

**Descriptions of North American MYMARIDÆ with
Synonymic and Other Notes on Described
Genera and Species.**

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The Mymaridæ of North America have been so long neglected that it need not seem startling or surprising when I make the statement that the following pages comprise practically all of our known forms the great majority of which are described for the first time. This paper is based on material obtained from various collections, more especially those of the Illinois State Laboratory of Natural History, the Milwaukee Public Museum, the British Museum of Natural History and the United States National Museum. By far the largest part of the material and that of most value was from the latter collection. Museums have never had large collections of this family; that of our national museum, consisting of several hundred specimens, was and is undoubtedly the largest one of the family existing within a public institution, with the possible exception of certain European museums (that of the Königl. Zoologische Museum, Berlin, for instance); it is the most valuable collection, however, being definitely arranged and excellently preserved, whereas that of other institutions is unarranged and scattered.

I should not, however, omit one other source of material, namely my own efforts. During the past several years, I have brought together the largest collection of these minute insects ever before obtained and in the State of Illinois have found practically all of our forms represented. This collection combined with that of the National Museum forms the basis then for whatever results are shown here.

My own experience indicates that the genera of the Mymaridæ are few but each tolerably rich in species. Some of the latter are very numerous in individuals, widely distributed, as animals obviously very successful. In one or two instances, I have thought that a few of our species were

identical with European forms but so far the evidence seems to indicate that our fauna as represented by members of this family is quite distinct from that of other continents.

Family MYMARIDÆ.

Subfamily GONATOCERINÆ.

Tribe Ooctonini.

Genus OOOCTONUS Haliday.

1. *Ooctonus longipes* Ashmead.

As shown beyond, this species is a *Polynema*; there are no valid species of this genus in North America.

Genus CAMPTOPTERA Foerster.

1. *Camptoptera pulla* Girault.

An additional female specimen of this extremely small mymarid was taken from the window of a horse stable at Litchfield, Ill., July 13, 1910.

Tribe Gonatocerini.

Genus GONATOCERUS Nees.

1. *Gonatocerus dolichocerus* Ashmead. Ashmead, 1887, p. 192.
Normal position.

Female.—Length, 1.50 mm. Large for the genus. General color dark brown, the abdomen lighter at base and at the incisions of the abdominal segments giving it a striped appearance, the legs and antennæ concolorous but of the former, the trochanters, both ends of the femora and tibiae are lighter, pallid yellowish and the cephalic legs and tarsi are lighter throughout but not as light as the trochanters and tips of femora and tibiae; distal tarsal joint concolorous with thorax or the femora and the fourth tarsal joint somewhat darker than the others. Venation about concolorous with the general body color; antennæ uniform in color. Fore wings uniformly distinctly, though lightly, fuscated from the apex proximad nearly to the end of the long marginal vein (or practically the whole blade distad of the venation). Posterior wings hyaline. Eyes dark.

Fore wings moderately broad, regular in shape, the margins of the blade about parallel, the apex regularly rounded, broadest at the base of the distal fourth, more than half the distance from apex of venation to the apex of the blade; the edges of the blade dusky along the distal half; fore wings about three and one-half times longer than broad, their discal ciliation uniform, moderately dense (estimated about from 25 to 30 longitudinal lines across the widest portion of the blade), extending proximad to base of marginal vein. Marginal ciliation of the fore wing usual but short, the longest not half the length of the

marginal vein, only about a tenth as long as the greatest wing width, the longest about twice the size of the discal cilia and not any longer (subequal) than those of the posterior margin of the hind wings. Marginal vein very long for the genus, about twelve times longer than wide, about a fourth shorter than the slender submarginal vein, moderately broad, distad leaving the cephalic wing margin and terminating like a stigmal vein, the independent portion moderately short, curved concavely (its cephalic margin concave), the whole comprising about a fourth the length of the marginal vein and at its base there are two equal postular (clear) spots in a line transversely and three more in its apex; if treated as a stigmal vein it would be a moderately long, distinct one, without a knob and ending in an obtuse point. Posterior wings curved, acuminate, the apex acute, its discal ciliation consisting of a double row of cilia along each edge, the outer row more or less obscure, its cilia inclined outward, and distad three more or less regular rows, two short, not containing more than five or six cilia, the third (caudal) one longer, coming down the wing blade irregularly to its extreme base, crossing over before reaching the venation; or the first and second of these lines may be equal in length, not extending far proximad but much longer than the third; there are a few additional minute cilia proximad, caudad and disto-caudad of the venation. The latter straight, long, slender, slightly widening at tip. Marginal cilia like those of the fore wing, the longest subequal to the greatest width of the blade (across the apex of the venation).

Legs normal, the tarsi 5-jointed, the proximal tarsal joint much the longest but barely equal to any two of the others combined excepting the fourth and fifth, the distal four subequal, the fourth a little shorter than the others; tibiae all slender and longer than the femora; coxae large. Cephalic tibial spur long, slender, curved and forked at tip, forming a strigil and as long as the proximal tarsal joint (cephalic legs); other tibial spurs single, straight, shorter; trochanters 2-jointed. Cephalic proximal tarsal joint armed beneath with a row of stiff bristles. Caudal coxae conical. Posterior femora moderately stout.

Abdomen ovate, about equal in length to the head and thorax taken together, sessile, the ovipositor reaching to tip, not exerted, only its tip projecting slightly. Metathoracic spiracle minute, round. Body apparently without sculpture and with no conspicuous pubescence.

Antennae 11-jointed, filiform-clavate, moderately pubescent with short grayish hairs. Bulb of scape slender, moderately long, straight. Scape slightly longer than pedicel and first and second funicle joints combined, about as long as the first three funicle joints together, slightly convex beneath; pedicel short obconic, wider but not much longer than the proximal funicle joint; the latter shortest, distinctly longer than wide, cylindrical; funicle joint 2 longer and stouter; 3, 4 and 5 subequal, slightly longer and wider, 6 and 7 subequal, a fourth shorter, stouter, wider than long, about equal in length to 1 but dia-

tinctly stouter; funicle 8 rectangular, slightly shorter than 6 or 7, but still longer than wide; club ovate, moderately slender in one aspect, in the other moderately stout, equal in length to the three joints preceding when combined, pubescent, the setae short and in one aspect, apparently with a large number of glandular pores grouped along the whole length of that aspect (in reality, dense minute hairs); also with a few short, curved, longitudinal setae, arranged in pairs.

From 4 specimens, $\frac{3}{4}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Redescribed at first from four female specimens in the United States National Museum collection labelled "2793⁹¹. Par. in eggs of *Ceresa hubalus*, March 10, '87. From W. W. Thompson, Smithville, Ga." The original specimen of this species has since been found in the U. S. National Museum collection on a tag labelled in Ashmead's handwriting "*Gonatocerus dolichocerus* Ashm., Jacksonville, Fla." It has been remounted and designated on the type.*

Habitat.—United States: Smithville, Georgia; Jacksonville, Florida; Anna, Illinois.

Types.—Type No. 13,664, United States National Museum, Washington, D. C., 1 female in xylol-balsam (Florida).

Homotypes.—Four females in xylol-balsam, 1 slide (1 perfect specimen—3 imperfect ones), deposited in the collections of the Illinois State Laboratory of Natural History, Urbana, Illinois (Accession No. 11,216).

This species is similar to *Gonatocerus anthronomi* Girault described from the same general locality but differs in being decidedly more robust, more particularly in having a marginal vein of the fore wing which is about a fourth longer than in that species and in having broader fore wings. From the species *americanus* Brues it differs, according to the description of that species, in having much longer proximal funicle joints of the antennae, the first two taken together

* Subsequently, a female specimen has been found in the collections of the Illinois State Laboratory of Natural History, mounted on a tag numbered 3682; it was captured by sweeping in a strawberry field at Anna, Ill., July 31, 1883 (H. Garman); it has somewhat narrower fore wings. Remounted in balsam.

being decidedly longer than the pedicel, not so in *americanus*; also in general coloration. This is the first species described from North America but a number of other undescribed forms are known to me, most of which I describe beyond.

I have since examined the type of *Gonatocerus americanus* Bruce through the ready kindness of Dr. S. Graenicher of the Milwaukee Public Museum and through the courtesy of the director of that institution and it is found to differ further from this species in being smaller, much less robust, in having a shorter proximal tarsal joint of the posterior legs, a shorter marginal vein of the fore wings and narrower fore wings; also the posterior wings are narrower and the mid-longitudinal line of discal cilia is short and distad. The species *americanus* is closely allied with *anthonomi* but differs from it in being darker (a minor characteristic here), in having the first three funicle joints of the antennae unequal, about equal in *anthonomi* and by lacking the yellowish streaks on the mesoscutum. The diagnostic table of the North American forms of this genus, in which is included the following new species, will aid, I hope, in making the characteristics of all of the species stand out more clearly. The fifth North American species to be discovered is described herewith, upon which the descriptions of other common species are given.

2. *Gonatocerus rivalls* species nova.

Normal position.

Female.—Length, 1.00 mm. Moderate in size for the genus and with the usual habitus but more slender and graceful, the ovipositor together with its valves exerted for about a fourth or more of the length of the abdomen.

Black, the base (nearly basal third) of the abdomen contrasting by being pallid yellowish, yellowish brown or chrome yellow or orange. Base of the valves of the ovipositor (at the tip of the abdomen), intermediate and posterior coxae and trochanters, tarsi, cephalic trochanters and posterior femora (the latter nearly) concolorous with base of the abdomen; antennal scape and pedicel varying by being suffused more or less with pallid, especially ventrad on the scape, the remaining portion of the antennae black; knees and tips of the tibiae more or less pallid as are also most of the cephalic tibiae; distal tarsal joint in-

clined to be darker, so at extreme tip. Venation pallid dusky. Fore wings distinctly fumated especially distad (distal half of that portion of the blade distad of the apex of the venation); posterior wings nearly similarly fumated but the more distinct fumated area is still farther distad. Eyes dark. Mandibles dark fuscous. Uvipositor yellowish.

Abdomen sessile, as long as the head and thorax combined, conic-ovate, the valves of the ovipositor exerted as stated, the exerted portion subequal in length to the antennal club, clavate (broadening distad and somewhat paddle-shaped), appearing somewhat flattened (depressed), nearly as long as the femora. Parapsidal furrows complete, narrow, widely separated. Body bearing widely scattered, stiff setae. Metathoracic spiracle minute, round. Body without marked sculpture. Mandibles short, falcate, bluntly acute at apex.

Fore wings ear-shaped, moderately narrow for the genus, graceful for the genus, nearly uniformly ciliate discally (20 to 24 longitudinal lines at the widest blade portion), the discal ciliation moderately donec (the longitudinal lines difficult to count), distinctly denser distad, caudal bounded by a straight row of cilia running proximo-cephalad, obliquely across the wing, to the base of the marginal vein where the discal ciliation ends in a point. Marginal ciliation of the fore wing moderately short and usual for the genus, the longest cilia not quite as long as a fourth of the greatest wing width and distinctly not as long as the longest marginal cilia of the posterior wing. Marginal vein long and slender, distad leaving the costal margin, inclined obliquely. Posterior wings narrow, only slightly wider across the apex of the venation than the average width of the blade, acute at apex, narrowing gradually distad, without midlongitudinal discal ciliation but the two paired lines of cilia along each edge present as usual in the genus, the posterior paired line the more conspicuous; its marginal vein clavate slender, bearing a row of rather close-set, short setae (about 10); the marginal cilia moderately long, somewhat over twice longer than the blade is wide at its middle; posterior wings much shorter than the fore wings.

Legs normal, tarsi 5-jointed, the proximal joint longest but not long; tibial spurs single, straight, short, rather stout, but those of the cephalic legs longer, curved, forked at apex and forming the usual strigil; trochanters 2-jointed; cephalic and posterior femora somewhat thickened; tibiae all slender, longer than the respective femora; legs clothed with stiff setae but not densely.

Antennae 11-jointed, slender, the club slender, the flagellum filiform. Scape long, cylindrical, slightly convexed ventrad, including the bulbs equal to the club in length and as long as the pedicel and next two joints taken together. Pedicel usual, slightly longer than the proximal funicle joint, as broad as the scape. Funicle peculiar by reason of the fact that it bears joints alternately long and short: the proximal funicle joint is longer than wide but shortest, subequal however to 6; joints 2 and 3 of the funicle are subequal, nearly a half longer, longest but

each subequal to 5; 4 shorter, 5 longer, 6 still shorter than 4, a third shorter than 5, a fourth than 7; the latter again longer and 8 again shorter, a fifth shorter than 7 and consequently somewhat longer than than 6; club joint long and only slightly wider than the funicle, as long as funicle joints 2-4 combined, longer than the three preceding joints taken together, bearing four or five short, curved, longitudinal grooves. Antennae clothed with moderately short, soft, grayish pubescence on the funicle, somewhat shorter on the club and which is too dense to be arranged in distinct rows transversely or to be whorled.

From 4 specimens, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Described beyond.

Described from four female specimens mounted in balsam and all captured by the sweeping net as follows: One female captured by Mr. C. A. Hart and myself while sweeping along the edge of a cypress swamp, Pulaski, Illinois, May 14, 1910; a single specimen of the same sex captured by myself while sweeping along the edges of a brooklet running between an old orchard in sod and a cedar grove at Butler, Illinois, July 14, 1910; and two females captured in the same spot, July 21, 1910.

This species is interesting not only because of its foreign aspect and gracefulness but because it is very probably parasitic on the eggs of some aquatic insect as its habitat and structure would lead one to infer. It is also of interest because it either mimics or else is mimiced by an eulophid which I captured at the same time at Butler and mistook for specimens of this insect, and of whose difference I did not suspect until all of the specimens had been examined under the microscope. The eulophid has the same habitus and the same general coloration, the contrasting pale coloration of the base of the abdomen especially aiding the likeness of the two; it is a tetrastichine allied with *Syntomosphyrum* Foerster.

Habitat.—United States: Butler, Vienna and Pulaski, Illinois; Riley County, Kansas; Arlington, Virginia.

Type.—Type No. 11,679, United States National Museum, Washington, D. C., one female in xylol-balsam (Butler, Ill., July 14). *Colypes*.—Accession No. 44,272, Illinois State Laboratory of Natural History, Urbana, Illinois, three females in xylol-balsam, 2 slides (the 3 remaining specimens).

I have since found a single tagmounted specimen of this species in the collections of the United States National Museum labelled "*Gonatocerus basilaris* Ashm. ♀. Riley Co., Ks., F. Marlatt, Nov. 9. 2204. 1407." It has been re-mounted in balsam and deposited in the same collection. In dried specimens of this species, the ovipositor is likely to be withdrawn some distance toward the base of the abdomen and thus to appear non-exserted. This was the case with another specimen of this species captured by myself at Vienna, Illinois, October 12, 1910, on the windows of a stable. Still another female has been found subsequently in the collections of the National Museum mounted on a tag labelled "Arlington, Va." Thus this species is doubtless widely distributed in the United States.

What is undoubtedly the male of this species was found in the collections of the U. S. National Museum, mounted on a tag but with no labels. It is described herewith.

Male.—Length, 0.60 mm. Smaller and more slender than the female, the antennae longer than the body, the abdomen depressed, ovate. Antennae 13-jointed, filiform, slender. Flagellum joints moderately long, about four and one-half times longer than wide, the distal and proximal joints subequal, a fourth shorter than any of the others which are subequal, all longitudinally striate. Pubescence soft, sparse hairs. Femora stout. Otherwise as in the female.

From 1 specimen, same objective and optic.

The type *Gonatocerus anthonomi* Girault is a single tag-mounted specimen of each sex; I have seen four other paratypical specimens of the species, three of them originally tagmounted, all now in xylol-balsam. From the three tagmounted specimens it was learned that on the metathorax there are two lateral longitudinal carinae, one on each side of the spiracle but neither close to it, one being near the meson, the other nearly in the lateral aspect. The sculpture is scaly reticulation. The four paratypes* were reared at the same time with the types. The species is common in Illi-

* One of these paratypes, a female mounted on a slide, has been deposited as accession No. 44,240 in the collections of the Illinois State Laboratory of Natural History; and a male homotype, Urbana, Ill., May 30, 1910 as accession No. 44,217 of the same collection.

nois. I have captured both sexes of it with the sweeping-net at Urbana (July 1, 1910) and on the windows of a greenhouse in the same place (May 17, 31 and October 19, 1910); also Butler, Illinois, July 14, 1910 on stable windows (1 ♀).⁴ These specimens were somewhat lighter than the typical Georgia specimens, somewhat olivaceous, somewhat smaller and with slightly narrower fore wings. The yellow streaks on the scutum were distinct.

The type of *americanus* Brues is a single female mounted in xylol-balsam (formerly tag-mounted) labelled "*Gonatocerus americanus* Brues. ♀, 22,256. Type, Milw. Co., Wis. VI-8, 1906." It may finally turn out to be *anthonomi* which it certainly resembles very closely in structure. The male antennae in *anthonomi* have the funicle joints longitudinally striated.

The following new species—*brunneus*—is closely allied with *anthonomi* and *americanus*, but differs by its pure brown ochre color and structurally in having more slender antennae and in being smaller and more graceful. Otherwise it is certainly difficult to distinguish between these three species, though they appear to be distinct.

3. *Gonatocerus brunneus* species nova.

Normal position.

Female.—Length, 0.75 mm. Moderately small for the genus.

The same as the species *americanus* and *anthonomi* in general structures.

General color uniformly brown ochre, the legs and antennae concolorous, the tips of tibiae and the tarsi more pallid. Wings uniformly, slightly, infuscated, their ciliation brownish; intersegmental spaces of the abdomen lighter in color. Scape with a pallid ring just distad of the apex of the bulb.

Fore wings with the longest marginal cilia longer than any of the proximal tarsal joints, but not more than a fourth of the greatest wing

⁴ Also at Centralia, Illinois, August 25, 1909, 1 female on the window of a shed on a farm. And from the U. S. National Museum collections: one female labelled "Crevecoeur, Onaga, Kans. 412"; one female labelled "Oswego, N. Y., August 4, 1896". The species must be widely distributed in the United States. Subsequently, a female in the same collection labelled "*Gonatocerus mysteri* Ashm. ♀. Ohio. 1705".

width; posterior wings with the usual paired rows of discal ciliation around the edges of the blade and centrally a short midlongitudinal line running from the apex and containing about from 8 to 10 cilia. Proximal tarsal joints not long but longer than any of the other four, moderately long.

Antennæ slender, the funicle subclavate; scape together with its rather long bulb equal in length to the combined lengths of the pedicel and first four funicle joints, slender, slightly thickened in the middle. Pedicel usual, obconic, distinctly longer than either of the first four proximal funicle joints, but slightly shorter than any two of them combined, wider than the scape or any part of the funicle; first four funicle joints subequal in length, slightly longer than wide, small, slender, but 3 and 4 of funicle subequal in size, wider than 1 and 2; funicle 5 is abruptly longer, twice the length of 3 or 4, cylindrical, wider, about equal to pedicel in length; 6 is shorter and somewhat narrower than 5, but a third longer and wider than 3 or 4; 7 of the funicle larger, somewhat longer and wider than 5, the longest funicle joint; 8 is slightly broader than 7 but shorter than 5 or 7, a fourth longer than 6. The club is slender, long-ovate, as long as the three preceding joints combined, shorter than the scape. It bears a few longitudinal grooves.

From 2 specimens, $\frac{2}{3}$ -inch objective, 1-inch objic, Bausch and Lomb.

Males.—The same but lighter in color, the base of the abdomen above, intermediate femora and fore part of thorax beneath, cream yellow; flagellar joints strongly striated longitudinally, concolorous with body.

From 2 specimens, the same magnification.

Described at first from two female specimens found tag-mounted in the U. S. National Museum collections labelled simply "Ind". They have been remounted in balsam. This species is similar to *English* specimens in my possession labelled *Gonatocerus flavus*, but for the present I consider them distinct.

Habitat.—United States: Indiana; Illinois (Urbana, Mattoon, Centralia).

Types.—Type No. 13,803, United States National Museum, Washington, D. C., two females in xylol-balsam (1 slide, Indiana). *Cotypes*.—Accession No. 44,237, Illinois State Laboratory of Natural History, Urbana; one female in xylol-balsam (Urbana, Illinois).

Subsequently, the following specimens: Captured at Ur-

Urbana, Illinois, in sweepings, two males, May 25, 1910, on greenhouse windows, one female, May 23, 1910; at Centralia, Illinois, the form described below, one female, August, 1909, on a window; at Mattoon, Illinois, two females together on the window of a horse stable, July 16, 1910.

There is a color variety of this species, at first thought to be distinct from it but since considered the same, as both forms agree structurally; this variety agrees with *aureus* in color. It is described herewith.

Gonatocerus brunneus tenuipennis varietas nova.

Normal position.

Female.—Length, 0.65 mm. Moderately small for the genus.

The same as *brunneus*, differing in being somewhat lighter in color, the thorax, head and base of the abdomen pale ochraceous yellow, the rest of the abdomen dusky brown, in being smaller in size and primarily in having somewhat more slender fore wings; the antennae are olive greenish and differ from those of *brunneus* in not having the sixth funicle joint quite so distinctly shorter than the joint immediately preceding and following it. Its legs are uniformly concolorous with the body or a shade lighter. The marginal cilia of the fore wings are equal to a third of the greatest width of those wings. The posterior wings are very narrow, and bear no discal ciliation in the midlongitudinal line.

Antennae like those of *brunneus*; funicle joints 5, 6 and 7 subequal, nearly equal to the pedicel in length, twice the size of 3 or 4, 8 a fourth shorter. The club large, ovate, abdomen short, triangular.

From 2 females, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen captured on a window in a woodshed on a farm at Centralia, Illinois, August, 1909, and another by sweeping, Urbana, July 1, 1910.

Habitat.—United States: Centralia, Urbana, Illinois.

Type.—Accession No. 44,214, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam (Centralia, Ill.).

4. *Gonatocerus aureus* species nova.

Normal position.

Female.—Length, 0.80 mm. Moderately small for the genus.

Belonging in the same group with *americanus* and *anthracinus* and differing from them in being pale cadmium yellow in color, colored in

fact like *brunneus tenuipennis*, primarily in having the fourth funicle joint over half as long (two-thirds as long) as the fifth (twice longer than wide), much longer than the third, not so in either *americanus* or *anthracinus* (nor *brunneus*) where the fourth funicle joint is not more than half as long as the fifth and distinctly not over twice longer than wide; it differs from *tenuipennis* as can be inferred from what has been stated by having the somewhat broader fore wings, and in antennal structures, *tenuipennis* having the fourth funicle joint short, no longer than the third or but very slightly longer and only about half as long as the fifth funicle joint. Otherwise it is the same as *brunneus tenuipennis*. Antennal scape and pedicel, however, somewhat more yellowish than the dusky olive-green flagellum.

Antennæ 11-jointed; first two funicle joints subequal, longer than wide, but not very much so; funicle 3 longer by a fourth, one and one-half times longer than wide, funicle 4 still longer, twice longer than either 1 or 2, subequal in length to pedicel, slightly over twice longer than wide, very slightly enlarged; funicle 5 about a third longer, stouter, longest joint of the funicle; 6 and 7 subequal, slightly wider and shorter; 8 slightly wider, shorter than 7, slightly longer than 4. Scape slender. Proximal tarsal joints moderately long.

From 3 specimens, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from three female specimens in balsam, captured by sweeping miscellaneous vegetation, Urbana, Illinois, July 27, 1910, and at Du Bois, Illinois, June 23, 1910.

Habitat.—United States: Urbana, Du Bois, Illinois.

Type.—Accession No. 44,215, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam (on a slide with *Polynema* and other mymarids); type locality, Urbana, Illinois.

5. *Gonatocerus maximus* species nova.

Normal position.

Female.—Length, 1.35 mm. Large for the genus.

Similar in general to *delichocerus* Ashmead but agreeing also with *nigritarsis* Ashmead by reason of antennal structures but falling in between these two species. It agrees more with the former especially in coloration and in the shape of the fore and posterior wings, but the proximal three funicle joints of the antennæ are shorter, agreeing in this respect nearly with *nigritarsis*. Coloration like that of *delichocerus*; fore and posterior wings similar to those of that species, the marginal vein similar; antennæ differing in having the first and second funicle joints about equal, each distinctly shorter than the pedicel,

the second slightly longer than the first, each also distinctly shorter than the third funicle joint by at least a third; moreover the third funicle joint is shorter than the pedicel and distinctly longer by a fourth than funicle 1; thus funicle joint 4 instead of being subequal to 3 and distinctly longer than the pedicel, is shorter than both. The proximal tarsal joint of the caudal legs is shorter than 1: *dolichocerus*. From *nigritarsis* this species differs in antennal structures by having the fourth funicle joint shorter than the third; its posterior wings are much broader and the coloration of the legs and venation much darker.

From 1 specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen captured at Pulaski, Illinois, May 14, 1910, by sweeping along the edges of a cypress swamp (C. A. Hart and A. A. Girault).

Habitat.—United States: Pulaski, Illinois.

What is perhaps the male of this species was found in the collections of the U. S. National Museum mounted on a tag labelled "27 July, 1894. Ithaca, N. Y."

Type.—Accession No. 44,217, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam (the female specimen in foregoing).

6. *Gonatocerus fasciatus* species nova.

Normal position.

Female.—Length, 1.05 mm., mean. Large, the fore wings broad, the color brown-black or fuscous. Ovipositor not exerted.

The same as *maximus* and *dolichocerus* but differing from both in having a distinct transverse fascia crossing the wing proximad from the end of the marginal vein. It agrees with the former in having the posterior wings not so broadened across the apex of the venation, but differs from it again in having the proximal funicle joints longer as in *dolichocerus* yet more slender and shorter than in that species. At first the species was mistaken for the last-named species. It is similar to that species in all structures excepting as pointed out. Moreover, it agrees in having the long marginal vein and in general coloration, excepting the fascia on the fore wings. From the species *nigritarsis*, the fourth species of the large, robust *Gonatoceri*, it differs in its darker legs, the longer marginal vein of the fore wings and proximal antennal joints and the broader blade of the posterior wings. The following details are all that it is considered necessary to add:

Fore wings with about thirty (or more) longitudinal lines of discal cellation across their widest blade portion, crossed at the end of the

marginal vein by a distinct transverse fuscous fascia which is obliques somewhat proximo-caudad; posterior wings acute at tip, almost abruptly, with but one or two cilia in the midlongitudinal line of the blade near apex, sometimes several more farther proximad; the longest marginal cilia of the posterior wing are distinctly longer than those of the fore wing, slender, about twice longer than the mean width of the blade.

Proximal funicle joint of antennae twice longer than wide, barely shorter than the pedicel; funicle joints 2 and 3 subequal, a fourth longer, each distinctly longer than the pedicel, yet not very much longer, still slender; 4 somewhat longer and a little stouter than the preceding joint; 5 stouter but about of the same length as 4, subequal in length to 3, cylindrical; 6 and 7 distinctly shorter, subequal, cylindrical-ovate; 8 still shorter. The club usual. Pubescence as in *dolichocerus*.

From 3 specimens, $\frac{1}{2}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from three female specimens, two of which were found in my personal collection labelled "Arlington, Va., July 6"; the third specimen was found in the National Museum collections and was labelled "Washington, D. C., office window. C. N. Ainslie, Collector."

Habitat.—United States: Arlington, Virginia, and the District of Columbia.

Type.—Accession No. 44,238, Illinois State Laboratory of Natural History, Urbana, Illinois, two females in xylol-hal-sam, 1 slide (Arlington, Va.).

7. *Gonatocerus novifasciatus* species nova.

Normal position.

Female.—Length, 1.05 mm. Large for the genus.

The same as *fasciatus* but the stripe across the proximal part of the fore wings is broader and less regular and situated somewhat farther distad, just beyond the apex of the marginal vein, not embracing that apex or just before (proximad) it, as in the other species. Also the marginal vein of the fore wings is decidedly shorter and the proximal funicle joint also, instead of being twice longer than wide and over three-fourths the length of the pedicel, is subquadrate, barely longer than wide (if not wider than long) and not half as long as the pedicel. The posterior wings also differ in having a single midlongitudinal line of discal cilia which is complete, extending far proximad. Moreover the legs and antennae are decidedly darker, uniformly very in-

tense dark brown, only the trochanters and three intermediate tarsal joints being lighter, the former suffused with pallid, the latter pallid lemon-yellow. The scape is somewhat more dilated. Otherwise as in *fasciatus*. Metathorax apparently bicarinate at the meson.

Antennae 11-jointed; scape as long as the pedicel and first three funicle joints combined; pedicel twice the length of the proximal funicle joint; funicle joint 2 twice longer than 1, slightly shorter than the pedicel; 3 twice longer than 2 and decidedly broader; 4 and 5 subequal, somewhat shorter (4 slightly shorter than 5), somewhat stouter; 6 and 7 subequal, somewhat shorter than 4; funicle 8 still shorter, slightly longer than 2 but much wider. Club long, as long as the combined lengths of joints 3, 4 and 5 of the funicle. Pubescence usual.

From 1 specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen mounted on a tag, found in the collections of the United States National Museum, Washington, D. C., and labelled simply "Tenn." The specimen has been remounted in xylol-balsam.

Habitat.—United States: Tennessee.

Type.—Type No. 13,804, United States National Museum, Washington, D. C., one female in xylol-balsam.

8. *Gonatocerus maga* species nova.

Normal position.

Female.—Length, 0.95 mm. Moderate in size for the genus; ovipositor exerted.

Similar in appearance to *rivalis* but differing in color—the base of the abdomen is not conspicuously colored with yellow or yellowish but the body is black, the abdomen brownish-black, darker in the middle; the venation of the fore wings is darker, the fore wings themselves with the longest marginal cilia somewhat shorter than those in *rivalis*; the legs are more uniformly dark, the antennae uniformly black and differing in structure—thus the sixth funicle joint is not distinctly shorter than the joint immediately preceding and that following, but is subequal in size to the latter, distinctly broader than the preceding joint and fully as long; further, in this species, the widening of the funicle is distinct at the fifth joint, more gradual in *rivalis*; the second and third funicle joints in *rivalis* are longer than in this species. Again the fore wings are not pronouncedly fumated at the distal portion of the blade but very slightly uniformly fumated throughout with the exception of the usual clear, rectangular space proximal, under the submarginal vein. The exerted valves of the ovipositor are some-

what shorter in this species and uniform in color. The posterior wings differ in that in the midlongitudinal line from the apex there is a single line of cilia (seven or eight cilia). Proximal tarsal joints longer than in *rivalis*.

Trochanters, knees and tips of tarsi pallid; tip of abdomen suffused more or less with pallid; posterior wings hyaline, their longest marginal cilia much longer than those of the fore wing. Otherwise as in *rivalis*.

Antennae 11-jointed. Proximal and distal funicle joints shorter the latter slightly longer and distinctly broader, ovate; both slightly shorter than the pedicel; funicle widening distinctly at joint 5; 2 slightly longer than 1, subequal in length to the pedicel; 3 and 5 longest, 4 slightly shorter than 3; 6 slightly shorter than 5, subequal to 7. Club equal to joints 2, 3 and 4 of the funicle, similar to that in *rivalis*.

From 1 specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen captured on the window of a stable at Litchfield, Illinois, July 13, 1910.

Habitat.—United States: Litchfield, Illinois.

Type.—Accession No. 44,239, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam.

9. *Gonatocerus latipennis* species nova.

Male.—Length, 1.30 mm. Large.

Allied with *dolichocerus* but differing in having a somewhat broader fore wing with the marginal vein shorter than in that species; otherwise it is nearly similar, differing colorationally in that the trochanters and knees of the legs are less noticeably pallid and the wings perfectly hyaline. The fore wings at their widest blade portion bear about from forty-five to fifty longitudinal lines of discal cilia (in *dolichocerus* only about from twenty-five to thirty-one or two); the posterior wings are nearly similar to those in the Ashmeadian species, but their marginal cilia (caudal margin) are longer. Another noticeable difference (though which may be more apparent than real) is that in this species the discal ciliation of the fore wings terminates abruptly proximad before attaining the marginal vein, thus the wing is naked caudad of the venation, whereas in *dolichocerus* this ciliation is projected triangularly proximad, the cilia being present caudad of the venation.

Antennae 13-jointed, filiform, the joints of the flagellum cylindrical and longitudinally striate and with the exception of the discal joint, acute or apined at the disto-lateral angles. Scape and pedicel normal; first funicle joint very much longer than the small, triangular pedicel, somewhat shorter than the second funicle joint; the latter somewhat

shorter than the third funicle joint, the first and second funicle joints being cylindrical ovate; funicle joints 3 to 10 cylindrical, subequal, about thrice longer than wide. Distal or club joint conic-ovate, slightly shorter than the preceding joint, long. Pubescence sparse.

From 1 specimen, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Female.—Unknown.

Described from a single male specimen found mounted on a tag in the United States National Museum collections and which bore the following labels: "13-5", "285" and in Ashmead's handwriting "*Gonatocerus atratus* Ashm."; "*Caraphractus harringtonii* Ashm." Remounted in xylol-balsam.

Habitat.—North America: (?) Canada.

Type.—Type No. 13,805, United States National Museum, Washington, D. C., one male in xylol-balsam.

10. *Gonatocerus pygmaeus* species nova.

Normal position.

Female.—Length, 0.60 mm.; small for the genus.

Allied with the species grouped with *anthonomi* and *americanus* and more especially with *arens* and *brunneus*; it may be distinguished at once by means of the fact that the third funicle joint of the antennae is somewhat lengthened, longer than the fourth and still longer than either of the two proximal funicle joints. In coloration it is similar to *anthonomi* but differs in having the base of the abdomen yellow. Fore wings slightly fuscated throughout.

Fore wings with about from nineteen to twenty-three longitudinal lines of discal cilia across the widest blade portion, the discal ciliation fine and moderately dense, absent (with the exception of one or two cilia) in the shape of a small triangular clear space just out from the oblique limiting line of cilia which runs caudo-distad from the proximal end of the marginal vein (in the other, allied species, this area has five or more cilia in it, in some nearly as densely ciliate as the main portion of the blade). Marginal cilia of fore wings moderately short, the longest not quite a fifth the greatest wing width. Otherwise as in the allied species.

Antennae normal; scape long and slender, nearly as long as the pedicel and first three funicle joints combined, slenderer at each end; pedicel obconic, distinctly larger than the first two funicle joints separately and as long as any of the funicle joints. Funicle joints 1 and 2 subequal, rectangular, 2 slightly longer; 3 subpyriform, enlarging somewhat distad, a third longer than 2 and a fourth longer than 4; the latter wider, cylindrical ovate; funicle joints 5 and 6 subequal to

or slightly longer than 3, cylindrical; 7 slightly shorter and wider and 8 subequal to 6 but somewhat wider. Mandibles with three subequal, rather minute teeth. Sometimes funicle joint 3 longest, when, excepting the two proximal joints, the others of the funicle are cylindrical-ovate, subequal and shorter than 3, giving the funicle a more compact appearance.

From 5 specimens, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from five females on tags, now remounted in xylol-balsam, found in the collections of the United States National Museum, Washington, D. C., bearing this label: "Miss."

Habitat.—United States: Mississippi.

Types.—Type No. 23,821, United States National Museum, Washington, D. C., four females in xylol-balsam, 1 slide.

Cotype.—Accession No. 44,249, Illinois State Laboratory of Natural History, Urbana, Illinois; one female similarly mounted.

11. *Gonatocerus texanus* species nova.

Normal position.

Female.—Length, 0.55 mm. Small in size for the genus.

Falling in the group containing *anthonomi* but differing from it and allies by possessing a shorter marginal vein of the fore wing and in being smaller; also the fore wings are more densely and finely ciliate, the discal ciliation finer and denser than with any species of the genus. The antennae also differ in that the joints are all shorter.

General color dark brown, the venation and proximal three tarsal joints lighter brown; wings hyaline or very slightly fumated, more noticeable at the venation and proximal of it.

Fore wings moderate in width, with about from nineteen to twenty-two longitudinal lines of discal cilia, the latter short and fine, moderately dense, continuing caudad beneath the venation to the oblique limiting line of cilia; marginal cilia moderately short, only about a fourth of the wings greatest width; marginal vein only about six times longer than wide, moderately short, about as long as the united length of the proximal two tarsal joints. Posterior wings very slender, with the usual discal ciliation.

Parapsidal furrows complete; ovipositor not exerted. Vertexal carina present. Tibial spurs single, small, but those of the cephalic legs much larger, curved and forked, forming a scragli. Tarsal joints short, the proximal ones distinctly longer than the others, but only

moderate in length, not long, rather short for this genus. Trochanters 2-jointed. Tarsi 5-jointed.

Antennae 11-jointed; scape long and slender, its bulb long, the scape clavate, equal in length to the pedicel and first four funicle joints combined; pedicel usual; first three funicle joints subequal, barely longer than wide, each not half the length of the pedicel; joint 4 still small, slightly longer than 3; joints 5 and 6 subequal, each a fourth longer than joint 4, oval, distinctly shorter than the pedicel; joints 7 and 8 larger, subequal, over a third longer than joints 5 and 6, rectangular, nearly as long as the pedicel; 9 is somewhat shorter than 7. All funicle joints shorter than pedicel.

From 3 specimens, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from three female specimens remounted in xylol-balsam from tags in the United States National Museum collection, bearing the label "College Station, Tex. Sept. Banks. *Alaptus* ♀."

Habitat.—United States; College Station, Texas.

Types.—Type No. 13,823, United States National Museum, Washington, D. C., two females in balsam, 1 slide.

12. *Gonatocerus californicus* species nova.

Normal position.

Female.—Length, 0.60 mm. Small for the genus.

Allied with *aureus* and its allies. Differing from *aureus* in that the second and third funicle joints of the antennae become lengthened and are longer than either the fourth or fifth, nearly twice longer than joint 1 of the funicle. Joints 2, 3, 4 and 5 of the funicle slender, each at least over twice its own width; excepting for general coloration, similar to *aureus*. It resembles *pygmaeus* somewhat in color scheme but the fringes of the fore wing at the cephalic margin are twice longer in this species and the antennae differ.

General color very dark brown, the base of the abdomen marked with golden orange; scape, pedicel, trochanters, knees and proximal four tarsal joints pallid. Legs and antennae brownish. Wings slightly, though distinctly, uniformly fumated. Venation dusky brownish.

Fore wings with the marginal vein moderate in length, about eight times longer than wide, the ciliation usual for the group of species to which it is allied, excepting that the marginal cilia along the cephalic margin of the fore wing are longer than usual, nearly equal to those of the caudal margin. Posterior wings very slender, bearing no discal cilia other than the paired line along each margin, their marginal cilia as long as those of the fore wing (but very short on cephalic margin).

Ovipositor not exerted; tarsal joints short; strigils present. Antennae with the second and third funicle joints subequal to or slightly longer than the pedicel; funicle joints 4 and 5 shorter, 6 somewhat shorter than 5, but either distinctly longer than the proximal funicle joint. Antennae normal.

From 1 specimen, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen remounted in xylol-balsam from a tag in the United States Museum collections, bearing the label "Siskiyou Co., Calif."

Habitat.—United States: California (Siskiyou Co.).

Type.—Type No. 23,822, United States National Museum, Washington, D. C., one female in balsam.

13. *Gonatocerus mævius* species nova.

Normal position.

Female.—Length, 0.85 mm. Moderately large for the genus.

Alited with and resembling *maximus* from which it may be distinguished by reason of the fact that here the proximal funicle joints are all short, more especially the third funicle joint is shorter than the fourth, the joints gradually enlarging distad; also the marginal vein of the fore wing is shorter and the posterior wing is almost densely ciliate at the apex distally. The fore wings also are somewhat narrower. Otherwise as in *maximus*. The tarsi are pallid and the base of the abdomen inclined slightly that way. Discal ciliation of the fore wing fine and dense. Fore wings practically hyaline. Distal two funicle joints rectangular, largest, twice the size of the second funicle joint but not much longer than the preceding joint.

From a single specimen, $\frac{5}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen from the collections of the Illinois State Laboratory of Natural History, Urbana, Illinois, collected by sweeping timothy and red clover, Normal, Illinois, May 10, 1884 (S. A. Forbes).

Habitat.—United States: Illinois (Normal).

Type.—Accession No. 1692, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam (remounted from a tag).

The table to North American species of *Gonatocerus* follows.

DIAGNOSTIC TABLE

of the North American species of *Gonatocerus* Nees—Males, Females.

I. Ovipositor not exerted. Species yellowish to brown through brownish-black to black. Fore wings variable, broad, moderate or comparatively narrow and without a fuscia.

A. Fore wings very broad, with from forty-five to fifty longitudinal lines of discal cilia across their widest blade portion; only about twice longer than broad.

1. Marginal vein long; posterior wing across distal end of venation distinctly broader than the length of the longest marginal cilia of fore wing; dark brown, the wings hyaline (male).
latipennis Girault.

B. Fore wings broad, with from twenty-five to thirty longitudinal lines of discal cilia across their widest portion; only about two and a half times longer than broad; marginal cilia of fore wing relatively short.

1. Posterior wings at apex of venation broadened, twice broader than the blade just before apex or broader than the longest marginal cilia of fore wing.

Marginal vein of fore wing very long, about twelve times longer than wide; proximal tarsal joint of caudal legs long; dark brown, legs dark; robust, second and third funicle joints distinctly longer than pedicel, each twice longer than wide.

dolichocerus Ashmead.

2. Posterior wings at apex of venation not distinctly broadened, narrower than, or only as wide as, the longest marginal cilia of fore wing.

Second and third funicle joints of antennae each twice longer than wide, each subequal to, or longer than, the pedicel; marginal vein of fore wing relatively shorter; dark brown, legs light yellow.

nigritarsis Ashmead.

Second and third funicle joints of antennae each shorter, the second only a half longer than wide, the third longer than the fourth but distinctly shorter than the pedicel; legs dark brown.

maximus Girault.

Second and third funicle joints still shorter, the third shorter than the fourth, the joints gradually enlarging distad, none larger than the pedicel; fore wings somewhat narrower, the marginal vein shorter.

maevius Girault.

C. Fore wings narrower, with only from about twenty to twenty-five longitudinal lines of discal cilia across the widest blade portion and about three longer than broad; marginal cilia longer. Funicle joints 2 and 3 of antennae only about one and a half times longer than broad, each distinctly shorter than the pedicel; posterior wing at apex of venation not broadened but normal.

1. Species black, unmarked, proximal funicle joints uneven
americanus Brues.
 2. Species brownish black to olivaceous; an oblique, longitudinal pale streak along each side of mesoscutum; marginal vein of fore wing seven or eight times longer than wide.
anthonomi Girault.
 3. Species brown-black; unmarked on thorax; marginal vein of fore wing only about five times longer than broad.
texasus Girault.
 4. Species pure brown, small; antennae slender.
brunneus Girault.
 5. Species pale cadmium yellow, the abdomen darker distad, the legs uniformly concolorous; joint 4 of funicle twice longer than wide, over half the length of joint 5.....**aureus** Girault.
 6. Species brown-black, the base of the abdomen yellow; third funicle joint of antennae nearly as long as the pedicel and distinctly longer than joints 1, 2, or 4. Small; marginal vein of fore wing shorter.....**pygmaeus** Girault.
- II. Valves of the ovipositor distinctly exerted for some length; fore wings comparatively narrow and slender, or only moderately broad, without a fascia. Species deep black, marked with pale cadmium yellow or pallid. Abdomen long, conic-ovate, body more slender, graceful.
1. Antennae slender, funicle joint 4 shorter respectively than either the one following or the one preceding; funicles 3 and 5 longest; posterior wing not wide across the apex of the venation, its marginal cilia long.
Species black, base of abdomen distinctly marked with pale cadmium yellow or pale yellow as is also the base of the valves of the ovipositor; fore wings more distinctly fumated than usual; antennal scape and pedicel varying to pallid; proximal tarsal joint of posterior legs short. Funicle joints 2 and 3 long, longer than pedicel, subequal.
rivalis Girault.
Species wholly black, only the legs marked with pallid; proximal tarsal joint of posterior leg longer. Fore wings only very slightly uniformly fumated. Funicle joints 2 and 3 unequal, the latter longer but hardly as long as the pedicel.
maga Girault.
- III. Valves of ovipositor not exerted. Fore wings with a fascia.
1. A short brown fascia across wing just before apex of marginal vein; second funicle joint of antennae longer than pedicel. Marginal vein long.....**fasciatus** Girault.
 2. A short, somewhat broader fascia across wing slightly beyond apex of marginal vein; second funicle joint shorter than the pedicel; marginal vein shorter.....**novifasciatus** Girault.

This table is based upon an examination of types or else the original specimens of all of the species. The species *dolichocerus* Ashmead and *nigritarsis* Ashmead (1887, pp. 192-193), were unrecognizable from their descriptions and I very nearly redescribed the former as new from other specimens of it before comparing them with the remounted original specimen. Both of them are very much alike but may be distinguished by means of the characters given in the preceding table of species. From the original specimen of *nigritarsis* I have taken the following additional descriptive notes, besides designating the specimen as type:

Brownish black, the legs nearly uniformly pallid lemon yellow, the posterior tibiae and the tarsi brown. The fore wings are broad having from twenty-five to thirty-two longitudinal lines of discal cilia and are about two and a half times longer than broad. The marginal vein is yellow, long, but not so long as in *dolichocerus* and its free distal end is shorter than in the latter species. The posterior wing is slender, not considerably broadened across the apex of its venation, bearing the paired lines of discal ciliation along each margin but with no mid-longitudinal discal ciliation excepting a short line of from three to five cilia at the apex. Its marginal cilia along the posterior margin are longer than the longest marginal cilia of the fore wing; its blade is distinctly narrower than that of *dolichocerus*. The antennae have the first and second funicle joints each distinctly shorter than the pedicel, taken together longer than it, the third funicle joint subequal in length to the pedicel or slightly shorter, the fourth joint slightly longer; funicle joints 5, 6 and 7 subequal, distinctly longer than 4, the distal funicle joint shorter, subequal to 4. The club is long. Scape broad, its bulb long, taken together as long as the club. Strigil of anterior legs present.

From 1 female, $\frac{1}{2}$ -inch objective, 1-inch optic, Bausch and Lomb.

The foregoing notes taken from the original specimen found in the collections of the United States National Museum on a tag labelled "*Gonatocerus nigritarsis* Ashm. Jacksonville, Fla." in Ashmead's hand. No number was connected with it.

Type.—Type No. 13,806, United States National Museum, Washington, D. C., one female in xylol-balsam (the original specimen remounted).

Oophilus Enock (1909, p. 458, pl. xv, figs. 1-6) = **Gonatocerus** Nees.

An examination made of a specimen of the type species of this genus shows that it is a *Gonatocerus* of somewhat peculiar habitus but no more so than that of *rivalis* Girault or *maga* Girault; moreover, it is wrongly described for the tarsi are not 4-jointed but 5-jointed. Mistaken in regard to tarsal structure, doubtless the author was thus misled. The species is exactly as described with the exception of the essential difference just noted and the following: The ovipositor is not very long, that is to say, is not exerted for any length, but the valves are exerted as in *rivalis* and *maga*, that is distinctly, but not to any great extent (not to a length equal to the whole or a half that of the abdomen, for instance), in reality not even for a fifth of the length of the abdomen. The wings are those typical for *Gonatocerus* and similar to those in the broader winged species—*dolichocerus* Ashmead for instance. The antennae are typical with the exception that the scape is minutely and densely serrated along its ventral edge (not the club as Enock states) as in some species of *Polynema* (*bifasciatipennis* Girault, *enockii* Girault, *howardii* Ashmead).* The species thus falls in the group containing *rivalis* and *maga* because of its shortly, though distinctly, exerted ovipositor and may be distinguished at once from either by its broad fore wings and longer distal funicle joints of the antennae. Like the two American species it is black in color, marked slightly with yellow or pallid and has their comparatively long, conic-ovate abdomen, which, however, is not yellow at base; only the antennal pedicel, the proximal three or four tarsal joints, the knees, trochanters and tips of the tibiae are yellowish. In the fore wing, the marginal vein is usual in length, not lengthened as in *dolichocerus*; these wings bear about forty longitudinal lines of discal cilia at the widest blade portion but they are distinctly narrower than those of *latipennis*, the discal ciliation denser. Both wings are hyaline.

* This serration occurs in the males of other species of *Gonatocerus*, some of the North American species, but I cannot give specific instances of it just at present. It also occurs in *Anaphes*.

The foregoing notes taken from a single specimen, a female, remounted in balsam from a tag and received from Mr. C. O. Waterhouse; the specimen was labelled "*Oophitus longicauda* Enoch. ♀. Richmond, Eng. 7. 9. 10. C. O. Waterhouse." The name of the species is now *Gonatocerus longicauda* (Enock).

Genus **ALAPTUS** Haliday.

1. "*Alaptus pallipes* Ashmead."

As was shown elsewhere, this species was generically lost. Its position is definitely fixed beyond, where it is placed with *Anaphes* and redescribed. It has been captured in Illinois.

Genus **LITUS** Haliday.

1. *Litus armatus* Ashmead.

Ashmead, 1887, p. 193.

An examination of the original specimen of this species shows that the tarsi are 4-jointed and that the insect has anaphine affinities. It is doubtless one of the common species of *Anagrus* but at present I am unable to place it.

In Ashmead's handwriting the specimen was simply labelled "*Litus armatus* Ashmead, Jacksonville, Fla. Type." and no number was attached to the specimen. It is quite as described but the wings are now missing.

Further examination of this specimen shows that it is an *Anagrus*. Furthermore, the species is common in Illinois and varies considerably in color. It is a very beautiful form and has characteristic wing shape and antennæ, and thus may be easily recognized.

In order that this recognition may be possible and easy in the future, I have made extensive descriptive notes beyond, describing at the same time a color variety of the species. These notes are taken from the specimens mentioned in the place intimated as having been captured in Illinois.

Subfamily MYMARINÆ.

Tribe Anaphini.

Genus **ANAPHES** Haliday.

The only difference between this genus and *Anagrus* Haliday, so far as I am able to see, is that described for the male

antennæ; the venation does not differ. As considered here, using the structure of the males, the species of *Anaphes* are usually black, of *Anagrus* yellow; in the former, the fore wings wider and less graceful. The two genera may have to be combined.

1. *Anaphes pallipes* (Ashmead).

Anaphes pallipes Ashmead, 1887, p. 193.

Anaphes pallipes Ashmead, Girault, 1908, p. 186; 1910, pp. 243-244.

Further careful examination of the original specimen of this species shows that it is undoubtedly a species of *Anaphes*, though I have never seen the species in Illinois;* the original specimen has one pair of wings missing and the distal antennal joints, but I believe the species can be recognized again. It is closely related to *iola* Girault† in being similar in general appearance and in having the fine discal ciliation of the fore wings but the legs are wholly pallid and the antennæ differ in regard to the relative shape and size of the joints. Although Ashmead states in the original description that the antennæ are 8-jointed, which would indicate its position to be in the genus *Anthemis* Howard, yet it so closely resembles an *Anaphes* that until other specimens of it are found I believe it best to leave it here.

Since writing the above I have an undoubted specimen of it from Illinois and so make the following notes. The species is correctly placed unless it should prove to be an *Anagrus*, a fact which cannot be known until the male is discovered.

Female.—Length, 0.50 mm. Small for the genus.

Similar to *iola* but smaller and with differently colored legs; the antennæ differ structurally in having the fourth funicle joint short and rounded-ovate, not more than a fourth longer than wide and distinctly shorter than either the preceding or following joint, subequal to joint 2 of the funicle; in *iola* this is not so—the fourth funicle joint is about twice longer than wide, cylindrical ovate, less distinctly shorter than either the preceding or following joint, distinctly longer and wider than funicle joint 2; in *iola* the funicle joints are decidedly longer

* See the next paragraph.

† Described beyond.

throughout than in this species. The two species also agree in the shape, discal ciliation and general appearance of the fore wings, the discal ciliation in both species being moderately fine and short, not coarser as in the other species; there are about from ten to twelve longitudinal lines in this species (a few more in *sole*). The naked, rectangular space on the fore wing out from the apex of the marginal vein and along the cephalic margin is about the same in both species and is longer than the marginal vein. The marginal cilia of the fore wings are long, but the longest are distinctly shorter than the greatest width of the fore wing but not a great deal shorter. The posterior wings are curved and without discal ciliation other than the paired lines along each edge. They are distinctly shorter than the fore wings; their longest marginal cilia slightly over twice the width of the blade of the posterior wings. Honklets three, very minute. Tibial spurs minute, single. Proximal tarsal joints short, subequal to any of the others but somewhat longer and stouter on the cephalic legs. Thorax long, ovipositor concealed, the valves forming an acute point to apex of abdomen. Legs and antennae dusky to pale. Black. Fore wings fuscated slightly out as far as the end of the venation.

From 2 specimens, $\frac{1}{2}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Redescribed from the remounted original specimen found in the collections of the United States National Museum, mounted on a tag and labelled "*Alaptus pallipes* Ashm. Type. Jacksonville, Florida." and from a single female specimen captured on the pane of a window in an old pig-sty on a farm at Centralia, Illinois, September 2, 1909.

Habitat.—United States: Centralia, Illinois and Jacksonville, Florida.

Type.—Type No. 13,807, United States National Museum, Washington, D. C., the original specimen in xylol-balsam.

Homotype.—Accession No. 44,225, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam.

The original specimen has the distal two antennal joints missing and all wings excepting one fore wing.

2. *Anaphes mellicornis* Ashmead. = *Amilus*
Ashmead, 1887, p. 194.

This species is wrongly placed as concerns family, because it is a true Proctotrypid; its habitus and essential structure

serve to place it at once. Also, its posterior wings are not Mymarid in structure; otherwise it agrees in general appearance with *Anaphes* and were it not for its essential structures could easily be mistaken for a member of that genus. For the present, I leave it unplaced. Its antennæ are but 8-jointed, its tarsi 5-jointed, other characters which preclude its position here.

3. *Anaphes gracilis* Howard.

Howard, 1891, p. 370, pl. xxiv, fig. G.

Elsewhere (Girault, 1911 *b*) I redescribed this species and recorded it from Illinois; its original specimen has never been found but the antennal structure is characteristic. The species may be an *Anagnus*, but until the male is known it had better be left with this genus. Ashmead (1887, p. 194) gives the habitat of this species as California but that is a mistake and Smith (1910) records it from New Jersey, it is evident not from actual specimens. However, the species should occur in New Jersey at least. In Girault (1911 *b*), a typographical error occurs in giving the accession number of a specimen of this species in the collections of the Illinois State Laboratory of Natural History; its number is 44,221 and not 42,221; also the specimen was captured in 1909. Its type number in the United States National Museum is 2620.

4. *Anaphes sinipennis* species nova.

Normal position.

Female.—Length, 0.60 mm. With nearly the habits of *Camptoptera* Foerster. Moderately small to small for the genus. Characterized by deep black color and curved, rather narrow fore wings and a strange, foreign aspect for the genus (Cf. its structural details).

General color uniformly, deep black, the antennæ and legs lighter, smoky or dusky black, the scapo and pedicel suffused slightly with yellowish; resembling somewhat *Anaphoides pulliatus* Girault. Fore wings distinctly uniformly but not pronouncedly fuscated (dusky) but clear under the proximal half of the marginal vein and with a line of minute white dots along each edge. Posterior wings similarly fuscated throughout and with a row of small clear dots along the posterior edge of the blade. Venation dusky. Eyes and ocelli inconspicuous.

Fore wings narrow for the genus and curved as in the genus *Camptoptera* Foerster, nearly, the caudal margin concave, cephalic margin

broadly convex; their greatest width is at the distal three-fourths and is narrower than the length of the longest marginal cilia; the discal ciliation is coarse but uniform and is arranged only in about from five to seven longitudinal lines; along each margin very fine and short cilia are interspersed between the long, primary marginal ciliation; proximad, the discal ciliation of the fore wing is limited by an oblique line of cilia as in *Anaphroidea* which crosses the wing caudo-distad from about a point at the proximal two-thirds of the marginal vein. Proximad of this line, the wing is naked excepting for the presence of a single, distinct seta, centrally situated at the base of the marginal vein. Marginal cilia of the fore wing where longest (disto-caudad) one and a half times longer than greatest width of the blade, slightly longer than the longest cilia of the posterior wing and about sixty around the whole blade. Marginal vein long, about four and a half times longer than broad, its distal end free, concave, ending in an obtuse point projected disto-cephalad. Fore wings ending in an obtuse point. Posterior wings narrow, curved slightly in a direction opposite to that of the fore wings, the cephalic margin broadly concave; acuminate, subacute at apex; its caudal marginal cilia long, much longer than the greatest width of the fore wing, at least four times longer than the average width of the blade of the posterior wing, those of the cephalic margin short, yet longer than the greatest width of the blade. Its discal ciliation consisting only of the *paired lines along each edge*, absent in the disk; two small hooklets. Marginal vein of fore wing bearing rather numerous setae, irregularly placed (about nine to ten).

Thorax much larger (about twice) than the abdomen, the latter sessile, small, ovate, the valves of the ovipositor not conspicuous. Legs with the cephalic tibiae short, slightly shorter than the cephalic femora, the intermediate and caudal tibiae slender, distinctly longer than their respective femora. Tarsi 4-jointed, the proximal joints short, the others shortening distad but the proximal joint in the cephalic tarsi is twice larger than the second joint of those tarsi and bears a strigil; tibial spurs of cephalic tibiae single, curved, comparatively large, forked at tip; those of the other legs *paired (?) and extremely minute*, apparently absent.

Antennae 9-jointed, with a solid club. Scape somewhat longer than the pedicel and first two funicle joints combined; pedicel obconic, very much larger than the proximal funicle joint and longer than all funicle joints excepting the second, third and sixth, to either of which it is subequal in length; funicle joints 1, 2 and 3 slender, 4 and 5 and 6 thickening distad; 1 minute, barely longer than wide; 2 longest, slender, three and a half times longer than 1; 3 slightly shorter and very slightly thicker; 4 still shorter, thicker, cylindrical ovate; 5 slightly longer and thicker and 6 widest, longer, as long as joint 3 or even 2 (2 and 3 sometimes equal); 6 still narrower than the pedicel; club

abruptly larger, nearly twice wider than the pedicel, ovate, with longitudinal grooves and as long as the combined lengths of the three proximal funicle joints. Along the whole of one side are grouped white dots, apparently setigenous spots, and in other aspects seen to be minute stiff setæ. Pubescence rather long, soft hairs on funicle, very short on club and closer.

From 3 specimens, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from two female specimens captured by sweeping grass, Urbana, Illinois, July 1, 1910, and a third on a stable window at Litchfield, Illinois, July 23, 1910.

Habitat.—United States: Urbana and Litchfield, Illinois.

Types.—Accession No. 44,224, Illinois State Laboratory of Natural History, Urbana, Illinois, two females in xylol-balsam (1 slide carrying miscellaneous mymarids). Type locality, Urbana, Illinois.

5. *Anaphes nigrellus* species nova.

Normal position.

Female.—Length, 0.75 mm. Moderately small but robust, short and stout. Fore wings moderate in width, not curved.

General color Van Dyke brown to blackish; the antennae and legs dull olivaceous, the trochanters and knees pallid; the eyes very dark; wings fumated as in *sinipennis*; coxæ exteriorly somewhat darker.

Fore wings not curved, moderate in width, their greatest width subequal to their longest marginal cilia, their discal ciliation moderately fine and dense, arranged in from ten to twelve longitudinal lines across the widest blade portion and limited proximad as in the former species. Marginal vein as in the former species; distad just before apex, caudal margin of fore wing nearly straight, the cephalic margin convex. About sixty-five marginal cilia. Posterior wings as in *sinipennis* but slightly more curved and wider, bearing the usual paired line of discal ciliation along the caudal edge of the wing but that of the cephalic edge is single after it reaches half-way to the venation; its longest marginal cilia are subequal in length to the longest of the fore wings or slightly shorter, and they are about three times longer than the average width of the blade. Posterior wings nearly as long as the cephalic ones. The secondary marginal ciliation present in the fore wings. In the midlongitudinal line of the posterior wing is a line of from four to ten discal cilia running from the apex.

Abdomen globose-ovate, smaller than the thorax, sessile, the valves of the ovipositor not at all prominent or exerted. Tibial spurs minute, single (?), those of the cephalic legs larger, two-tined at tip and form-

ing the usual strigil; the four basal joints about equal but in the cephalic furci, the proximal joint is distinctly longer than the others but none are long, though all longer than wide.

Antennae moderately densely pubescent, 9-jointed, the club solid; scape usual, moderately long; pedicel obconic, shorter than any of the funicle joints excepting the first which is usual and minute, quadrate; funicle filiform or nearly, very slight enlargement distad, the five distal joints cylindrical, moderately long, the second shortest, three or more times longer than the first, a fifth shorter than the third and somewhat narrower; joints 3, 4, 5 and 6 of the funicle subequal in length and width, slightly shortening distad, 3 and 4 slightly the longest funicle joints. Club not very broad, long ovate, slightly longer than the combined lengths of the two preceding joints.

From 1 specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Described from a single female specimen which flew into a snail laboratory dish of xylol on a table in the Natural History Building, University of Illinois, Urbana, Illinois, June 26, 1909, and which was captured and mounted by Mr. J. D. Hood to whom the author is indebted for the specimen. Also subsequently another female captured in a greenhouse at Urbana, October 19, 1910. This specimen is decidedly darker all over, colored like *sinipennis* and the wings are more deeply fumated but otherwise I can not distinguish between them. A third female has been captured, together with *sinipennis* on a stable window, July 13, 1910, Litchfield, Illinois.

Habitat.—United States: Urbana, Litchfield and Chicago, Illinois.

Type.—Accession No. 44,223, Illinois State Laboratory of Natural History, Urbana, Illinois. 1 female in xylol-balsam, Urbana. *Coltype*.—Cat. No. 13,808, United States National Museum, Washington, D. C., 1 ♀ similarly mounted, same locality.

Amongst some miscellaneous Hymenoptera turned over to me for identification by a member of the Department of Biology of the University of Chicago, I have found an undoubted specimen of a male of this species in a vial of alcohol labelled "University of Chicago. Allen. 554": within the vial was a label as follows: "Geo. D. Allen. 8. 10. 09.

Stony Is. 554." The male is similar to the female with the exception of the secondary sexual characters. The antennae are normal, 12-jointed, the first funicle joint is twice the length of the pedicel, subequal to the distal joint; other flagellar joints a fourth or more longer than the first or last one, moderately long and slender, longitudinally striated.

6. *Anaphesiole* species nova.

Normal position.

Female.—Length, 0.75 mm. Moderately small for the genus.

Differing from the species of the type of *nigellus* in having a longer, more slender thorax, hence a more slender body and in having the fore wings broader, with less curvature in either margin, the apex more rounded and the discal ciliation finer, not as long or coarse. The body hence like that of *gracilis* and *pallipes*, less hump-backed than with *simpennis* and *nigellus*, the fore wings also less fumated, more clear. The species like *pallipes* Ashmead, excepting as has been or will be noted.

General color black, suffused with some brownish; end of the marginal vein, the pedicel in places, the trochanters, tips of femora and tibiae pallid, the rest of the legs, venation and antennae dusky. Fore wings clear, excepting all that portion proximad of the venation. Posterior wings hyaline.

Thorax long, the abdomen shorter, but conic-ovate, sessile, the ovipositor not exerted. Legs as in the preceding species. Mandibles with three weakly indicated sinuations.

Fore wings as in *pallipes* but slightly broader (about fourteen longitudinal lines of discal cilia at the widest blade portion), the longest marginal cilia subequal to but slightly shorter than the greatest wing width. Posterior wings, a single line cephalad, a paired line caudad of discal ciliation, the latter apart some distance and in the disk a line containing about four cilia each far apart from the other in the line, and the first some distance proximad from the wing apex. Longest marginal cilia of the posterior wings slightly shorter than those of the fore wing. In the fore wing, discal ciliation absent proximad of the usual oblique limiting line running out from the marginal vein. Marginal vein distinctly shorter than the naked area just distad of it but about four and a half times longer than wide.

Antennae 9-jointed, normal. Pedicel six or seven times larger than the small subquadrate proximal funicle joint, subequal to or slightly longer than joint 2 of the funicle, but very much broader, obconic; second funicle joint next shortest of the funicle, two and a half or three times longer than joint one, slender yet widening somewhat distad; funicle joint 3 longest of the funicle, a third longer than 2 and distinctly not so slender; 4 and 5 subequal, cylindrical ovate, broader, a

fifth shorter than 3; 6 still somewhat shorter and broader, yet still longer than 2; club solid, moderately short, only as long as the two preceding joints and not much broader, ovate. Pubescence light, scattered, but more or less in whorls. Scape thickened ventrad, moderate in length.

From 1 specimen, $\frac{3}{4}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen mounted in balsam and captured at Urbana, Illinois, on greenhouse windows, April 30, 1910 (A. A. Girault).

Habitat.—United States: Urbana, Illinois.

Type.—Accession No. 44,241, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam.

7. *Anaphes hercules* species nova.

Normal position.

Female.—Length, 0.93 mm. Large for the genus.

This is the largest species yet seen from North America but is not large as a mymarid. It is similar to *nigrellus* but differs as follows: The fore wings are broader, bearing about fifteen longitudinal lines of discal ciliation at their widest blade portion, the marginal vein is comparatively very long, longer for instance than the naked area distad of it, the posterior wings bear along their midlongitudinal line two lines of discal cilia of about from six to ten cilia each, running from the apex but unequal and they are somewhat more acute at apex. Otherwise, they are alike. The posterior wings are barely shorter than the fore wings.

From 1 specimen, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen captured on the glass sides of a greenhouse at Urbana, Illinois, June 8, 1910 (A. A. Girault).

Habitat.—United States: Urbana, Illinois.

Type.—Accession No. 44,242, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam (mounted with a female of *Polynema consobrinus* Girault and a *Gonatocerus*).

8. *Anaphes cinetiventris* species nova.

Normal position.

Female.—Length, 0.80 mm. Moderate in size for the genus.

Allied with and resembling *Anaphes gracilis* Howard but differing as follows: Larger, the antennal joints all of the same shape but longer, the wings are decidedly longer and broader, their discal ciliation sparse and absent proximad as in *gracilis* but there are about from thirteen to fifteen longitudinal lines, instead of about from ten to eleven; it differs more especially in having the funicle joints of the antennae less quadrate, for instance the distal funicle joint is over twice longer than its greatest width (at apex); in *gracilis* it is hardly more than one and a half times longer; the penultimate funicle joint in this species is distinctly longer than wide, but in *gracilis* it is about as wide as long or subquadrate at least. Colorationally this species differs from the other in having the legs and antennae decidedly darker, only the trochanters, knees, second and third tarsal joints pallid; the tarsal joints are all decidedly longer, especially the proximal joint. The antennal scape is very long, nearly a half longer than with *gracilis* and nearly as long as the funicle.

General color black, the base of the abdomen yellow. Second and third tarsal joints, knees and trochanters pallid, suffused with more or less dusky, the distal tarsal joints pallid dusky, the proximal tarsal joints brown or concolorous with the legs, but those of the cephalic and intermediate legs are paler. Antennae concolorous, uniform in color. Fore wings fumated only proximad, across the venation. Venation pallid.

Thorax long and slender, longer than the abdomen; the latter sessile, the ovipositor not exerted. Otherwise as in *gracilis*.

From 1 specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen in the U. S. National Museum collection on a tag labelled "E. H. Ehrhorn. Mtn. View, Calif. 6639. Iss. 27 June, '95". Remounted in xylol-balsam.

Habitat.—United States: California (Mountain View).

Type.—Type No. 13,809, United States National Museum, Washington, D. C., one female in xylol-balsam.

This species is closely allied with (*pyrrhmalus*) *Anagrus goochi* Enock, recently (Enock, 1909, pp. 454-455, pl. XIII, figs. 6-10) described from England (Wales) but through the great kindness of Mr. C. O. Waterhouse I have been able to

fused with *Anaphes nigrellus* described in this paper if attention is not given to the structure of the antennal club.

Genus **ANAGRUS** Haliday.

1. *Anagrus armatus* (Ashmead).

Litus armatus Ashmead, 1887, p. 193.

Eustochus xanthothorax Ashmead, *ibid.*, pp. 193-194.

Anagrus columbi Perkins, 1905, p. 198, pls. XII, fig. 4; XIII, fig. 8 a.

Normal position.

Female.—Length, 0.50 mm., average, somewhat variable. Moderate in size for the genus.

General color gamboge but variable somewhat in shadings; bright, uniform. Body shaded with dusky above on thorax and abdomen; sometimes pallid yellow and thus shaded and sometimes with some orange. Legs and antennae concolorous or the flagellum may be dusky (except proximal funicle joint; that, the scape and pedicel pallid yellow); valves of ovipositor dusky. Ovipositor itself concolorous. Eyes dark reddish. Mouth fuscous. The abdomen may be wholly dusky and with a faint striped appearance due to the pale intersegmental spaces. Wings hyaline, excepting a slight fuscation proximad.

Fore wings as in *Polynema longipes* (Ashmead), that is very narrow and graceful with very long marginal cilia; fore wing curved, clavate, narrow proximad, very gradually, uniformly enlarging distad, then more rapidly enlarging to a pear-shaped apical head, its discal ciliation sparse, only about five or six longitudinal lines just before apex, the central one of which is longer, extending proximad nearly to the base of the marginal vein; the individual cilia are moderate in size, not short nor minute. The apex of the fore wing is bluntly conical. The longest marginal cilia of the fore wing are one and three-quarters longer than the greatest wing width, somewhat unusual for the genus; they are distinctly longer than the longest cilia of the posterior wings. Marginal vein of fore wing moderate in length about six or seven times longer than wide and free and curved distad. Posterior wings very narrow and slender, nearly as long as the fore wings (reaching out to widest point of the fore wing), slightly curved, acuminate, acute at apex, without discal cilia excepting for a paired row along each margin, each line somewhat separated. Hooklets three in number. Marginal cilia of the caudal margin of the posterior wings very long, about three and a half times longer than the wing blade is wide but as stated shorter than the longest cilia of the fore wing.

Parapsidal furrows complete, the mesoscutum subquadrate. Abdomen scabrous, short, conic-ovate, the valves of the ovipositor distinctly slightly exerted (not long exerted as stated in the original description of this species, but only exerted to the length of the second funicle

11. Fore wings densely ciliate, the discal cilia extending uniformly proximad beneath the venation and limited there by a distinct oblique line of cilia which runs caudo-distad from a point near the base of the marginal vein; funicle joints of antennae longer, cylindrical to cylindrical ovate, joints 2 and 3 longest, as long as or longer than the pedicel, the joints not successively enlarging distad. Species usually wholly black, the fore and posterior wings usually fumated.

1. Fore wings slender and curved, the marginal cilia distinctly longer than their width (nearly twice longer), the discal cilia arranged only in about six or seven lines.

Wholly black; fore wings fumated with the exception of a rectangular clear area under the marginal vein proximad; funicle joints 2 and 3 subequal, slender, about as long as the pedicel or somewhat longer.....**sinipennis** Girault.

2. Fore wings broader, not curved, the marginal cilia not any longer than the greatest wing width, the discal cilia arranged in more than six or seven lines.

Fourth funicle joint of antennae not much longer than wide, not much more than a half as long as the third.

Proximal tarsal joints short; third funicle joint cylindrical-ovate, longest; black, legs and antennae dusky yellowish.

pallipes Ashmead.

Fourth funicle joint of antennae twice longer than wide, at least two-thirds the length of the third or subequal to it.

Third funicle joint cylindrical, longest, a fourth longer than the fourth joint; blade of the fore wing mostly hyaline, the cilia fine. Posterior wings hyaline, without a distinct row of white dots along the caudal margin....**fole** Girault.

Third funicle joint cylindrical but scarcely longer than any of the following funicle joints; fore wings clouded throughout, the discal ciliation more distinct; posterior wing fumated, with a distinct row of white dots along the caudal margin.

Fore wing with the marginal vein shorter than the naked area distad of it; fore wings with 12 lines of cilia.

nigrellus Girault.

Fore wing with the marginal vein longer than the naked area distad of it; fore wings with about 15 lines of cilia.

hercules Girault.

Genus **ANAPHOIDEA** Girault.

1. **Anaphoidea pullerura** Girault.

I have captured a female of this species at Litchfield, Ill., July 13, 1910, on stable windows. It may easily be con-

fused with *Anaphes nigrellus* described in this paper if attention is not given to the structure of the antennal club.

Genus **ANAGRUS** Haliday.

1. *Anagrus armatus* (Ashmead).

Litus armatus Ashmead, 1887, p. 193.

Eustochus xanthothorax Ashmead, *ibid.*, pp. 193-194.

Anagrus columbi Perkins, 1905, p. 198, pls. XII, fig. 4; XIII, fig. 8 a.

Normal position.

Female.—Length, 0.50 mm., average, somewhat variable. Moderate in size for the genus.

General color gamboge but variable somewhat in shadings; bright, uniform. Body shaded with dusky above on thorax and abdomen; sometimes pallid yellow and thus shaded and sometimes with some orange. Legs and antennae concolorous or the flagellum may be dusky (except proximal funicle joint; that, the scape and pedicel pallid yellow); valves of ovipositor dusky. Ovipositor itself concolorous. Eyes dark reddish. Mouth fuscous. The abdomen may be wholly dusky and with a faint striped appearance due to the pale intersegmental spaces. Wings hyaline, excepting a slight fuscation proximad.

Fore wings as in *Polynema longipes* (Ashmead), that is very narrow and graceful with very long marginal cilia; fore wing curved, clavate, narrow proximad, very gradually, uniformly enlarging distad, then more rapidly enlarging to a pear-shaped apical head, its discal ciliation sparse, only about five or six longitudinal lines just before apex, the central one of which is longer, extending proximad nearly to the base of the marginal vein; the individual cilia are moderate in size, not short nor minute. The apex of the fore wing is bluntly conical. The longest marginal cilia of the fore wing are one and three-quarters longer than the greatest wing width, somewhat unusual for the genus; they are distinctly longer than the longest cilia of the posterior wings. Marginal vein of fore wing moderate in length about six or seven times longer than wide and free and curved distad. Posterior wings very narrow and slender, nearly as long as the fore wings (reaching out to widest point of the fore wing), slightly curved, acuminate, acute at apex, without discal cilia excepting for a paired row along each margin, each line somewhat separated. Hooklets three in number. Marginal cilia of the caudal margin of the posterior wings very long, about three and a half times longer than the wing blade is wide but as stated shorter than the longest cilia of the fore wing.

Parapsidal furrows complete, the mesoscutum subquadrate. Abdomen scabrous, short, conic-ovate, the valves of the ovipositor distinctly slightly exerted (not long exerted as stated in the original description of this species, but only exerted to the length of the second funicle

joint for instance, not more than a fourth or fifth of the length of the abdomen). Tarsi 4-jointed, the joints subequal, the proximal joint in the cephalic legs, however, somewhat longer than the others of the same tarsus. Strigil present on cephalic legs.

Antennæ normal for the genus, 9-jointed. Scape moderate in length, as long as the next three joints combined. Pedicel usual, shorter than second funicle joint, longer than the first. Proximal funicle joint subquadrate, yet somewhat longer than wide, small, only a fourth the length of the second funicle joint and a third that of the pedicel; second funicle joint longest of funicle, slender, a third longer than the pedicel, a fourth longer than funicle joint 3, which is still slender but yet slightly enlarged distad; next three joints subequal in length, broader, cylindrical ovate, each subequal in length to funicle joint 3, each a little stouter than the one preceding but not very stout. Club ovate, solid, slightly longer than the two joints preceding when combined. Pubescence inconspicuous, consisting of sparse, scattered setæ.

From 9 specimens, $\frac{3}{8}$ -inch objective, 1-inch optic. Bausch and Lomb.

Male.—The same but somewhat shorter, abdomen shorter than the thorax and bluntly triangular. The antennæ are 13-jointed, filiform, the proximal funicle joint shortest, longer than wide, subequal in length to the pedicel, the other funicle joints about a fourth longer, gradually lengthening somewhat distad and subequal in width; the distal funicle joint is twice the length of the proximal one and about a fourth or more longer than the second funicle joint; club joint conical, slightly shorter than the distal funicle joint.

From 1 specimen, the same objective and optic.

Redescribed at first from one male and nine female specimens captured on windows and by sweeping as follows: One female taken on the window pane of a shed on a farm at Centralia, Illinois, August, 1909; one female (and three of the variety *nigritiventris*) taken together on the glass sides of a greenhouse at Urbana, Illinois, April 30, 1910; one male and three females taken together on a greenhouse window, Urbana, May 16, 1910; three females taken by sweeping blue grass and clover at Urbana, June 8, 1910; and a single female captured along the edges of a cypress swamp by sweeping, May 14, 1910 (C. A. Hart and A. A. Grault).

Habitat.—United States: Urbana, Pulaski, Butler, Bloomington and Centralia, Illinois; Jacksonville, Florida; Columbus, Ohio; Annapolis, Maryland.

Anagrus armatus nigriventris, varietas nova.

Female.—The same as the typical form, differing in having the whole abdomen very dark, nearly black, its tip somewhat lighter and in having the thorax bright yellow; the pronotum is also darker and the head; sometimes just the middle of the thorax remains yellow; the base of the fore wings, across the marginal vein is distinctly fumated; the legs and antennae remain, however, unaltered.

Male.—Unknown.

This variety, uniquely colored, appears like an entirely different species when viewed casually. Described from ten females captured as follows: Four females captured at Centralia, Illinois, August 25, 1909, on the panes of a window; two others taken from the window of a greenhouse on the campus of the University of Illinois at Urbana, April 30, 1910; and the four remaining specimens captured in the same greenhouse May 2 (one female), October 19 (three females), 1910. With the latter was a single female of the typical form.

Type.—Type No. 13,810, United States National Museum, Washington, D. C., one female in xylol-balsam (wings missing; the original Ashmeadian specimen).

Homotypes.—Accession No. 44,219, Illinois State Laboratory of Natural History, Urbana, one female in xylol-balsam (Centralia, Illinois, August 29).

Type of the variety nigriventris: Accession No. 44,220, Illinois State Laboratory of Natural History, Urbana, two females in xylol-balsam, 2 slides (Centralia, Illinois, August 25).

While not being able to compare the types of *Anagrus columbi* Perkins, the description of that species leaves little doubt but that it is identical with this species. Therefore, I have given it above as a synonym. As shown elsewhere, *Eustochus xanthothorax* Ashmead is also a synonym of this species. *Anagrus armatus* must be exceedingly common throughout the United States.

I have also the following specimens of the typical form: Centralia, Illinois, on windows, two females (August 27 and 29, 1909); Urbana, in sweepings, one female (May 25, 1910). And of the variety *nigriventris*, six females captured in a

greenhouse at Urbana, May 23, 1910; one female at Centralia on a window, August 27, 1909, and one male and one female at Butler, Illinois, in a dead artificial cedar forest (sweeping weeds), July 14, 1911; also one male and five females taken in a greenhouse at Annapolis, Maryland, August 25, 1910 (A. A. Girault). Also I have observed females of this species crawling over the panes of a window of a flour mill at Bloomington, Illinois, October, 1909.

2. *Anagrus epoe* species nova.

Normal position.

Female.—Length, 0.35 mm. Very small for the genus, not easily visible to the naked eye; about the size of the larger females of *Campoplex pulla* Girault but less easily seen.

Similar to the typical form of *armatus* Ashmead but slighter and differing in the following structural details: The second and third funicle joints of the antennae are shorter, the third is somewhat longer than the second, as much longer as the second is longer than the third in *armatus*—thus in this species the second funicle joint is only about two and one-half times longer than wide; whereas in *armatus* it is about five or more times longer than wide; furthermore, while with this species the distal funicle joint is distinctly longer than the second joint of the funicle, in *armatus* it is distinctly shorter; it is broader in both. The fore wings differ—in this species they have finer marginal ciliation somewhat as in *spiritalis* and the discal ciliation is somewhat as in *frequens* Perkins, in that a more or less distinct naked area, elliptical in shape, is left near the caudal wing margin just proximal of the apex; only three principal lines of the discal cilia are prominent, the central or third one long, as long as in *armatus*; at the apex, a part (several cilia) of a fourth line is present between the second and third; and a fifth near the caudal margin.

General color gamboge, unmarked, sometimes the base of the abdomen dorsad at base dusky or the whole of the dorsum may be dusky (rarer, the head, pronotum and whole abdomen dusky, the wings then more pronouncedly fumated). Eyes dark red; ocelli ruby red. Legs and antennae concolorous, only the club of the latter dusky, usually. Fore wings variable, distinctly fumated sometimes across the venation, usually hyaline. Posterior wings without midlongitudinal discal ciliation, as in *armatus*. Ovipositor exerted as in *armatus*. Parapsidal furrows complete.

Antennae 8-jointed; first funicle joint minute, second about three and one-half times longer, remaining joints lengthening and widening distad.

From 9 specimens, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—The same as the female but slightly smaller, the abdomen more blunt at apex. Antennae 13-jointed; first funicle joint globular, slightly smaller than the pedicel; other joints as in *armatus* but decidedly shorter, only a little over twice longer than wide, in *armatus* about thrice so.

From a single specimen, $\frac{3}{4}$ -inch objective, 1-inch optic, Rausch and Lomb.

Described from one male and nine female specimens captured: at Centralia, Illinois, on a window, August 25 (one female), September 2 and 4, 1909 (one male, six females); and at Urbana, one female on May 5 and one on October 8, 1910, in a greenhouse.

In the U. S. National Museum collections I have since found two males and one female of this species labelled "471^{ms}. Iss. Sep. 28, '83", but with no other data.

Habitat.—United States: Centralia and Urbana, Illinois.

Type.—Accession No. 44,222, Illinois State Laboratory of Natural History, Urbana, Illinois, one male, five females in xylol-balsam, 1 slide (Centralia, Sept. 4).

Cotype.—Cat. No. 13,811, United States National Museum, Washington, D. C., one female in xylol-balsam (Centralia, Illinois, August 25, 1909; mounted with a female of *Campoplex pulla* Girault).

3. *Anagnus puella* species nova.

Normal position.

Female.—Length, 0.75 mm. Moderately large for the genus and longer than the preceding species (*armatus*, *epos*).

The same as *armatus* Ashmead in general structure but differing at once in having the fore wings distinctly broader, there being about ten longitudinal lines of discal cilia at the widest blade portion (only about five or six in *armatus*). The posterior wings are also broader in proportion. Also larger, longer.

General color gamboge to luteus, wholly suffused with dusky, hence dark; legs and antennae concolorous, excepting pedicel and first funicle joint which are pallid. Wings hyaline but proximad more or less fumated. Abdomen longer than the head and thorax combined, conic-ovate, pointed, the valves of the ovipositor exerted as in *armatus*. Fore wings with the discal ciliation arranged in from about nine to eleven longitudinal lines at the greatest wing width, irregular, moderate in density, rather coarse and with the marginal cilia long and moderately fine, the longest about one and a quarter times longer than

the greatest wing width. Posterior wings with the discal ciliation arranged as with the preceding species, but in the midlongitudinal line at apex there may be a short line of two or three discal cilia. Parapsidal furrows complete. Valves of the ovipositor exerted as in the other species. Also the phragma is present.

Antennae 9-jointed; the second funicle joint is longest, the proximal joint very short; the distal four funicle joints wider and very gradually shortening.

From 2 specimens, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—The same, lighter in color, the abdomen dusky. Scape, pedicel and first funicle joint pale, pallid yellow.

Antennae 13-jointed, the flagellar joints longitudinally striate, the proximal funicle joint slightly shorter than the pedicel or subequal to it, longer than wide, a fourth shorter than the second funicle joint and the club joint. Remaining funicle joints subequal, gradually lengthening distad but the club joint is shorter again and conical, narrower.

From one specimen, the same magnification.

Described from two female specimens captured by sweeping along the edges of a cypress swamp at Pulaski, Illinois, May 14, 1910 (C. A. Hart and A. A. Girault), and a single male specimen received from Prof. T. D. A. Cockerell and collected at Boulder, Colorado, August 5, 1910.

Habitat.—United States: Pulaski, Illinois and Boulder, Colorado.

Types.—Accession No. 44,228, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xyfol-balsam (2 slides as noted above).

4. *Anagrus* in species nova.

Normal position.

Male.—Length, 0.80 mm. Long and slender for the genus, especially slender at the thorax. With the general appearance of *Anagrus gracilis* Howard. Distinguished by its broad fore wings, without discal ciliation on the proximal half of the blade.

General color black, the base of the abdomen pallid yellowish, the scutellum suffused with yellowish but not conspicuously yellow like the base of the abdomen, all of each leg uniformly lemon yellow but the posterior legs are dusky on the femora and tibiae; whole of the antennae dusky lemon yellow. Venation dusky yellowish. Wings hyaline but proximal suffused with fuscous out as far as the end of the venation. Distal tarsal joint not darker.

Fore wings broad for the genus, distinctly broader than those of any

of the preceding species and less paddle-shaped, at their widest point bearing about fourteen longitudinal lines of discal ciliation which has a soft appearance, is moderately fine and not dense nor sparse either; proximad, about half-way from the wing apex to the apex of the venation it abruptly disappears, the surface of the wing then naked with the exception of a single, minute, isolated seta located nearly centrally in the wing opposite the base of the marginal vein. Marginal cilia of the fore wing very fine and long, the longest about one and a quarter times longer than the greatest wing width and slightly longer than the longest marginal cilia of the posterior wings; the latter with the normal discal ciliation, namely only the paired lines along each edge; moderate in width, its longest marginal cilia four or more times longer than the mean width of the blade. Posterior wings reaching nearly to the apex of the fore wings.

Thorax long and slender, nearly twice the length of the small, ovate abdomen; the latter sessile, the genitalia exerted, long and curved, subequal to the abdomen in length. Legs with the proximal tarsal joints moderately long, longer than the other three tarsal joints taken separately, the joints shortening distad; tibial spurs single, usual, the strigill present on the cephalic tibiae.

Antennae 13-jointed, filiform, all of the flagellar joints distinctly longitudinally striate, all of the funicle joints spinny or acute at their distolateral angles; scape not long; pedicel short and stout; first funicle joint distinctly longer than the pedicel; second and following joints to tenth, subequal, each very slightly longer than the proximal funicle joint, about three and one-half times longer than wide, slender, cylindrical; the club joint a fifth shorter, obtusely conical. Pubescence not noticeable.

From 1 specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Female.—Unknown.

Described from a single male specimen captured by sweeping miscellaneous vegetation (mostly in meadows) at Urbana, Illinois, May 25, 1910.

Habitat.—United States: Urbana, Illinois; Los Angeles County, California.

Type.—Accession No. 44,243, Illinois State Laboratory of Natural History, Urbana, Illinois, one male in xylol-balsam (Urbana, Illinois. Mounted with two male *Gonatocerus*).

I have since found another male of this species mounted on a tag in the National Museum Collection labelled "7302. April 11 '86. Los Angeles Co., Cal.". This was remounted

in xylol-balsam. It differed from the Illinois specimen in having a more or less obscure fuscous cloud crossing the fore wing about midway between the distal end of the marginal vein and the wing apex.

5. *Anagnus saga* species nova.

Normal position.

Female.—Length, 0.55 mm. Moderate in size for the genus.

Differing at once from all other species of the genus by being wholly black in color, in having the body of the abdomen narrowed at the base as in petiolate genera and having the antennal joints all short, none of them longer than the pedicel. The fore wings though narrow are densely ciliate, the cilia fine.

General color dusky black, the legs and antennae dusky; portions of coxae, knees, tips of tibiae, trochanters and proximal three tarsal joints pallid, the distal tarsal joint dusky; wings hyaline, venation pallid dusky. Eyes garnet.

Fore wings normal to the genus, their caudal margins straight, the cephalic margins convexly curved, the dilatation near base caudal prominent, the wings somewhat as in *puella* but narrower, distinctly broader than in *armatus* or *spes*; discal and marginal cilia fine, the latter distinctly longer than the greatest wing width, the longest being about a fourth longer; the discal short and fine, distributed uniformly, about twelve longitudinal lines across the widest portion of the blade. Posterior wings narrow, straight, the marginal fringes of the caudal margin five or more times longer than the width of the wing blade, not more than two-thirds the length of the longest marginal cilia of the fore wing, those of the cephalic margin short, just slightly longer than the wing blade is wide. Discal cilia of posterior wings distinct and apparently normal, there being no well thought longitudinal line of them. Legs rather less slender than usual, the coxae all obconic and short, the femora short and obclavate, the posterior tibiae slenderer and longer than the others, distinctly longer than the caudal femora, the cephalic femora and tibiae subequal in length, the latter curved, the former obclavate; tibial spurs single, short, small, the cephalic one forming a strigil, curved and forked but yet small; joints of cephalic tarsi short, the proximal joint there thick and short, yet twice the size of either of the following joints; the proximal joint of the caudal tarsi moderately long, slender, a third longer than the corresponding joint of the cephalic tarsi and twice the length of the same joint of the intermediate tarsi. Parapsidal furrows complete, widely separated; abdomen short, ovate, the ovipositor not at all exerted, proximal the abdomen narrowed as if petiolate, about equal to the thorax in length. Vertexal carina present, separating the lateral ocelli from the eye margins.

Antennae 9-jointed, the joints all short. Scape and pedicel nearly

equal in size and shape, hence the former shorter than usual; it is, however, somewhat larger than the pedicel, and conic, the pedicel ob-conic; funicle joints all distinctly shorter and smaller than the pedicel, the first and third joints smallest, subequal, a third longer than wide, distinctly less than a fourth the size of the pedicel; second joint longest, a third longer than joint 1, a fifth longer than joint 5, somewhat over half the length of the pedicel, rectangular-ovate; joints 4, 5 and 6 broader, ovate, 4 distinctly larger than 3, somewhat more so than 5, joint 6 largest of the funicle with the exception of joint 2; it is broader than the latter. The club is short and ellipsoidal, very much larger than any of the funicle joints and distinctly twice the size of either the scape or pedicel, equal to over half the length of the funicle, or of the combined lengths of the scape and pedicel; bearing at least two long longitudinal grooves. Pubescence inconspicuous.

From a single specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen remounted in balsam from a tag in the U. S. National Museum collections labelled "Washington, D. C. 31-7-05. H. S. Barber."

Habitat.—United States: District of Columbia.

Type.—Type No. 13,812, United States National Museum, Washington D. C., one female in xylol-balsam.

This species resembles a *Polynema* somewhat on account of the narrowing of its abdomen proximad as if petiolate, but I have searched for a petiole in vain. It would be a characteristic species of that genus as it is of *Anagrus* because of its short-jointed antennae, straight caudal margin of the fore-wing, the narrow fore wings with the long marginal cilia and its general appearance.

DIAGNOSTIC TABLE

of the North American Species of *Anagrus* Haliday—Females, Males.
(Cf. Table for *Anaphe*.)

1. Species yellow or dusky yellow; at least some of the funicle joints longer than the pedicel, the proximal funicle joint minute; fore wings with the discal ciliation reaching to the venation, narrower, bearing from 5 to 11 lines of discal cilia.
 1. Fore wings narrow, with only about from 5 to 7 longitudinal lines of discal cilia across the widest blade portion.
 - a. Second funicle joint of antenna longer and more slender than the third, distinctly longer than the sixth.

Fore wings usually without a naked area in the blade distad near caudal margin; marginal cilia moderately coarse; bright yellow, varying so that the head, prothorax and abdomen may be black.....*armatus* Ashmead.

Fore wings with a naked area in the blade distad near the caudal margin; marginal cilia very fine; luteous.

spiritus Girault.

- b. Second funicle joint of antenna subequal to or shorter than the third, distinctly shorter than the sixth.

Fore wings with a naked area in the blade distad near the caudal margin; marginal cilia moderately coarse; lemon yellow.....*epos* Girault.

2. Fore wings broader, with about from 9 to 11 longitudinal lines of discal cilia across the broadest blade portion.

a. Fore wings without a naked area in the blade distad near caudal margin; funicle joints very gradually shortening distad.....*puella* Girault.

- II. Species black, marked with yellow at base of the abdomen or on thorax; at least some of the funicle joints longer than the pedicel.

1. Fore wings narrow, the discal ciliation normal; thorax yellow; a variant of *armatus*.....*armatus nigriventris* Girault.

2. Fore wings broad, the discal ciliation disappearing after the distal half of the wing; base of the abdomen yellow.

to Girault.

- III. Species entirely dusky black; funicle joints of antennae all shorter and much smaller than the pedicel.

Fore wings moderately broad, with about 12 longitudinal lines of uniform discal cilia across their widest blade portion, their caudal margins about straight.

a. Scape and pedicel subequal; trochanters, proximal tarsal joints and tips of the tibiae pallid.....*saga* Girault.

Genus *STETHYNIUM* Enoch.

1. *Stethynium laubum* species nova.

Normal position.

Female.—Length, 0.55 mm. Moderately small for the genus. Distinguished from all of the preceding species of *Anaphes* and *Anagrus* by the broad fore wings with normal, rather dense discal ciliation, the dilated marginal vein and the peculiar antennal structure, the club 3-jointed.

This genus was just recently described from England (Enock, 1909, pp. 452-459, pl. XII, figs. 1-5), and it is gratifying therefore to find it represented within our fauna. This North American species is gamboge in color, suffused with dusky and it resembles closely the type of the genus, excepting that the fore wings are less rounded at apex the

outline of the apex being more conical than in the case with the type species. The legs and basal three joints of the antennae are concolorous, the rest of the antennal joints dusky yellowish. Apparently no circular pits on the scape as described for the type species. Fore wing suffused with dusky proximad. Also the second funicle joint of the antenna is longer and the marginal cilia of the fore wing along the cephalic margin and at apex. The fore wings also appear to be considerably narrower and the body smaller.

Fore wings somewhat similar to those in *Anagrus* but decidedly broader, the excision or dilatation at base along the caudal margin pronounced, nearly a lobe, the discal ciliation uniform, moderately fine and dense, arranged in about fifteen to seventeen longitudinal lines across the widest portion of the blade; marginal vein somewhat dilated distad, moderate in length; marginal ciliation at the apex shorter than that along the cephalic wing margin, but around the apex to the caudal margin, lengthening, becoming very long a fourth of the distance toward the dilatation, the longest there being nearly seven-eighths the greatest wing width (they are at the greatest wing width). The longest marginal cilia of the posterior wings are three and a half times longer than the mean width of the blade of these wings, long and slender, but distinctly shorter than the longest cilia of the fore wing. Marginal cilia of fore wing along caudal margin sloping away in each direction from the longest, in other words gradated.

Tarsal joints short, tibial spurs single, short, straight; valves of the ovipositor exerted as in *Anagrus armatus* (Ashmead). Antennae 11-jointed, the club 3-jointed; as in the type species but the proximal funicle joint is stouter and slightly shorter than the third funicle joint, the second funicle joint is distinctly the longest joint of the funicle, slender; joints 4, 5 and 6 stouter, subequal to 3 in length, which, however, is slenderer. The club has a lamellate appearance due to the curved articulations between the three segments. Strigil present, the cephalic tibial spurs curved.

From 1 specimen, $\frac{3}{4}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—See beyond.

Described from a single female captured on the window of a railway station at Hendrix (Bloomington), Illinois, June 14, 1910.

Habitat.—United States: Bloomington and Urbana, Illinois.

Type.—Accession No. 44,244, Illinois State Laboratory of Natural history, Urbana, Illinois, one female in xylol-balsam.

Subsequently, I have obtained another species of this

genus from West Australia which is new and will be described elsewhere. Also, later I found a single male specimen of *faunum* in my personal collection mounted with miscellaneous mymarids (*Polynema howardii*; *Gonatocerus brunneus* and so forth) captured by sweeping low vegetation at Urbana, Illinois, May 25, 1910. The antennæ are filiform and 13-jointed, the flagellar points longitudinally striated, the joints subequal and gradually lengthening distad, excepting the proximal joint which is shorter nearly by a half than the second funicle joint, longer than wide, slightly longer than the pedicel which is globular. The twelfth and thirteenth joints forming a rather long club, the distal joint shorter. The funicle joints are acute at their disto-lateral margins. Otherwise as in the female, excepting that the abdomen is shorter and more blunt.

Tribe Mymarini.

Genus **EUSTOCHUS** Haliday.

1. **Eustochus xanthothorax** Ashmead.

Ashmead, 1887, pp. 193-194.

As stated above this is *Anagrus armatus* (Ashmead). The original specimen was in bad condition, a soiled female specimen, the body evidently wholly yellow, not as described; the tarsi 4-jointed, the abdomen sessile, not petiolate, hence it can not be an *Eustochus*; the original specimen was labelled in the handwriting of Ashmead, "*Eustochus xanthothorax* Ashm. Type." and "Jacksonville, Fla." on a printed label. No number was in connection with it. It agrees perfectly with *Anagrus armatus* Ashmead. No species of this genus have been found to occur in North America up to the present time.

Genus **POLYNEMA** Haliday.

1. **Polynema howardii** (Ashmead).

Cosmoceroma elegans Howard, 1881, p. 371, pl. xxlv, fig. 7.

Cosmoceroma howardii Ashmead, 1887, p. 184.

Idem, de Dalla Torre, 1890, p. 97.

This species was lost and nearly unrecognizable from its description and its identity in collections has been considerably mixed. It will be a difficult species to recognize with-

out comparing it with actual specimens of the allied species. Recently, I have found the original specimens and am able to fix the species as definitely as possible. It is apparently rare for I have not found it in Illinois nor in the miscellaneous specimens in the U. S. National Museum collections. In the U. S. National Museum collections, however, I have found the following type specimens from which the following notes were made. One tagmounted male type specimen labelled "*Cosmocoma elegans* Howard MS. (T) Type No. 2621, U. S. N. M. No. 722⁰. Proctotrypid or 3-spotted Kermes. Iss. Oct. 16, '80." Of this specimen, only the abdomen, a leg and a pair of wings remain. A fore wing and a posterior wing were removed and mounted in balsam (= Hym. slide 116, U. S. National Museum) and these notes made: Fore wings with the longest marginal cilia three-fourths as long as the greatest wing width, and with the discal cilia in about eighteen longitudinal lines across the greatest wing width, each cilium long or moderately long, the blade uniformly ciliate; wing hyaline; marginal cilia long. Posterior wing maculate with dusky, linear but not very narrow, the discal ciliation confined to the cilia along the edge, the line along the cephalic edge becoming paired distad, that of the caudal margin single. Tarsi 4-jointed, the proximal joint nearly as long as the other three united. Abdomen shining.

And a second tagmounted type male specimen labelled "*Cosmocoma* Howardii Ashm. ♂. *Cosmocoma elegans* Howard MS. (T). Type No. 2621, U. S. N. M. No. 722⁰. Proctotrypid or 3-spotted Kermes. Iss. Oct. 16, '80." The following notes: Body smooth, shining, without apparent sculpture, except on mesoscutum where there are fine lines and figures. Scutellum with a line of minute punctures across its distal two-thirds. Antennae with the proximal and ninth funicle joints subequal, shortest, somewhat longer than the short scape; funicle joints 2 to 8 subequal, longest, cylindrical oval, a third longer than the proximal joint; joints 10 and 11 (club) subequal, more slender, a fourth shorter than joint 2 of the funicle. Pedicel globular but longer than

wide, only half as long as the proximal funicle joint. Parapsidal furrows complete.

From this second specimen an antenna was removed and mounted in balsam, so as to aid in comparing the relative size and shape of the joints (= Hym. slide 119, U. S. National Museum). The foregoing two specimens are undoubtedly the original specimens of the species and the types.

This species is closely allied with the following species: *striaticorne* Girault, *enchenopæ* Girault and *consobrinus* Girault. I have mistaken it for all three, yet there are differences which I may be able to make clear, especially in the table of species given beyond. From *striaticorne* it differs in having less graceful, somewhat broader fore wings (what is said concerning this in Girault, 1911 a, is erroneous, wrongly determined specimens of *howardii* there used for comparison) with the discal ciliation fine yet each cilium longer than in *striaticorne* and with the marginal cilia distinctly longer; the fore wing instead of being long-elliptical is more ovate, broadening more distad. From the species *enchenopæ* differing at once by having the discal ciliation of the fore wing finer and the fore wing itself broader and the marginal cilia longer. From *consobrinus* it may be distinguished by its still much broader fore wings. Its position in the table of species will perhaps aid in identifying it better.

The species is recorded by Nason (1906, p. 8) in his Algonquin (Illinois.) list, but an examination of the single female specimen shows that it is *Polynema sibylla* Girault, and not *howardii*. Also Smith (1899, 1910) records it from New Jersey; it is quite possible that it occurs there but as yet has not been found in the eastern United States.

2. *Polynema striaticorne* Girault.

Since fully describing this species (Girault, 1911 a) I have seen and studied the following specimens besides the types: From the U. S. National Museum collection, remounted in balsam from tags—a single female labelled "Roslyn, Va., June 22"; a single female labelled "Ind. 700"; a female placed with a female of *bimaculatipenne* and a male of *graculus*, all labelled "Cosmocomma ♂ ♀. From wheat,

February, 1891. College Station, Texas. Webster"; a female specimen labelled simply "197"; two male specimens labelled "*Cosmocoma howardii* Ashm. ♂. 196"; seven females mounted on the same tag labelled "659 P. Uriah McCell"; and another female labelled "J. B. Norton, Riley Co., Ks. 4 Oct." also two females labelled "Colo. Baker. 855, 867"; and a female labelled simply "Washington, D. C." From the Nason Collection (Illinois State Laboratory of Natural History)—Three females labelled "*Cosmocoma maculipes* Ashm. ♀. Algonquin, Illinois, 5, 10, 96-151, 6810, 6786, 6788." From my personal collection—one female collected by sweeping, Urbana, Illinois, May 25, 1910; a male captured the following day in the same manner and place; two females captured on stable windows with *Gonatocerus anthronomi* Girault at Butler, Illinois, July 15, 1910; at Urbana, Illinois, on greenhouse windows, a female on April 30 and two males on May 24, 1910, and one female on July 27; two females with a female of (*Stephanodes*) *Polynema psecas* on a stable window at Mattoon, Illinois, July 16, 1910; and by sweeping grass in an orchard at Du Bois, Illinois, June 23, 1910, a single male. The species therefore is distributed as follows in the United States: New York (Albany, Geneva); Missouri (various localities); Illinois (Urbana, Algonquin, Butler, Mattoon and Du Bois); District of Columbia; Virginia (Roslyn); Indiana; Texas (College Station); Kansas (Riley County); and Colorado.

Variation occurs in *striaticornis* but not to any extent; the third funicle joint may be relatively shorter in some specimens in relation to the second, somewhat as is normal in *euchenopa* for instance; the proximal tarsal joints of the caudal legs may be shorter in some specimens; in the males, the scape may vary to yellowish and even the first funicle joint, occasionally, may vary to the same color; also in an occasional specimen, the antennal joints will appear to be shorter than typical. In both sexes the dusky black of the legs will vary in intensity and also in individuals of both sexes, at certain aspects, the peculiar sculpture of the "genus" *Stephanodes* Enock is observable on the scape but

not as strongly as in *P. evockii* Girault, for instance; nevertheless, at times a row of minute teeth is visible along the under side of the scape and a peculiar sculpture like that described for *P. psecas*; in most specimens however, these are not to be seen. The species is intense black of body, brownish-black with transmitted light.

3. *Polynema binaeulatipectus*: species nova.

Normal position.

Female.—Length, 1.10 mm. Moderate in size for the genus. Characterized by being black and having in the fore wings a slight fuscous round spot at the apex and a band of the same crossing the wing at about its middle.

General color black, the legs and antennae concolorous, suffused with some brownish, only the proximal three tarsal joints, the distal ends of the tibiae, the knees, the posterior trochanters and the abdominal petiole being pallid and tinged with slight yellowish. Venation dusky. Wings hyaline but a broad slight fumated band crosses the fore wing at its middle (less distinct at the immediate cephalic margin, somewhat more distinct at its middle) and distad nearly at the apical edge is a roundish fumated spot, moderately large.

Fore wings large, broad but not very much so, its discal ciliation fine and uniform, disappearing at the proximal edge of the fumated band (distad about the length of the antennal club from the venation) and arranged in about from twenty-six to thirty longitudinal lines at the greatest wing width; the marginal cilia of the cephalic margin short and fine but much longer than the discal cilia, that of the posterior margin much longer, yet but moderately long, thus being only about a fourth as long as the greatest wing width and but slightly longer than the longest marginal cilia of the posterior wing. Posterior wings broad, its margins parallel but distad ending in an obtuse point, bearing two distinct lines of discal cilia along each edge and a third line is indicated distad (four or five cilia) near the inner line along the cephalic edge; these lines abruptly disappear halfway proximal to the venation. The longest marginal cilia of the posterior wing about one and a half times longer than the width of the blade, the latter not noticeably broadened across the apex of the venation. Marginal cilia of the cephalic margin of the posterior wings short, shorter than the corresponding ones of the fore wing, about half as long as the blade of the posterior wing.

Abdomen ovate, somewhat shorter than thorax (excluding petiole), only the tip of the ovipositor exerted. Petiole cylindrical, stout long, three-fourths the length of the proximal tarsal joint of the caudal legs; metathorax with a narrow acute median carina. Parapsidal furrows complete. Tibial spurs short, single, those of the cephalic legs form-

ing a strigil and curved. All coxae short and obconic. Proximal tarsal joints long and slender, especially those of the caudal legs which are slightly longer or subequal in length to the combined length of the other joints, distinctly twice longer than the second joint.

Antennae normal to the genus. Scape moderate in length, not long, about as long as the pedicel and first funicle joint combined; pedicel obconic, slightly longer than the first funicle joint, which is four times longer than wide, somewhat over a half longer than the second funicle joint; the latter long and slender, a third longer than joint 3 which is slightly longer than 1; of the next three funicle joints, the second (joint 5) is shortest, not much longer than wide, rectangular, the first (joint 4) a fourth longer than the middle joint and the third (distal funicle joint) is nearly a third longer than the first (joint 4) or subequal in length to the proximal funicle joint but broader, cylindrical ovate; joint 3 of funicle slightly widening distad; joints 4, 5 and 6 each slightly wider in succession; club solid, long, conic-ovate, with longitudinal grooves leading from apex. Pubescence sparse, short, inconspicuous. The club is longer than the scape.

From a single specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Ransch and Lomb.

Male.—Unknown.

Described from a single female specimen remounted in balsam from a tag in the National Museum collections labeled "Cosmocoma. From wheat. College Station, Texas, Feb'y., 1891. Webster".

Habitat.—United States: College Station, Texas.

Type.—Type No. 23,813, United States National Museum, Washington, D. C., one female in xylol-balsam.

4. *Polynema caesariatipenne* species nova.

Normal position.

Female.—Length, 0.95 mm. Moderately small for the genus.

Allied with and resembling *maculipes* Ashmead but at once distinguished by its peculiar fore wings, which are more petiolate, the blade more paddle-shaped, its sides parallel, broader, its marginal cilia longer and finer, distinctly longer, but not very much so, than the blade's greatest width, the blade regularly elliptical-ovate, the discal cilia remarkable in being very long like hair, as long, or somewhat longer, for instance, than the long marginal cilia of the caudal margin of the posterior wings, but by far not as long as the marginal cilia of the fore wing; moreover it is somewhat curly and projects into the field of the marginal cilia. The coloration is the same as in *maculipes* but the yellow parts of the body are a less intense yellow, pallid to neutral yellow. The marginal cilia of the cephalic margin of the post-

rior wings is twice longer in this species than with *maculipes* and also the few discal cilia of the same wing are decidedly longer than in that species. Also the fore wing is uniformly fumated.

Fore wings with the long, hair-like discal cilia arranged in about fifteen longitudinal lines across the widest blade portion of the wing, the marginal cilia very fine, slender and long, about one and a fifth times longer than the greatest width of the wing, the latter about twice the width of the blade of the wing of *longipes*. Proximal tarsal joints slightly shorter than the combined lengths of the other three, long.

Antennae 9-jointed, normal. Scape long and slender, as long as the pedicel and first two funicle joints combined; proximal funicle joint very small, only a half the length of the pedicel and very much narrower, longer than wide; second funicle joint longest of the funicle, long and slender but not very long, widening somewhat distad, about a third longer than the next joint which is over twice the length of the first joint; joint 4 subequal in length to 1 but wider; joints 5 and 6 subequal, ovate, each somewhat longer than 4 but distinctly shorter than 3. Club very much the largest joint but slightly shorter than the scape. Pubescence soft and close, not conspicuous.

From a single specimen, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen remounted from a tag in the collection of the United States National Museum and labelled "Washington, D. C., July 30. Fredk. Knab, collector."

Habitat.—United States: District of Columbia.

Type.—Type No. 13,811, United States National Museum, Washington, D. C., one female in xylol-balsam.

This species is more closely allied with *setes*, but in the latter the contrasting yellow thorax, the narrower fore wings with the discal cilia somewhat shorter and the shorter second funicle joint of the antennae are characters which readily distinguish the two.

5. *Polynema maculipes* (Ashmead).

Cosmocoma maculipes Ashmead, 1887, p. 194.

Polynema maculipes (Ashmead) Girault, 1911 a, p. 22.

The original specimen—not the type—of this species was found in the collections of the United States National Museum mounted on a tag; it was labelled "*Cosmocoma maculipes* Ashm. Type. Jacksonville, Fla." and had no number

in connection with it. Being remounted in balsam, I now redescribe it and deposit the specimen as type in the collection from which it was obtained.

The species belongs in that group of the genus having narrow fore wings and coarse discal ciliation and thus is allied with *longipes* and *setes* from both of which it may be distinguished by its broader, less slender fore wings, the longest marginal cilia of which are barely longer than the wing is wide. Compared with *longipes* its fore wings are broad, but compared with the species like *striaticornis* and *howardii*, they are narrow. The wings are also somewhat as in *enchenopae* as concerns discal ciliation and general appearance but are noticeably narrower and the ciliation is more coarse.

Male.—Length, 0.90 mm. Moderately small for the genus.

General color black, the legs, abdominal petiole, scape and pedicel yellow (subtestaceous), the wings hyaline; distal tarsal joints and venation brown-black.

Fore wings moderately narrow, with long marginal cilia, the longest about equal in length to the greatest wing width, the discal ciliation coarse and moderately long, arranged in about ten longitudinal lines across the widest portion of the wing blade, the latter shaped like a paddle. Posterior wings linear, the marginal fringes along the caudal margin long, distinctly shorter than the longest cilia of the fore wing but four or five times longer than the width of the blade of the posterior wings. The latter without discal ciliation other than the paired lines along each margin. Proximal tarsal joints long, subequal in length to the combined lengths of the second and third joints.

Antennae missing, excepting the first six joints of one. Normal for the male. Scape short but longer than the short, obconic pedicel; funicle joints filiform, distinctly striated longitudinally, the proximal funicle joint a fourth longer than the pedicel, the next three subequal, a fourth longer than the first funicle joint.

From 1 specimen, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Female.—Unknown.

Redescribed from the single original male specimen, remounted in balsam.

Habitat.—United States: Jacksonville, Florida.

Type.—Type No. 13,815, United States National Museum, Washington, D. C., one male in xylol-balsam.

This species has been recorded from Illinois by Nason (1906, p. 8) but the six specimens found in the Nason collection (Illinois State Laboratory of Natural History) are not referable here but represent several species (*striaticorne*, *consobinus*).

6. *Polynema graculus* species nova.

Normal position.

Male.—Length, 1.10 mm. Moderately large for the genus.

A species characterized by having the broadest fore wings yet observed in a species of the genus; the fore wings are shorter and more rounded, less graceful and nearly as in the broad-winged species of *Gonatocerus* (e. g. *dolichocerus*).

General color jet black, only the knees, tips of tibiae and proximal two tarsal joints being pallid, the trochanters and abdominal petiole brownish; wings hyaline excepting proximad, caudad of the venation, where there is slight fumation. Venation black.

Fore wings less slender than usual, shorter and broader, less graceful than usual, the discal ciliation arranged in about thirty-five longitudinal lines of cilia at the widest blade portion, moderately dense, fine; the marginal cilia only moderate in length, the longest only somewhat over a fourth the length of the greatest wing width; venation usual. Posterior wing moderately broad, subacuminate but only obtusely pointed at tip, the discal cilia absent proximad (nearly the proximal half), distinct, consisting of the usual paired lines along each margin (which here are somewhat away from the margins) and in the midlongitudinal line of the blade, distal half, several irregularly placed cilia, some paired; longest marginal cilia (caudal margin) not quite twice the length of the blade's greatest width, becoming paler and shorter proximad. Abdomen much shorter than the thorax. Legs slender, the proximal tarsal joints of the caudal legs long and slender, equal to the combined length of the distal three; strigula present. Tibial spurs single, moderately short but rather strong.

Antennae usual for this sex, 13-jointed, the flagellar joints all longitudinally striate, rather finely so; scape short but about twice the size of the pedicel; the latter with one lateral margin incised, the other convex, short; first funicle joint about twice the length of the pedicel and about a fourth or fifth shorter than the following joint; remaining joints subequal, the club joint shortest of the flagellum, ovate, very slightly shorter than the proximal funicle joint.

From 1 specimen, $\frac{1}{2}$ -inch objective, 1-inch optic, Hausch and Lomb.

Female.—Unknown.

Described from a single male specimen from the collec-

tions of the Milwaukee Public Museum, Milwaukee, Wisconsin, remounted from a tag and which bore the following labels: "Milw. Co., Wis. VI. 1. 1900. 37,016." Collected by Mr. C. T. Brues.

Habitat.—United States: Milwaukee County, Wisconsin; College Station, Texas.

Type.—Type No. 13,816, United States National Museum, Washington, D. C., one male in xylol-balsam (mounted with *Gonatocerus fasciatus* Girault and an *Anaphes*).

Later, another male specimen of this species was found mounted with the species *bimaculatipenne* and *striaticorne* and labelled "From wheat. Febry. 1891, College Station, Texas. Webster." From the United States National Museum collection.

7. *Polynema consobrinus* species nova.

Normal position.

Female.—Length, 0.75 mm. Moderate in size for the genus.

A species related to *enchenopæ* Girault and easily confused with it but differing as follows: Primarily in having finer discal ciliation in the fore wing; in this species the discal cilia are arranged in about fifteen lines across the widest blade portion, in *enchenopæ* in only about twelve lines; but this difference does not distinguish the two enough—the quality of the discal ciliation is different; thus in *enchenopæ* the individual cilia are twice if not thrice the size of those in this species. Differing also in having the fourth and fifth funicle joints of the antennæ subequal, whereas in *enchenopæ*, the fourth is smaller than the fifth. The proximal tarsal joints of the caudal legs are also relatively shorter in this species. Otherwise, the two species are indistinguishable. The line of foveæ across the apex of the scutellum is present.

From 17 specimens, $\frac{3}{4}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown. (See beyond.)

Described from the following series of specimens: (1) From the United States National Museum collections, remounted from tags—a single female labelled "From Webster. Unique. 16th". Also one female labelled "Ohio. 1705". (2) From the Nason collection (Illinois State Laboratory of Natural History, Urbana) remounted in balsam from tags—three females labelled "*Cosmosoma maculipes*

Ashm. Algonquin, Ill., 5-10, 12, 13, '96—151 " and " 6807 ", " 6787 " and " 6785 " respectively. (3) By collecting myself in Illinois—at Urbana, on greenhouse windows, seven females (April 30, 1910), one female (June 8, 1910); at Urbana by sweeping, one female (May 26, 1910); at Pulaski along the edges of a cypress swamp, May 14, 1910, one female (C. A. Hart and A. A. G.); and at Centralia on windows one female (August, 1909). Also a single female reared from the eggs of *Enchenopa binotata* (Say), Chicago, Illinois, together with the species *enchenopa* and mounted with the co-types of that species.*

Habitat.—United States: Ohio; Illinois, (Chicago, Urbana, Pekin, Centralia, Algonquin, Normal and Pulaski); Michigan (Agricultural College).

Type.—Type No. 13,817, United States National Museum, Washington, D. C., one male in xylol-balsam (Pulaski, Ill., May 14, 1910).

Cotype.—Accession No. 47,245, Illinois State Laboratory of Natural History, Urbana, four females in xylol-balsam, 1 slide (Urbana, Ill., April 30, 1910).

This species may be confused with *howardii* but is smaller and resembles it in the wing cellation only. It is common in Illinois.

Subsequently, I have found the following specimens: A single female in the collections of the U. S. National Museum labelled "Ag. Coll., Mich. 356. Baker". Two females captured at Urbana, Illinois, by sweeping blue-grass and clover, June 8, 1910 (A. A. G.). And from the Nason collection, placed with a single female of *striaticorne*, three females bearing the label "*Cosmocoma maculipes* Ashm. ♂, Algonquin, Ill. 5-10, 96—151 ", and " 6810 ", " 6796 " and " 6788 " respectively. From the collections of the Illinois State Laboratory of Natural History: Four females (Accession No. 16,270) captured with a female of *longipes* at Urbana, Ill., by sweeping wheat, May 7, 1891 (Marton); one

* This specimen differed from the others of *consobrinus* in having the third funicle joint longer, but slightly shorter than the second; but I do not think it can be another species.

male* (Accession No. 3316) by sweeping in woods, Pekin, Ill., August 14, 1883 (S. A. Forbes); another single male (Accession No. 3391) collected at Normal, Ill., June 15, 1883 (Forbes).

As the fore wings of this species vary somewhat in width, so that occasionally the largest marginal cilia exceed slightly the greatest wing width, *longipes* may become confused with it.

8, *Polynema silylla* species nova.

Normal position.

Female.—Length, 1.50 mm. A large robust species with broad fore wings.

This species is undoubtedly allied with *needhami* Ashmead, agreeing with the general original description of that species, but very distinctly disagreeing from the statement made in the original description of *needhami* that the ovipositor is exerted for two-thirds the length of the abdomen. In this species it is exerted only for about a fourth of the length of the body of the abdomen and thus is not exerted to any great extent, not considerably as is the case with *needhami*. This species resembles very closely (*Staphanodes*) *Polynema enockii* (Girault) but may be distinguished at once by its shorter proximal funicle joint of the antenna, which is typical for the genus, distinctly much shorter than the typical long second funicle joint.

General color deep black, the legs, abdominal petiole, scape, pedicel and proximal funicle joint intense chrome orange, the named antennal joints pale yellow; also of the legs, the cephalic and intermediate tibiae are fuscous, or nearly, the distal tarsal joints black. Venation brown-black like the six distal antennal joints. Wings perfectly hyaline. Exserted valves of ovipositor black.

Fore wings broad, broader than in *howardii*, broad and long yet graceful as in *Polynema enockii* (Girault), the discal cilia moderately size, arranged in about from twenty-seven to thirty longitudinal lines at the broadest blade portion, the marginal cilia but moderate in length, the longest not quite half as long as the greatest width of the wing, somewhat longer than the longest marginal cilia of the posterior wing. The latter is long and slender, with the usual discal ciliation.

Proximal tarsal joints long and slender, especially those of the posterior legs which are subequal in length to the distal three joints, the second joint in the posterior legs long also, but not quite a half the

* The males differ only in the secondary character. Their funicle joints are long and slender, longitudinally striate, about six times longer than wide, the distal and proximal flagellar joints subequal, a fourth shorter.

length of the first. Strigils present. Valves of ovipositor exerted but not very much, only for about a fourth of the length of the abdomen.

Antennae normal; scape broad, somewhat longer than the pedicel and first funicle joint united; pedicel subequal in length to the proximal funicle joint which is slender but somewhat less than a half of the length of the long second joint; the latter longer than the scape and about a fourth longer than the third funicle joint which is long, two-thirds longer than the proximal and fourth funicle joints taken separately; joint 4 wider; joint 5 slightly wider and longer than 4; the sixth or distal funicle joint still somewhat longer and wider, distinctly shorter than funicle joint 3, cylindrical-ovate. Club long-ovate, normal. Scape without peculiar sculpture; pubescence not conspicuous.

From a single specimen, $\frac{1}{2}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Length, 1.43 mm. The same, but the legs and abdominal petiole are dusky, the scape and pedicel pallid yellowish, the knees, trochanters and proximal three tarsal joints pallid yellowish.

The joints of the flagellum are very long and longitudinally striate, the distal or club joint about a third shorter, the proximal funicle joint slightly shorter than the next joint, the latter and those remaining subequal in length, about four times the length of the pedicel.

From 2 specimens, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Described from the following specimens, mounted in xylol-balsam: A male specimen mounted on a tag in the U. S. National Museum collections labelled in Ashmead's hand "*Cosmocoma flavipetiolata* Ashm. Type. Arlington, Va."; another male in the same collection but without labels; and a tag-mounted female specimen in the collection of the Milwaukee Public Museum, Milwaukee, Wisconsin, labelled "*Polynema needhami* Ashmead. ♀. Milw. Co., Wis. VI, 1, 1906. 37,017".

While this species so closely resembles *needhami*, as known through the latter's general description, yet it can not be reconciled with the description of that species on account of the statement therein that the ovipositor is exerted for two-thirds the length of the abdomen; in this genus, the fact that it resembles *needhami* in color is nearly meaningless, for other distinct species so resemble each other. The ovipositor in *sibylla* is not exerted for any length.

Habitat.—United States: Wisconsin (Milwaukee); Virginia (Arlington); Illinois (Algonquin).

Type.—Type No. 13,818, United States National Museum, Washington, D. C., one female in xylol-balsam, 1 slide (Milwaukee, Wis.).

Cotype.—Accession No. 44,246, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in balsam (Algonquin, Ill.).

Subsequently I have found another female of this species remounted in xylol-balsam from a tag in the Nason collection and labelled in Ashmead's handwriting "*Casmocoma howardii* Ashm. Algonquin, Ill. 5. 10. 96. 151. 6809." This is designated as the cotype (head missing); see Nason (1906, p. 8).

9. *Polynema piccipes* Girault.

Polynema piccipes Girault, 1905, pp. 91-92.

Polynema piccipes Girault, 1911 a, p. 22.

From the single type specimen of this species I have taken the following notes: Second funicle joint of antenna longest, slender, nearly thrice the length of the first joint and a third longer than the third funicle joint; fourth funicle joint subequal to the first; fifth and sixth subequal, oval, shortest, a third shorter than the first; funicle gradually enlarging beyond the second joint; club of antenna large, egg-shaped, distinctly longer than the united lengths of joints 2 and 3 of the funicle; funicle joint 3 long-ovate, 4 cylindrical oval; pedicel slightly longer than the proximal funicle joint. Fore wings narrow, moderately, densely, uniformly ciliate, the longest marginal cilia about a third as long as the greatest wing width, hyaline. Fore wings with the discal cilia arranged in about from ten to twelve to fifteen longitudinal lines at the widest blade portion, each cilium moderately long but the lines not separable. Ovipositor not at all exerted. Body shining, no conspicuous sculpture. Fore wing with a clear naked band across it just beyond the apex of the venation, the discal ciliation disappearing abruptly proximad some distance distal of the venation; in this type specimen,

this clear naked band was followed by a lightly fumated band across the proximal boundary of the discal ciliation.

The specimen is a female mounted on a tag in the U. S. National Museum collection labelled "*Polynema picipes* Girault ♀. Type No. 8943, U. S. N. M. J. H. Beattie, Collector. Ft. Valley, Ga. VI, 20." The antennae and a fore wing have been remounted in balsam on a single slide, labelled "Hym. Slide 115", United States National Museum.

In the collections of the United States National Museum I have found a single specimen of this species, tagmounted, now remounted in xylol-balsam which bore this label—"Oswego, N. Y. August 4, 1896". This specimen has been compared with the type and hence is now designated a homotype. The species thus occurs in Georgia and New York. The narrow fore wings having fine discal ciliation and only moderately long marginal ciliation (not by far longer than the greatest wing width) and the shortened distal three funicle joints, the comparatively very long second funicle joint are characteristics which make the identification of this species easy.

Homotype.—Accession No. 44,247, Illinois State Laboratory of Natural History, Urbana, one female in xylol-balsam (Oswego, N. Y.).

10. *Polynema zetes* species nova.

Normal position.

Female.—Length, 0.80 mm. Small for the genus.

Similar to *longipes* but differing as follows: The whole of the thorax is pale cadmium yellow; the fore wings are less petiolate and broader, their discal cilia decidedly longer and the antennal joints differ in that the second funicle joint is shorter, not distinctly twice longer than the third joint; also the proximal funicle joint is much shorter than in *longipes*; the second funicle joint in *longipes* is distinctly longer than the pedicel, barely longer in this species.

General color black; general appearance that of *longipes* but the body is more slender, the fore wings less graceful and more densely ciliate discally. Thorax pale cadmium yellow; legs, antennal scape and pedicel and abdominal petiole lemon-yellow, the proximal funicle joint somewhat darker. Wings slightly, uniformly fumated. Venation, distal tarsal joints, distal five funicle joints and the club black or nearly, but the whole funicle is more or less suffused with yellow.

Fore wings shaped as in *longipes* but the blade is less petiolate, widening farther proximad and broader, the discal ciliation distinctly coarser and long, at the widest blade portion arranged in about twelve longitudinal lines, the marginal ciliation as in *longipes* but coarser and not quite so long in relation to the greatest wing width, though distinctly longer than the greatest wing width. Posterior wings as in *longipes* but shorter; very narrow and straight. Legs as in *longipes*; also other body characters. Ovipositor not exerted. Vertexal carinae present.

Antennae 9-jointed. Scape as long as the pedicel and first two funicle joints combined; pedicel globular-obconic, longer than the proximal funicle joint, slightly shorter than the second funicle joint; the latter longest of the funicle joints, only moderately long, widening slightly distad, over twice the length of the short proximal funicle joint which is not much longer than wide. The third joint is about a third shorter than the second. Joints 4 and 5 shorter and broader, subequal, but 5 slightly shorter, about a third shorter than 3; joint 6 of the funicle somewhat longer than either of the two preceding joints but not as long as joint 3, broader than joints 4 or 5. Club abruptly very large, ovate, as long as the combined lengths of joints 2, 3 and 4 of the funicle. Pubescence sparse; the club minutely hispid.

From 1 specimen, $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Unknown.

Described from a single female specimen taken on greenhouse windows at Urbana, Illinois, July 27, 1910.

Habitat.—United States: Urbana, Illinois.

Type.—Accession No. 44,248, Illinois State Laboratory of Natural History, Urbana, Illinois, one female in xylol-balsam. *Cotypes*.—Cat. No. 23,819, United States National Museum, Washington, D. C. (two females in xylol-balsam, 1 slide; with a specimen of *P. longipes* and a *Gonatocerus*).

This species more closely resembles *caesariatifenne* because of the somewhat long, somewhat hair-like discal cilia of the fore wings, but otherwise they are distinct and may be distinguished by aid of the table of species given beyond. In this species, however, the discal cilia are more like those of *maculipes*, those of *longipes* being the nearest to normal ciliation, nearly normal in fact. The species *caesariatifenne* has this ciliation unusually long, like hairs.

I have since seen two other females of this species mounted

in balsam and captured together with a female of *longipes* on a window of a greenhouse at Urbana, Illinois, July 27, 1910, or at the same time the original specimen was captured.

11. ***Polynema longipes* (Ashmead).**

Ooetonus longipes Ashmead, 1887, p. 192.

Polynema citripes Ashmead *nomen nudum* of authors. (See Girault, 1911 a, pp. 19-22).

An examination of the type or rather original specimen of *Ooetonus longipes* Ashmead shows that it is a typical *Polynema*. It is the same species designated in the literature as *Polynema citripes* Ashmead, and which was about to be described under that name. The name of course will have to be changed to *Polynema longipes* (Ashmead). The original specimen was found on a tag in the collections of the United States National Museum labelled *Ooetonus longipes* Ashmead in Ashmead's handwriting and "Jacksonville, Fla." It also bore a yellow label upon which was written "Type" but no number was in connection with it. It has been remounted in xylol-balsam and designated as the type. It is a female. The species is widely distributed in the United States. No species of *Ooetonus* have been described from the United States, though there is an *Ooetonus homotodiscus*, a *nomen nudum* extant in the literature, indicating that the genus is found here.* The species in general appearance resembles a narrow-winged "*Stephanodes*" (= *Polynema*) and varies considerably in color, the yellow parts varying from pale lemon-yellow to intense chrome orange. The width of the fore wings also varies somewhat.

I have since captured, or have obtained, the following specimens in Illinois and elsewhere: Mattoon, Ill., stable windows (July 16, 1910, one female); one female in the National Museum collections bearing the labels: "*Cosmocoma* ♀. *Litus tenuipennis*. From Fitch's collection. 11,901". Another female in the same collection, without labels. A slide in the collection of the National Bureau of Entomology bearing two females and labelled "From C. W. Mally, Wooster, Ohio. Dec. 17, '97. In breeding-cage containing wheat."

* The *Ooetonus* mentioned by Girault (1905, p. 92) is a proctotrypid.

Also these: One female specimen captured with two females of the species *setes* at Urbana, Ill., July 27, 1910, on greenhouse windows; a female captured on the pane of a small window in a shed on a farm at Centralia, Ill., August 27, 1909, in company with *Camptoptera pulla* Girault and *Anagrus armatus nigriventris* Girault; a female captured at Urbana, Ill., April 30, 1910, with *Anagrus armatus* Ashmead, and another captured at Centralia, Ill., September 2, 1909, with *Anagrus epos* Girault. Finally, a single female captured with four females of *consobrinus* by sweeping wheat, Urbana, Illinois, May 7, 1891, Marten (Accession No. 16,270, I. S. L. N. H.).

The species is widely distributed in the United States and common. For other information concerning it, see Girault (1911).

Type.—Type No. —, United States National Museum, Washington, D. C., one female in xylol-balsam (the original specimen). Homotypes were designated by Girault (1911, pp. 21-22).

12. *Polynema euchenopæ* Girault.

Since describing this species (Girault, 1911 a, pp. 15-18) I have seen the following specimens of it: A single female specimen found mounted on a tag in the collections of the Illinois State Laboratory of Natural History, Urbana, labelled "Chicago, Ill., X. 4. 1909", and collected by J. J. Davis. Also a single male specimen mounted in balsam and labelled "Greenhouse, Urbana, Ill., May 31, 1910. Girault." The species must be distributed at least throughout the northern half of the State of Illinois.

13. *Polynema bifasciatipenne* (Girault).

I have a female specimen of this species from the New York Experiment Station, labelled "*Ecanthus* eggs. Sep. 8, 1910. P. J. P. Coll. N. Y. Exp. Sta."; it was reared in New York State. Under the *nomen nudum* *ecanthi*, this species is recorded from New Jersey by Smith (1900; 1910) but evidently not from actual specimens. However, the species should occur there.

DIAGNOSTIC TABLE

of the North American species of *Polynema* Haliday.—Females.

- A. First funicle joint of antenna normal, short, distinctly shorter than the second (except *bifasciatipenne*).
- I. Fore wings narrow, their marginal cilia longer than their greatest width, or as long, their discal cilia coarse.
1. Discal cilia of fore wing usually long like fine hair, as long as the longest marginal cilia of the caudal wings. Fore wings comparatively broad.
Marginal cilia long and fine, a fifth longer than the greatest width of the fore wing. Black, legs pallid yellow; second funicle joint of antenna a third longer than the third joint; marginal cilia of cephalic margin of posterior wing longer than usual.....**caesariatipenne** Girault.
 2. Discal cilia of fore wing coarse but not long and hair-like; distinctly not as long as the longest marginal cilia of the caudal wings.
Marginal cilia of fore wing about equal to that wing's greatest width; about eleven times of discal cilia.
Black, legs yellow.....**maculipes** Ashmead.
Marginal cilia of fore wing distinctly longer than that wing's greatest width, the fore wings more slender.
Species black, the thorax and legs yellow; wings broader, their discal cilia coarser and longer; second funicle joint barely longer than the pedicel.....**zetes** Girault.
Species black, the legs pale yellow; wings very narrow, their discal cilia nearly normal; second funicle joint distinctly longer than the pedicel.....**longipes** Ashmead.
- II. Fore wings broader, their marginal cilia shorter than their greatest width.
1. Fore wings with dusky fasciae or spots. Species brown or black.
Species brown, the fore wings with three (two distinct) brown bands; proximal funicle joint long.
bifasciatipenne Girault.
Species black, the fore wings with two dusky, rounded spots; proximal funicle joint short, normal
bimaculatipenne Girault.
 2. Fore wings hyaline, species black.
 - a. Ovipositor exerted for two-thirds length of abdomen.
First three antennal joints, petiole and legs honey-yellow.
needhami Ashmead.
 - b. Ovipositor not or but slightly exerted; if exerted not for more than a fourth the length of the body of the abdomen.

- (1). Legs, excepting anterior coxae and the femora, honey-yellow. Funicle joint 4 distinctly longer than joints 5 or 6.

Fore wings narrow, the longest marginal fringes only a third as long as the greatest wing width.

picripes Girault.

- (2). Legs chrome-orange; funicle joint 4 slightly shorter than joints 5 or 6 of the funicle.

Fore wings very broad and long, with from twenty-seven to thirty lines of discal cilia, the marginal cilia moderate in length.....*sibylla* Girault.

- (3). Legs fuscous or darker, pallid at the articulations and tarsi only.

Second funicle joint of antennae barely a third longer than the third joint, the latter relatively long; fore wings graceful, their discal ciliation fine.

striaticorne Girault.

Second funicle joint of antennae nearly a half longer than the third joint, the latter relatively shorter; fore wings broader.

Discal ciliation of fore wing relatively coarse.

enchenopæ Girault.

Discal ciliation of fore wing fine.

consobrinus Girault.

(*Cf. male graculus* and *howardii*.)

- B. Second funicle joint of antenna abnormal, long, subequal to the second.

- I. Fore wings broad, their marginal cilia much shorter than their greatest width.

- I. Scape with a peculiar sculpture, serrate beneath; color black, marked with chrome-yellow; wings hyaline.

pseus Girault.

(*Cf. bifasciaticenne* Girault.)

STEPHANODES Enoch (= *Polynema* Haliday).

1. (*Stephanodes*) *Polynema pseus* (Girault).

I have recently obtained specimens of the type species of this genus ("*elegans*" Enoch) through the kindness of Mr. C. O. Waterhouse some time the well-known keeper of the section of insects in the British Museum. Also, I have found in my own collections a male of the American species, thus enabling a comparison of the two sexes of the species. The two species are very much alike indeed, surprisingly similar in details of coloration, notwithstanding what is said con-

cerning this in the original description of *pseus* (in reference to the females alone). However (females) the two species differ as follows: *pseus* has the fore wings more graceful, narrower and not quite so long as in "*elegans*" (for instance while I can see the discal ciliation of the fore wings of "*elegans*" through a hand lens—triple aplanat. 25 mm., Bausch and Lomb—through the same lens it is not differentiated from the general wing surface in the case of *pseus*); in *pseus*, the first funicle joint of the antenna is distinctly longer than the second (the second distinctly longer than the first in "*elegans*"); of the three distal funicle joints in *pseus*, the intermediate one is the shortest, in "*elegans*" the longest of the three (about thirty longitudinal lines of discal ciliation in "*elegans*", in *pseus* about twenty-five, at the widest portion of the blade); the males of the two species are very similar; however in *pseus* the posterior wings lack any mid-longitudinal discal ciliation with the exception of two or three at apex, whereas in "*elegans*", there are ten or fifteen irregular cilia; the fore wings, of course, are also broader as in the females. The male body and antenna are colored as in the female. The two species may be identical but deserve to be separated until more material has been studied; they must be closely allied and seemingly are the same thing, showing environmental variation, like the closely related native species of neighboring islands.

The following additional specimens: One male specimen captured at Mattoon, Illinois, July 16, 1910, on stable windows; a female taken in the same place at the same time; a female found on a tag in the United States National Museum collections labelled "From Webster. 4th Unique"; also finally a female from the same collection bearing no data. Thus far it has been found only at Urbana and Mattoon, Illinois.*

* Subsequently, in the collections of the Illinois State Laboratory of Natural History, another headless specimen (female) recognized by its color and fine discal ciliation of the fore wing; this was on a tag numbered 1418 and was collected under mulch in a strawberry field, Normal, Illinois, March 27, 1884 (F. M. Webster).

2. *Polynema enockii* Girault, nomen novum.

Stephanodes elegans Enock, 1906, pp. 457-458, pl. XIV, figs. 6-11.

Polynema elegant Foerster, Proc.

The specific name *elegans* is preoccupied in *Polynema* and since *Stephanodes* is synonymous with that genus, the name falls. If the species *puccas* and *enockii* prove identical, then *enockii* will hold. The species is British (England).

The reasons for considering *Stephanodes* synonymic with *Polynema* should be given and are as follows:

The teeth along the under side of the antennal scape are common to several species of *Polynema* and seem to graduate in others, without accompanying correlation. Thus in *Polynema straticorne* Girault they are present and distinctly visible at times, but the proximal funicle joint of the antenna remains short and usual. In *Polynema redwiohi* Perkins, on the contrary, the unusual long proximal funicle joint of the antenna is present, apparently without the correlating teeth of the scape. Hence the characteristics of *Stephanodes* lose their value in being too variable and graduate and must be considered as having no more than specific value. There is nothing in the general appearance of *Stephanodes* to indicate a distinctness from *Polynema*; in appearance the genus is typically *Polynema*. I think the foregoing facts are sufficient, in themselves, to establish the identity of the two. The serration of the scape occurs in other genera, it being marked in (*Oophilus*) *Gonatocerus longicauda* (Enock), for instance.

The following notes on extraterritorial species are added:

Polynema brasiliense Ashm.

Ashmead, 1904, p. 521.

From the single female tagmounted, type specimen in the United States National Museum, labelled "*Polynema brasiliense* Ashm. ♀ type" in Ashmead's handwriting, and "Chapada, April", I have taken the following notes:

Antennae 9-jointed. Second and third funicle joints long and slender, subequal, twice the length of the first and fourth, which are subequal; fifth and sixth subequal, one-third shorter than the fourth or first; club an egg-shaped solid piece, abruptly enlarged and as long as either the second or third funicle joint; scape short; pedicel one-third

shorter than proximal funicle joint. Ovipositor distinctly exerted but not for any length (about a third or less of the body of the abdomen). Sculpture of body polygonal figures, scaly. Scutellum with a line of round foveae before its apex, following its outline; parapsidal furrows complete, widely separated, nearly straight; fore wing moderately densely ciliate but naked near the cephalic margin and for some distance out from the marginal vein excepting for a single line of cilia in the latter place and two short lines leading along the margin from the marginal vein in the former. Marginal cilia where longest, only between a third and a half of the greatest wing width. Posterior wing very narrow and slender, linear, without discal ciliation at all but a line of cilia along each wing edge; the marginal cilia of the posterior margin over four times the width of the wing blade. Fore wing distinctly fumated its entire length. Middle of metathorax elevated as in *bifusciatipenne*, the margins acute. Proximal tarsal joint as long as the other three united. Metathoracic spiracle minute, round. There is a carina leading from it, having its origin just off (caudo-mesad) of the spiracle, running nearly caudad, and another shorter one, oblique, running caudo-mesad from the lateral aspect toward the caudal end of the first, forming a more or less obscure V-shaped figure. Fore wings with about fifteen longitudinal lines of discal cilia, each cilium moderately long and the lines separated.

(Hym. slide 114, U. S. National Museum—pair of wings.)

***Polynema rufescens* Ashmead.**

Ashmead, 1904, p. 521.

From the single male tagmounted type specimen in the United States National Museum collections, I have made the following observations. The specimen was labelled "*Polynema rufescens* Ashm. ♂ type. ♂ type No. 6595, U. S. N. M. Buito Prov., Pernambuco, Brazil. Feb. 83".

Body brown. Fore wings deeply fumated. Parapsidal furrows complete, curved, widely separated. Body shining, the sculpture nearly imperceptible, delicate, polygonal figures. Metathorax with the usual central triangular elevated portion, whose margins are carinated, and with two lateral carinae, the first prominent, originating cephalo-laterad of the minute circular spiracle and running caudo-mesad to the mesal elevation and in front of the spiracle; the second is nearly parallel with the first but caudad of the spiracle, originating in the lateral aspect directly laterad of the spiracle, and running in a gentle convex curve caudo-mesad as to general direction but the curve finally caudo-laterad. The spiracle is between these, nearer to the first. Antennae filiform, 13-jointed, the funicle joints with numerous long carinae, stiff grey pubescence and gradually increasing in length

distad except the club joint which is shorter than the preceding joint by about a third. Joints 2 to 10 subequal, longest, a third longer than the proximal joint, the scape subequal to them or slightly longer. Club joint and proximal funicle joint subequal. Pedicel globose, somewhat longer than wide. Lateral ocelli not touching the eye margins. Posterior wings hyaline but tip tinged with some brownish; no discal cilia, excepting a double row along the edge of the caudal margin and a single row along the cephalic margin; also some brownish just out from the marginal vein over the whole blade. Marginal cilia of posterior margin not more than twice the width of the wing blade which is not linear but acuminate and slightly curved. Whole of the blade of cephalic wing clouded, excepting the clear portion proximal of the end of the marginal vein and a less regular, less clear area just distad of a distinctly deeper band across the wing just at the end of the marginal vein (or stigmal vein). Marginal cilia moderately short, the longest only a fourth the greatest wing width. Discal ciliation uniform, about seventeen longitudinal lines. Marginal vein deflexed into a distinct, true stigmal vein, which is shaped like a snake's head. Discal ciliation not dense enough to obscure cilia. Scutellum not visible. Head behind the eyes longitudinally striate, the striations delicate.

(Hym. slide 118, United States National Museum—pair of wings).

From the foregoing and the following list of species, a complete catalogue of the North American Mymaridae can be compiled. The added list is given for convenience. The remaining described North American species are:

1. *Leimacis aspidioticola* Ashmead.
Leimacis aspidioticola (Ashmead). Position uncertain and species unknown.
2. *Lachardiella putuamii* (Packard).
3. *Alaptus iceryae* Riley.
4. *Alaptus globosicornis* Girault.
5. *Alaptus intonsipennis* Girault.
6. *Alaptus racetii* Girault.
7. *Alaptus eriococci* Girault.
8. *Anaphoidea conotracheti* (Girault).
9. *Anaphoidea pullicrura* Girault. (Mentioned in foregoing.)
10. *Anaphoidea sordidata* Girault.
11. *Camptoptera clavata* Provancher.
12. *Camptoptera pulla* Girault. (Mentioned above.)
13. *Mymar venustum* Girault.
14. *Macrocamptoptera metotarsa* (Girault).
15. *Cosmoceromyidea merrilli* Howard.

The following *nomina nuda* exist:

- Ooctonus homoladiscæ* Ashmead.
Polynema acanthi (= *bifasciatipenne*).
Polynema citripes (= *longipes*).
Polynema aspidioti Girault MS.
Discopus halitus Girault MS.
Anthemiella rex Girault MS.
Metamymar aleurodis Riley MS., 1885.
 (And perhaps *Litus tenuipennis* = *longipes*).

In the list given by Nason (1906, p. 8), there occurs *Gonatocerus websteri* Ashmead a misprint for *websteri*, an MS. name never in print but found on specimens of *Gonatocerus anthonomi* Girault in the Nason Collection and in the collections of the United States National Museum.

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