at the base, where it extends over the tibia. The tube is short and curved around the end of the bulb. Fig. 2e.

A female, which probably belongs to this species, was found in Dublin, N. H., three miles from Monadnock. It is 5 mm long, with short and thin hairs and colors like *Tegenaria*. The cephalothorax has the sides straight and parallel, three-fourths its length from the front, and is a little rounded behind. Fig. 2f. The eyes are large and the lateral are more than half as large as the front pair. The posterior eyes are as far apart as the length of the front row, and little more than half as far from the lateral. The abdomen is oval, widest behind the middle. The legs are 4, 1, 2, 3, the front pair much thickened and the second slightly so. The cephalothorax is dark brown in front and lighter toward the back, marked with dark radiating lines. The abdomen is gray, with light, angular markings along the middle, and irregular oblique lines at the sides. The legs are without markings, the first pair darkest. The epigynum has two large openings about their diameter from the transverse fold. Fig. 2g.

Euophrys cruciatus, new sp.

This species is more generally covered with scales than *monadnock*, the front tibiae are less thickened, and do not have the long

scales of that species, and the colors are less bright and more like those of *Attus palustris*. The only specimen I have, a male, is 5 mm long. Pl. XX, fig. 8. The cephalothorax is three-fourths as wide as long, widest behind the middle. It is low in front, and the front row of eyes are turned a little downward, the lateral pair half their diameter, higher and farther back. The middle eyes are nearer the dorsal than lateral. The dorsal eyes are nearer together than the lateral pair. The abdomen is as long and as wide as the cephalothorax, widest in the middle and pointed behind.

The lengths of the legs are 4, 1, 3, 2, the fourth pair very long. The first and second pairs are a little thickened.

The cephalothorax of my specimen is so much rubbed that the markings are nearly destroyed; it shows only long black hairs over the eyes, and irregular white markings behind the eyes and at the sides. The abdomen is black, with a distinct white cross in the middle. Fig. 8. The legs have dark and light rings, which were probably covered with white and black hairs. The tibia of the palpi is light, and the other joints dark, with long hairs.

The tibia of the male palpus is wider than long. The tibial hook is nearly as long as the tarsus, and curved to fit along its edge. The tarsus is strongly curved downward. The palpal organ is oval, and the tube begins near the outer end, curves around its base and again outward through a groove in the edge of the tarsus to a notch near the end of the tibial hook. Figs, 8b, 8c, 8d.

Dublin, N, H., July 16.

Phlegra leopardus. *Attus leopardus* Hentz.

Very distinctly marked with two white lines on the cephalothorax, as far up as the dorsal eyes, and three white lines on the abdomen. The female is 8 mm long, the cephalothorax 3.5 mm. The cephalothorax is two-thirds as wide as long and a little widest behind the middle. The lateral front eyes are high enough for their middle to be opposite the top of the middle eyes. The dorsal eyes are unusually far forward; they are as far apart as the front lateral eyes, and two-thirds as far from the front of the head. Pl. XXI, fig. 1. The cephalothorax is rounded upward from the front to the dorsal eyes, and from there backward is flat more than half-way to the hinder end. The abdomen is widest in the middle and a little pointed behind. The legs are short, and their relative length 4, 3, 1, 2. The first and second pairs are thicker than the other. The cephalothorax is dark brown, darkest between the eyes. A white stripe extends

from the front of the head, over the eyes each side the whole length of the cephalothorax. A middle white stripe begins between the middle eyes, but fades out between the dorsal eyes. The legs are light brown, with two darker rings on each joint. The abdomen is brown, with a middle and two lateral white stripes. The abdomen is light on the under side and the sternum, legs and mouth parts dark brown. The epigynum has two large round openings near the hinder edge, and a small, square-cornered notch in the edge. Fig. 1b.

The male is darker than the female, but marked in the same way on the cephalothorax and abdomen. The white bands on the cephalothorax are mixed with red between the eyes. The legs are longer than those of the female, and not marked with rings.

The male palpus has the tibia short and wide on the upper side, with a deep notch on the outer side, and a short hook. Figs. 1c, 1e. The bulb of the palpal organ extends backward on the outer side so as to cover the tibia. Fig. 1d.

Female from Mt. Tom, Massachusetts. Male from Blue Hill, Milton, Mass. Another female was seen in Medford, Mass.

Hasarius Hoyi, Peckham.

Female 6 or 7 mm long. The cephalothorax is shorter and the abdomen larger than in the nearest species. Pl. XXI, fig. 2, 2a. The cephalothorax of the female is three-fourths as wide as long, and a little enlarged in the middle. The posterior eyes are two-thirds as far from the front row as from each other. Legs 1, 4, 2, 3, all nearly of the same length. First and second pairs a little thickened.

The markings vary, but in alcohol there is always a light marking across the back of the cephalothorax, a little behind the dorsal eyes and turning forward on each side as far as the front eyes. In front and behind this marking the cephalothorax is dark brown. On the abdomen there are light and dark oblique markings forming, especially in young individuals, a regular light herring-bone marking in the middle.

In life, the light markings are partly white and partly orange-brown. A brightly marked young male has the cephalothorax white in front, both above and below the eyes. Fig. 2. A white band on each side turning upward and inward behind the dorsal eyes, but not united in the middle. Hinder part of cephalothorax below and between the white bands black. There are two black bands behind the dorsal eyes, extending obliquely through the dorsal groove to the white

bands at the sides. The rest of the top of the cephalothorax is covered with orange scales.

Abdomen with a white band around the front and sides. Middle of the back black, with a few orange scales around the edges. Sides of the black patch irregularly scalloped. In the middle are oblique white markings, edged with orange-brown.

The legs are white at the ends and dark on the patella and tibia, and outer end of the femur. Ends of all the joints darker than the middle.

The epigynum has two large anterior openings near together, and behind and each side of them two other large openings near the edge. Fig. 2e.

The adult male has the colors much like the young male, described above, with the legs black on the patella and tibia, and part of the femur, and the rest white, with black at the ends of the tarsus and metatarsus. The female is various shades of brown, mixed with white and yellow scales and black hairs. Fig. 2b, 2c.

The male palpi are short, black at the base and white on the top of the tarsus. The tibial hook is long and blunt, extending along the side of the tarsus half its length. Fig. 2f, 2g. The palpal organ has the inner posterior corner swelled and extended inward to a blunt point. Fig. 2f. The tube curves around from the base to the tip of the tarsus.

A common species in eastern Massachusetts. Found also from the White Mountains to southern Connecticut.

Habrocestum splendens, Peckham.

♂ *Ergane splendens* Keys. ♀ *Pellenes nigriceps* Keys.

I have only seen the males of this species. It has been fully described by Peckham in his *N. A. Attidae* in the Transactions of the Wisconsin Academy, vol. vii, and figured and its mating habits described in vol. i, of Occasional Papers of the Nat. Hist. Society of Wisconsin, Milwaukee, 1889.

My males are 5 mm long, with the cephalothorax nearly 3 mm. The cephalothorax is widest and highest behind the second legs. The front part projects forward beyond the mandibles and the front eyes look a little downward. Pl. XX, figs. 5, 5b. The abdomen is shorter than the cephalothorax, widest in the middle, square in front and pointed behind. The legs are long and stout, the third pair longest. In alcohol the brilliant colors of the male fade, and the colors and markings resemble more those of the female. The cephalothorax is

dark brown, with a transverse light marking behind the eyes. The whole cephalothorax is thickly covered with light scales, and the front half with black hairs between them. The legs and palpi are light at the base and darker brown toward the tips, covered with scales and hairs, either black or various shades of gray. The abdomen is marked with three or four pairs of dark spots, united together more or less in different spiders, the front pair usually forming a single transverse mark, with a light mark in front of it. The light portions of the abdomen are yellowish in the middle, and bright copper-red at the sides.

The male palpi have the femur long, the patella about as long as wide, and the tibia half as long as wide. The tibial hook is large and flat, fig. 5d, and lies against the tarsus, nearly half its length. The tarsus is short and wide, and the bulb of the palpal organ flat and circular. The tube starts at the base and curves around the inner side, ending in a short groove, pointing outward on the end of the tarsus. Fig. 5c.

Beverly, Mass. Clarksville, near Albany, N. Y. Young in winter in old cocoons of *Argiope*, on marshes between Boston and Brookline, Mass.

Habrocestum peregrinum, Peckham.

These specimens have been identified for me by Mr. Peckham.

The female is 6 mm long, the male a little smaller; both sexes smaller than *H. splendens*. The area between the eyes slopes forward and is covered with short scales mixed with longer hairs, light brown in front and darker behind, where it meets a white marking pointed forward in the middle and curved backward and outward behind the eyes. Pl. XX, fig. 6. On each side of the cephalothorax is a white stripe, extending from the front lateral eyes backward under the eyes, and then curved upward and again downward to the end of the thorax. The abdomen has three white stripes, with black between, narrower and sharper in the male. The under side of the body and legs are light brown, with white and black hairs.

The legs of the third pair are very long in both sexes, and in the male there is a peculiar shape to the patella, fig. 6b, which is flattened and widened at the distal end, where there is a stout spine extending over the tibia. On the front of this flattened patella is a black spot. Mr. Peckham gives an account of the use of this ornamental patella in the pairing of an allied species in "Occasional Papers of the Nat. Hist. Soc. of Wisconsin, vol. i, No. 3, 1890." Peck-

ham's description says, two short spines on tibia of first pair, but my male has three pairs of spines on tibia and two pairs on metatarsus.

The male palpus differs little from that of *splendens*. The tibial hook is a little sharper, and the angle of the tarsus just over it, a little more prominent.

The epigynum has a simple round opening directed forward, from which a tube extends backward. Fig. 6a.

I have only three specimens—an adult male and female, and one immature male from Hyde Park, Mass. Mr. Peckham has it from New York and Connecticut.

Saitis pulex, Peckham.

Attus pulex Hentz. *Saitis X-notata* Keyserling. *Cyrba pulex* Keyserling.

A common spider 4 or 5 mm long, the female gray or brown of different shades, and resembling gray stone or dried leaves, on which it lives. The cephalothorax and abdomen are of the same length, the abdomen of the female wider than the cephalothorax, widest across the middle and pointed behind. Pl. XX, fig. 7a. The cephalothorax is half longer than wide, widest behind the middle. The eye-space is half wider than long, narrower behind than in front. The third and fourth pairs of legs are of the same length, and longer than the first and second. The cephalothorax has a light stripe in the middle, between the eyes, that narrows backward to a point at the hinder end. The abdomen has two nearly parallel light lines in the middle of the front half and behind them a transverse marking pointed at the sides, behind and around which are small, irregular light marks. The legs are covered with alternate dark and light spots.

The epigynum has two large openings near together, and near its hinder edge. Fig. 7g.

In the male the abdomen is smaller and narrower, the head higher and the colors brighter. Fig. 7. The cephalothorax, between the eyes and a little behind them, is black. The front and sides of the head below the eyes, and the hinder half of the cephalothorax are yellow, or orange. The abdomen is black with markings like the female. The legs have the tarsi yellow and the other joints indistinctly marked with longitudinal yellow lines. The palpi are yellow, except the ends of the tarsi which are black. On the under side the legs and abdomen are black. The coxae are yellow, with a black line in the middle and the sternum, maxillae and mandibles are yellow; the sternum sometimes with a black middle line. The male palpi

have the tibia very short, with a flat, thin hook. Fig. 7c, 7d. The tube of the palpal organ is short and curved in a circle on the end of the bulb so that the tip points inward. Fig. 7e.

Massachusetts and Connecticut.

Attus palustris, Peckham.

Female 6 mm long, male 5 mm. The cephalothorax is three-fourths as wide as long. The abdomen is short, a little wider than the cephalothorax and pointed behind. Pl. XX, fig. 3. The cephalothorax is light brown in the female and dark in the male, with a narrow, white stripe in the middle, widened between the dorsal eyes, and a white stripe each side, as high as the dorsal eyes. The abdomen has a wide, white transverse marking, just behind the middle, and several angular marks behind it. On the front half are two white spots. In the male the large middle marking is usually divided into two white spots.

The relative length of the legs is 4, 1, 2, 3 in the female, and 1, 4, 2, 3 in the male. The dorsal eyes are very far forward, little more than half as far from the front eyes as they are from each other.

The epigynum has a large oval opening divided in front into two. The hinder edge over the transverse fold has a small projection in the middle. Fig. 3c.

The hook of the tibia of the male palpus is nearly straight and has a short piece at the tip very narrow. Fig. 3b. The palpal organ is oval, and the tube extends from the base around the inner side, the end pointing outward. Fig. 3a.

Portland, Me.; Eastern Mass.; New Haven, Conn.

Attus sylvestris, new sp.

Male 4 mm long. Cephalothorax almost as wide as long. Abdomen smaller than cephalothorax; legs shorter and stouter than in *A. palustris*, and the male palpi nearly as large as in the male *palustris*, which is half larger. The colors resemble those of *Saitis pulex*. The legs are distinctly ringed with dark and light brown. The cephalothorax is dark brown, covered with lighter hairs, which are nearly rubbed off in the specimens. The male palpi have the tarsus dark brown, and the rest of the palpus lighter above but dark beneath. The tibia and patella are covered with white hairs that are very long on the sides of the tibia. The palpal organ resembles closely that of *A. palustris*, and is nearly as large. The markings

of the abdomen are dark and light brown, and resemble those of *Saitis pulex* and the female *A. palustris*. There is a large light mark across the middle of the abdomen, and behind it several light angular marks. In colors and general appearance this resembles *Saitis pulex*, and lives in the same places under stones and leaves.

Beverly and Middleton, Massachusetts.

Synemosyna formica, Hentz.

This is the most common ant-like spider, and the most ant-like among them. It is 6 mm long, and the cephalothorax is 2 mm long and 1 mm wide. The cephalothorax is narrowed behind and the abdomen in front and each has a deep depression near the middle. Pl. XXI, fig. 5. The pedicel of the abdomen is flat and widened behind, so that it is nearly as wide as the ends of the thorax and abdomen which it connects. The front middle eyes are large, and cover two-thirds of the front of the head. The rest of the eyes are very small. The legs are slender, their relative length 4, 3, 1, 2. The general color is black, with yellowish white markings. There is a triangular white spot in front of the dorsal groove, and one on each side widening downward, under the posterior eyes. On the abdomen there is a white stripe extending downward from the dorsal groove on each side, and uniting in a large white patch on the front of the under side of the abdomen. The second legs are entirely white, the first have a black stripe along the inner side, the third have the femur black and a black spot at the base of the tibia, and the fourth have the femur, the end of the patella and nearly all the tibia black, and black spots on the front of the coxae and trochanter, and black lines on the metatarsus. The palpi are white, sometimes with dark spots on the sides of the joints.

The front end of the abdomen has a hard piece on the under side from the pedicel to the epigynum, which extends upward on each side, so that the edges are visible from above. The epigynum has a wide oval opening, in the front part of which are two small openings to the tubes.

The males differ but little from the females in color and general appearance. The head is higher and narrower, and the mandibles a little longer, turned obliquely forward and curved apart in the middle. Fig. 5c. The male palpi are large. The tibia is short and has a very large hook. Fig. 5f. The palpal organ is large and only half covered by the tarsus. The tube passes completely around

the bulb, then passes through the usual groove to the outside of the tarsus, where it is coiled once around the flattened end. Fig. 5e.

This species lives on plants and matures early in the summer. At first sight it resembles an ant, but its gait is slower and steadier. I have never seen it jump but it runs quickly when frightened. It lives in summer on bushes, and matures in June. In the latter part of summer only young are to be found, and in the winter it hides under leaves on the ground.

Common at New Haven, Conn., and around Boston, Mass.

Salticus ephippiatus, Peckham.

Synemosyna ephippiata Hentz.

This spider is 7 mm long, the cephalothorax 3 mm long, and half as wide. In color and general appearance it resembles orange-brown ants. The cephalothorax is high in front and low behind the dorsal groove, which is in a slight depression. Pl. XXI, fig. 4a. The sides of the cephalothorax are nearly straight for two-thirds its length, and it is only slightly narrowed behind. The abdomen is oval, a little narrower in front than behind. The legs are long and slender, their length 4, 1, 3, 2. Fig. 4.

The colors are various shades of orange-brown, some individuals being very dark, and others pale. There is an indistinct light mark across the middle of the cephalothorax and across the abdomen, a little in front of the middle, and sloping backward down the sides nearly to the spinnerets.

The femora of all the legs are dark, except a light stripe on the front of those of the first pair. The patella and tibiae are all light on the upper side and darker beneath. The metatarsi of the hind legs are dark, the others partly light in the middle, or on the upper side. The tarsi of the front legs are dark, the others light. The coxae of the third legs are dark, the others light. The palpi of the female have the tibia and tarsus very much thickened and covered with stiff hairs on the under side. The palpi are colored as dark as the head. The epigynum has two small openings near together, and turned toward each other. Fig. 4c.

Eastern Massachusetts and New Haven, Conn., under leaves, and on plants in summer.

Synageles picata, Peckham.*Synemosyna picata* Hentz.

I have one young male from New Haven, Conn., that appears to be of this species. Pl. XXI, fig. 3. It is as large as adults sent me from Wisconsin by Mr. Peckham, but not as distinctly marked. The cephalothorax has the two white spots in the middle, but is not depressed at this part as in the adult. Fig. 3a. The coloring is more uniform than in the Wisconsin specimens. The white marks on the abdomen show indistinctly as do the markings of the legs. The specimen is 3.5 mm long.

The adults of both sexes have a slight elevation around the posterior eyes, and a distinct depression across the cephalothorax, just behind the eyes. Fig. 3b. The front legs of the female are twice as thick as the other legs, fig. 3c, and the front legs of the male are still thicker, especially in the femur and tibia. Fig. 3d. The patella and tibia are flattened in front, more in the male than in the female. The front of these legs, and the front of the cephalothorax of the male, are purple and iridescent in a bright light. In alcohol they become dark brown. The abdomen has two white stripes extending down the sides in the shallow depression across the front third. The abdomen in front of the depression is rounded, and sometimes swells in alcohol to an unnatural width. The hinder half of the cephalothorax and front of the abdomen are lighter colored than the parts before and behind.

EXPLANATION OF PLATES.

All plate captions are shown here in their original position, but they are also presented opposite each plate for ease of reference.

PLATE XVI.

Fig. 1. *Phidippus rufus*, female x 4; 1a, male x 4; 1b, female, nearly full grown; 1c, young; 1d, young soon after leaving the cocoon; 1e, epigynum; 1f, epigynum of another female; 1g, immature epigynum; 1h, male palpus; 1i, male palpus; 1j, brown scales from young female; 1k, yellow scale from young female.

Fig. 2. *Phidippus brunneus*, epigynum.

Fig. 3. *Phidippus mystaceus*, female x 4; 3a, 3b, male palpus; 3c, epigynum; 3d, posterior notch of epigynum of another female.

Fig. 4. *Phidippus ruber* Keys; male x 4; 4a, epigynum; 4b, male palpus; 4c, male palpus.

Fig. 5. *Phidippus tripunctatus*, female x 4; 5a, end of mandibles of male; 5b, male palpus; 5c, patella and tibia of male palpus; 5d, white scales from middle of abdomen.

PLATE XVII.

- Fig. 1. *Dendryphantes militaris*, female x 4; 1a, male x4; 1b, mandible of male, under side; 1c, mandible of male, upper side; 1d, male palpus.
- Fig. 2. *Dendryphantes aestivalis*, female of light variety x 4; 2a, cephalothorax of same female after wetting with alcohol; 2b, female of small dark variety; 2c, small male x 8; 2d, 2e, male palpus; 2f, epigynum.
- Fig. 3. *Dendryphantes montanus*, cephalothorax of female; 3a, cephalothorax of male; 3b, mandible of male; 3c, epigynum with two forms of posterior notch; 3d, 3e, male palpi.
- Fig. 4. *Zygoballus bettini*, female x 6; 4a, mandibles of male under side; 4b, male palpus.
- Fig. 5. *Zygoballus terrestris*, female x 8; 5a, mandible of male; 5b, epigynum; 5c, male palpus; 5d, outer side of tibia of male palpus.

PLATE XVIII.

- Fig. 1. *Icius palmarum*, female x 4; 1a, side of cephalothorax of female; 1b, front of head of a male with short mandibles; 1c, cephalothorax of male with long mandibles; 1d, under side of mandibles of male; 1e, epigynum; 1f, another pattern of dorsal markings of female; 1g, male x4; 1h, male palpus; 1i, male palpus, showing tibial hook.
- Fig. 2. *Icius mitratus*, male x 4.
- Fig. 3. *Icius elegans*, female x 4 ; 3a, side of cephalothorax ; 3b, front of head of female; 3c, under side of cephalothorax; 3d, male x 4; 3e, front of head of male; 3f, 3g, male palpus, 3h, epigynum.
- Fig. 4. *Icius elegans*, dark variety of male x 4; 4a, front of head; 4b, 4c, male palpus.
- Fig. 5. *Icius hartii*, female x 4; 5a, male from a Wisconsin specimen from Mr. Peckham; 5b, male palpus; 5c, tibial hook; 5d, epigynum.
- Fig. 6. *Icius formicarius*, female x 4; 6a, side of cephalothorax; 6b, epigynum.

PLATE XIX.

- Fig. 1. *Maevia vittata*, back of female x 4; 1a, dark variety of male x 4; 1b, light variety of male x 4; 1c, male palpus; 1d, epigynum.
- Fig. 2. *Salticus scenicus*, female x 4; 2a, male; 2b, side of cephalothorax of female; 2c, mandibles of male; 2d, male palpus; 2e, epigynum; 2f, tibial hook from above; 2g, tibial hook from side.
- Fig. 3. *Marptusa familiaris*, back of female x 4; 3a, front of head and mandibles; 3b, male palpus; 3c, side of male palpus without tarsus; 3d, side of cephalothorax of female; 3e, 3f, epigynum of two individuals.
- Fig. 4. *Menemerus binus*, female x 4; 4a, epigynum.
- Fig. 5. *Menemerus lineatus*, female x 4; 5a, end of mandible ; 5b, epigynum.

PLATE XX.

- Fig. 1. *Neon nellii*, back of female; 1a, side of female; 1b, epigynum; 1c, male palpus.

- Fig. 2. *Euophrys monadnock*, side of male; 2a, under side of cephalothorax of male; 2b, front of head; 2c, top of cephalothorax of male; 2d, 2e, male palpus; 2f, female; 2g, epigynum.
- Fig. 3. *Attus palustris*, female x 4, legs in a natural position; 3a, male palpus; 3b, tibial hook from outside; 3c, epigynum.
- Fig. 4. *Attus sylvestris*, male x 4.
- Fig. 5. *Habrocesium splendens*, male x 6; 5a, front of head; 5b, side of cephalothorax; 5c, male palpus; 5d, tibial hook.
- Fig. 6. *Habrocestrum peregrinum*, female x 4; 6a, epigynum; 6b, patella and tibia of third leg of male, front side.
- Fig. 7. *Saitis pulex*, male x 4; 7a, female x 4; 7b, cephalothorax of male, side view; 7c, male palpus; 7d, 7e, tibial hook; 7f, face of male; 7g, epigynum.
- Fig. 8. *Euophrys cruciata*, male x 4; 8a, front of head; 8b, male palpus from below; 8c, male palpus from side with tibial hook; 8d, end of the tarsus of male palpus; 8e, side of cephalothorax.

PLATE XXI.

- Fig. 1. *Phlegra leopardus*, female x 4; 1a, under side of cephalothorax; 1b, epigynum; 1c, male palpus from above; 1d, male palpus, under side; 1e, tibial hook, outer side.
- Fig. 2. *Hasarius hoyi*, young female x 4; 2a, same individual after keeping in alcohol; 2b, 2c, abdominal markings of adult females; 2d, dorsal markings of young female; 2e, epigynum; 2f, 2g, male palpus.
- Fig. 3. *Synageles picata*, young female x 6; 3a, side of young female; 3b, side of cephalothorax of adult female from Wisconsin; 3c, first and second legs of female x 12; 3d, first and second legs of male x 12, from Wisconsin specimens.
- Fig. 4. *Salticus ephippiatus*, female x 6; 4a, side of cephalothorax of female; 4b, palpus of female; 4c, epigynum.
- Fig. 5. *Synemosyna formica*, female x 6; 5a, side of female; 5b, under side of mouth parts of male; 5c, front of head of male; 5d, under side of front of abdomen of male; 5e, palpus of male; 5f, tibial hook; 5g, epigynum.

PLATES XVI—XXI.

PLATE XVI.

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- Fig 5. *Phidippus tripunctatus*, female x 4; 5a, end of mandibles of male; 5b, male palpus; 5c, patella and tibia of male palpus; 5d, white scales from middle of abdomen.

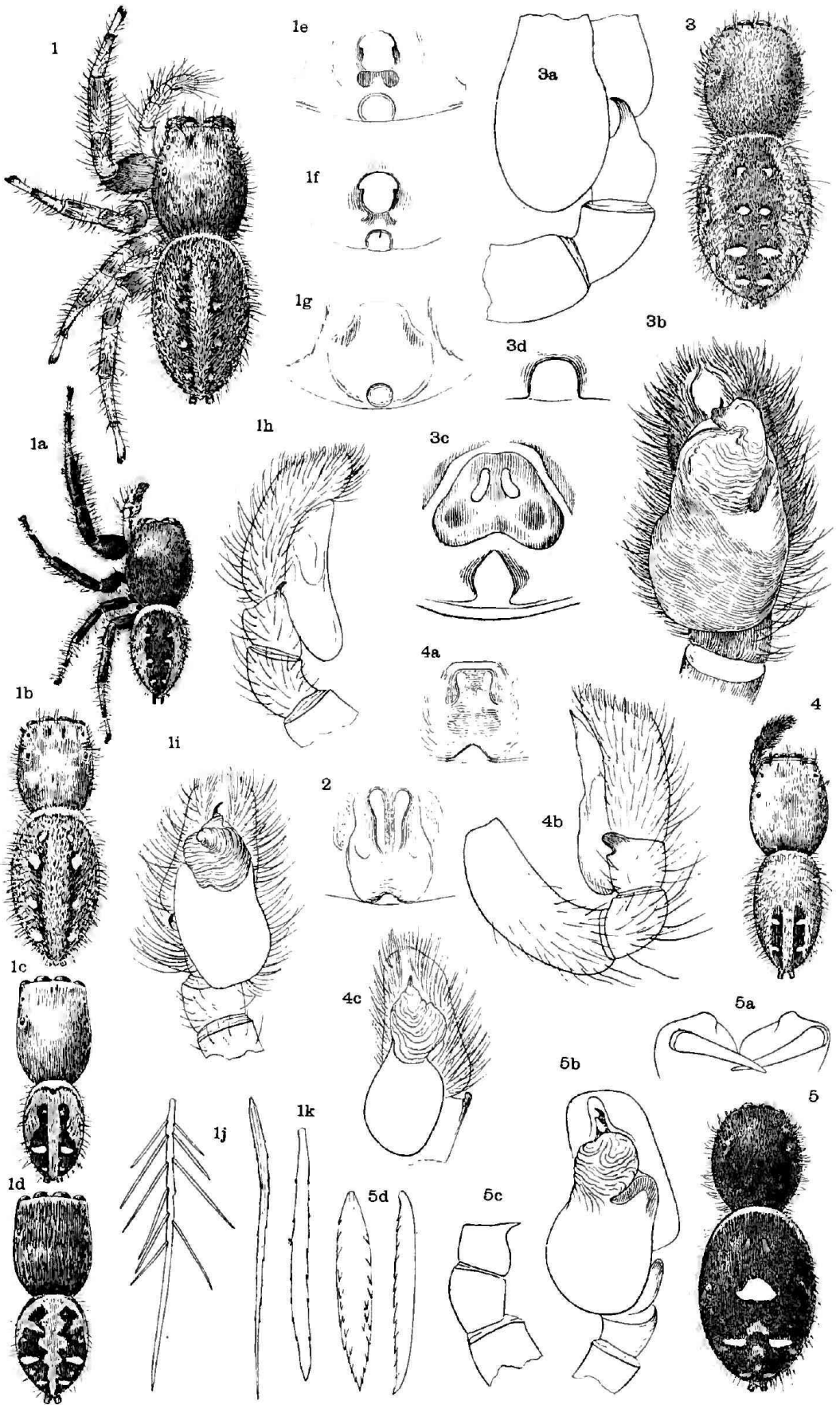


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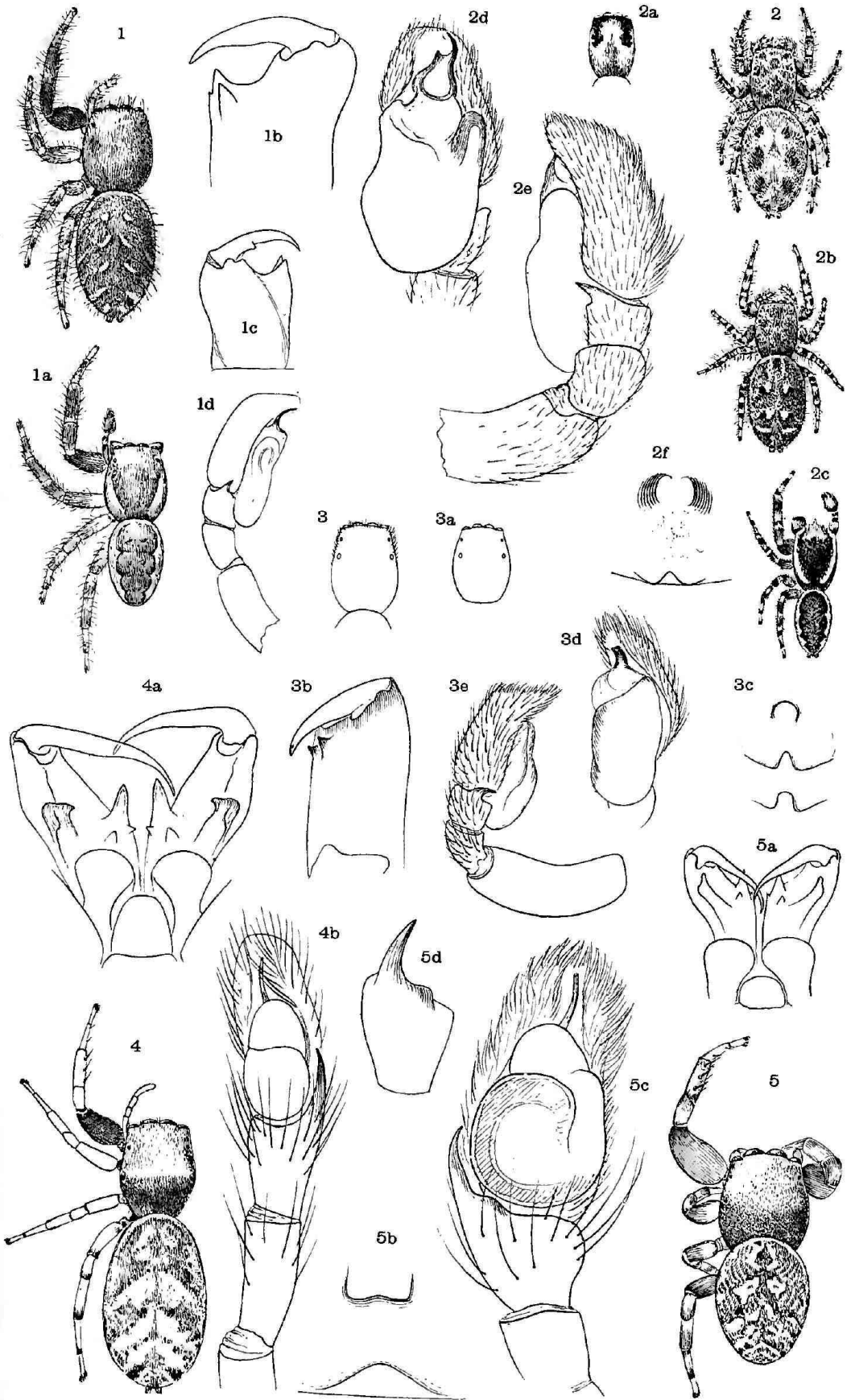


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- Fig. 3. *Icius elegans*, female x 4 ; 3a, side of cephalothorax ; 3b, front of head of female; 3c, under side of cephalothorax; 3d, male x 4; 3e, front of head of male; 3f, 3g, male palpus, 3h, epigynum.
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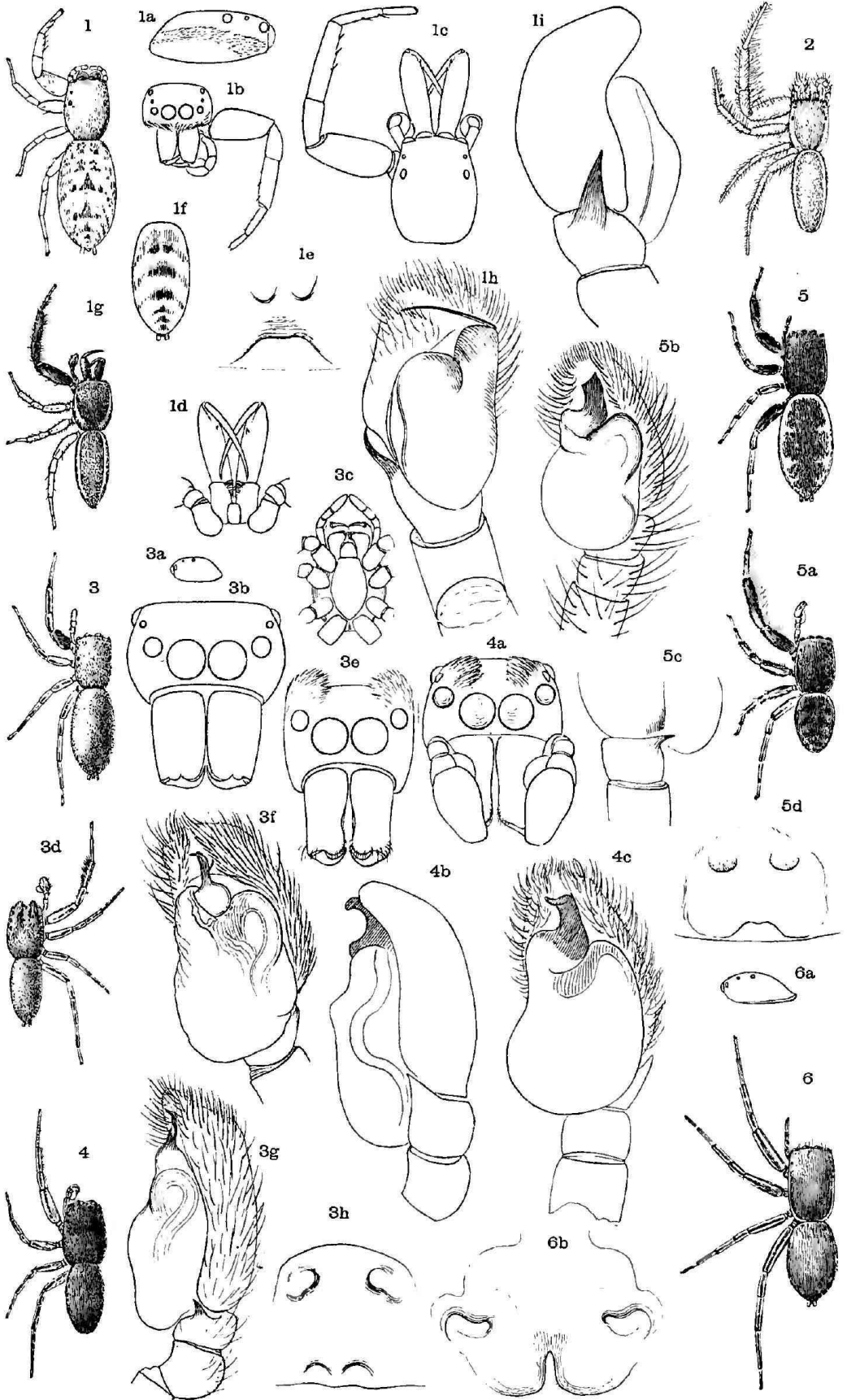


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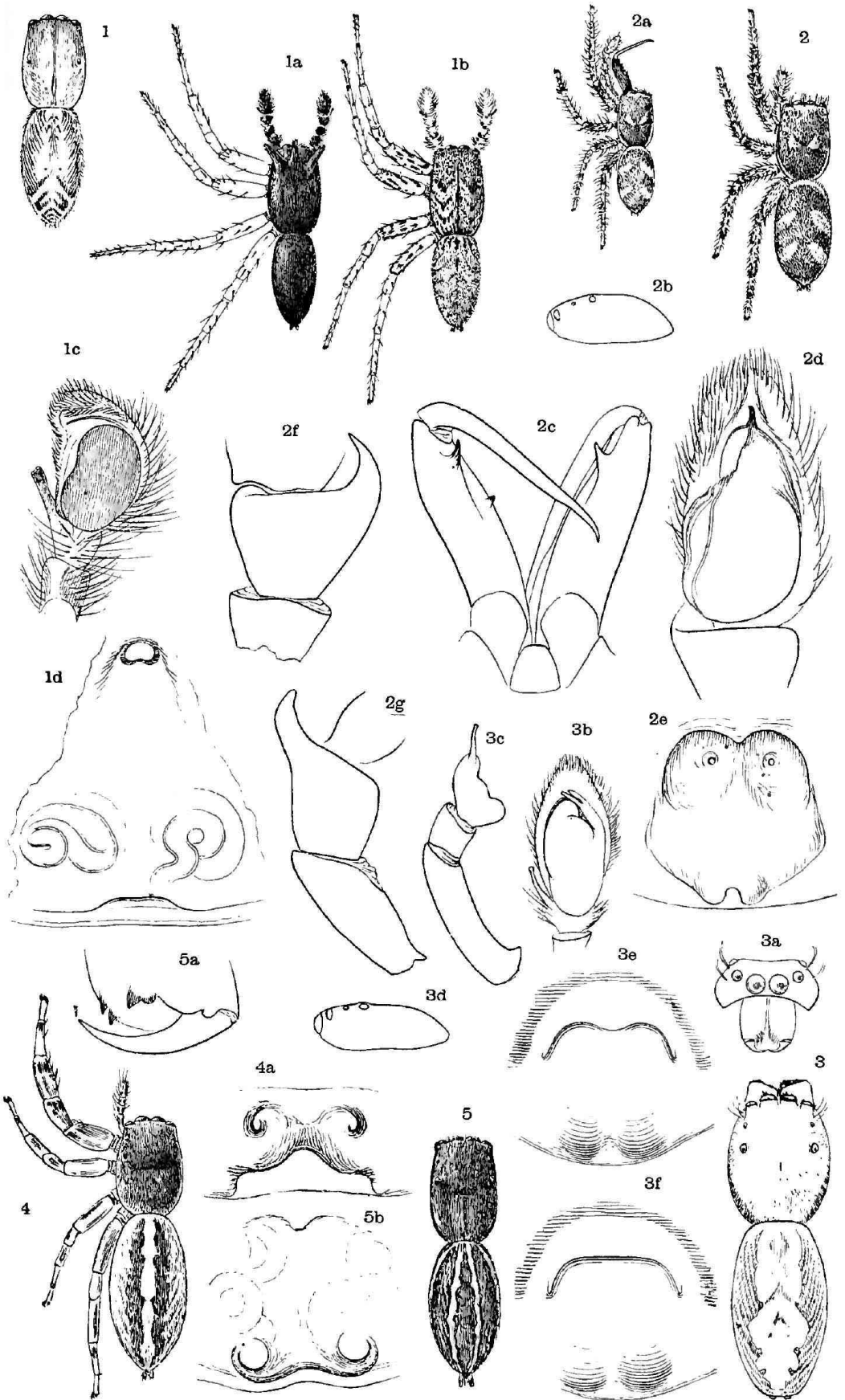


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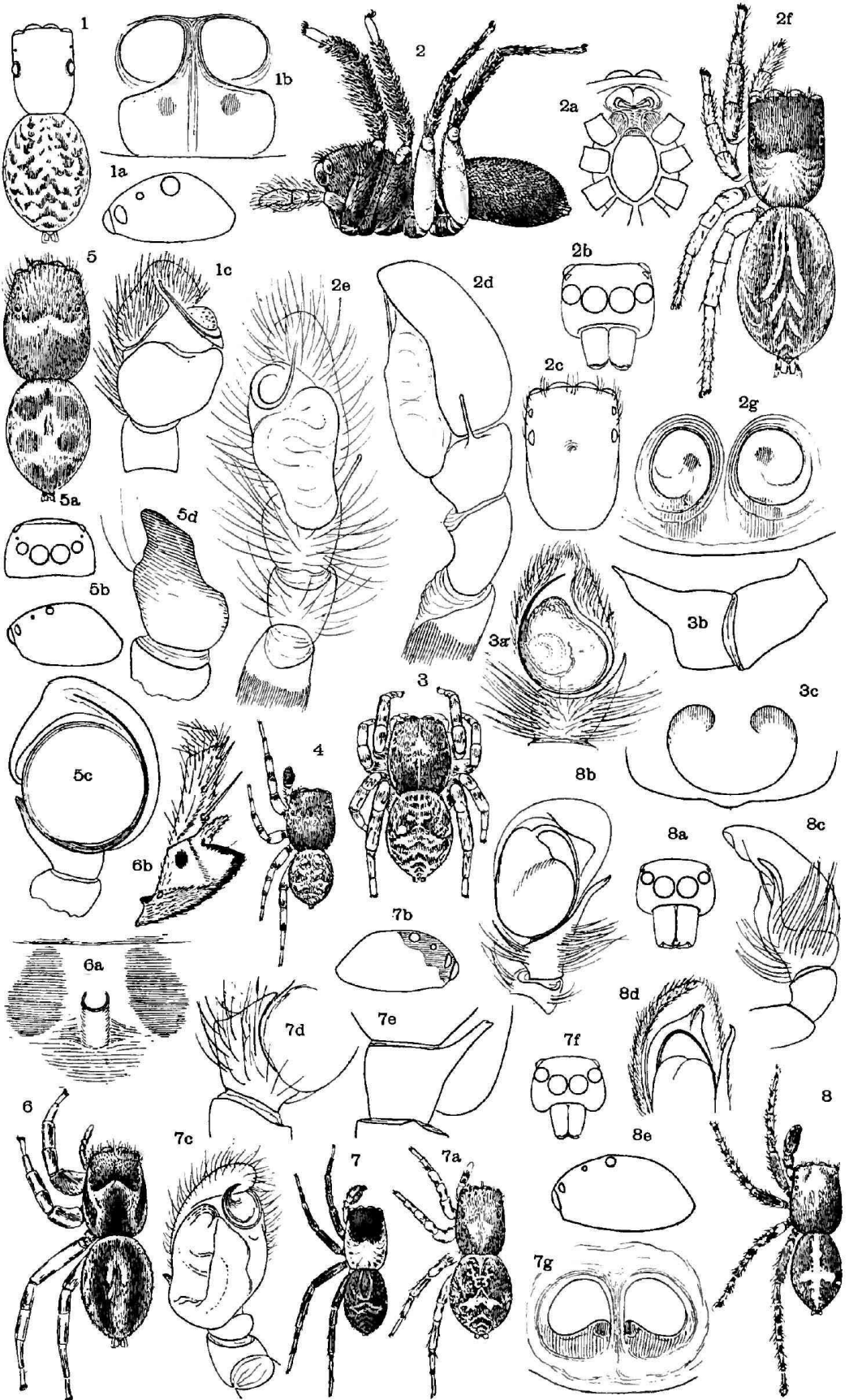


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