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RESULTS OF THE UNIVERSITY OF MICHIGAN-
WILLIAMSON EXPEDITION TO COLOMBIA
1916-1917¹

II. A NEW SPECIES OF AGRIOGOMPHUS (ODONATA)²

By E. B. WILLIAMSON

The genus *Agriogomphus* was described by de Selys in 1869.³ Four years later, in 1873,⁴ in describing *Cyanogomphus*, he took the opportunity of making some corrections and additions to the original description. Since then the genus has been identified but two times, in 1903 by Needham,⁵ and

¹ A Collecting Trip to Colombia, South America. Miscellaneous Publications, Museum of Zoology, University of Michigan, No. 3, February, 1918.

² I. Two New Interesting Colombian Gomphines (Odonata). Occ. Papers, Museum of Zoology, University of Michigan, No. 52, April, 1918.

³ *Secondes Additions au Synopsis des Gomphines.*

⁴ *Troisiemes Additions au Synopsis des Gomphines.*

⁵ A Geneologic Study of Dragon-fly Wing Venation. Proc. U. S. Nat. Mus., Vol. XXVI, p. 738, fig. 27. Of the specimen which served for the figure, Professor Needham has written me: "Adolph Hempel sent it to me from somewhere in Brazil. It was a fragment of a teneral specimen, rolled up in a ball and unrecognizable. I boiled it and obtained two nearly perfect pairs of wings. The specimen lacked the head and the apex of the abdomen and was in such bad condition that I did not preserve it."

in 1909 by Ris,⁶ though, in the latter case, the species was not described and named till 1913.⁷ De Selys' specimens were females; Needham had a single imperfect male of which only the wings were preserved; and Ris had two females. De Selys' and Needham's material came from Brazil; Ris's specimens were from Argentina.

The fact that no other material which might be referred to *Agriogomphus* has come to light, is evidence of a sort for the correctness of the determinations by Needham and Ris. But this evidence is weak because of the scanty material.

Ris's papers do not state that he had studied de Selys' type, and his reference, in 1913, to the type as a male (it is really two or more females) indicates that he had not studied them. Moreover his failure to comment on the differences shown by his specimens from the type females, as described by de Selys, makes it seem possible that his determination was based on Needham's figure. For there is no question that the specimens studied by Needham and Ris are congeneric, though there are differences in the triangles.

Comparing Needham's and Ris's material with de Selys' description of the genus, a striking difference is detected in the stigmas,—long, covering four to five cells (de Selys)⁸; moderate, covering two and one-half cells (Needham, Ris). The distinctly four-sided triangle of the front wings (Ris)

⁶ Coll. Zool. Selys-Longchamps. Libellulinen. Fasc. IX, p. 10, fig. 1. The wings figured are those of the type described and named in 1913.

⁷ Odonatenfauna von Argentina. Mem. Soc. Ent. Belg., Vol. XXII, pages 55-102.

⁸ Under the description of the species, *Agriogomphus sylvicola*, de Selys says, "la reticulation extremement simple," and under the generic description it is stated that the antenodals of the front wing number twelve. For such an insect to have a stigma covering four to five cells is very remarkable and a misprint might be suspected. But nothing is said of this in his corrections published four years later, and in the specific description he again refers to the long stigma.

and the less distinctly four-sided triangle of both front and hind wings (Needham) are not mentioned by de Selys, and his description of the relative lengths of the sides of the triangles does not correspond with their material, and indicates a narrower winged type. Nor can I see that the sectors of the arculus of their specimens agree well with de Selys' description.

My specimens, twenty-three in number, representing two species congeneric with Needham's and Ris's material, show that within a species the triangles are variable in form, and therefore probably worthless for generic distinctions. Characters of the sectors of the arculus are easily misinterpreted and are not always correctly represented in figures. The character of the stigma therefore offers the greatest difficulty to referring all this material to *Agriogomphus*. For I now know the venation of four species and in all the stigma covers two and one-half cells, while in the type, *Agriogomphus sylvicola*, which I know only from de Selys' description, the stigma covers four to five cells. This is not so remarkable in itself, but in wings with such reduced venation where such a difference exists, other and more significant differences should be expected.

I have written to Dr. Ris asking him to have a photograph made of the venation of de Selys' type. In the chaotic conditions existing a considerable time must elapse before Dr. Ris can have this done, if, fortunately, my letter on the subject ever reaches him.

For the present I am using *Agriogomphus* in the sense in which all authors since de Selys have used it. Whether we are right or not must be determined by a study of de Selys' material at Bruxelles.

Agriogomphus hamatus, new species

Description: Abdomen, male 23.5-24 mm.; female 23-24 mm.; hind wing, male 17.5 mm.; female 19-20 mm.

Male.—Rear of head pale yellow, dark brown about the foramen; face and frons above olive green, labrum with the anterior edge straight, parallel to the base, the free borders margined with yellow, which shades into the green, and a median brown spot; frons above with a median basal triangular brown spot, the apex of which may reach the angle of the frons or only half this distance. Vertex and occiput dark olive green or brown; the surface posterior to the postocellary ridge relatively flat, the occiput occupying a relatively large part of the area; the occiput rounded off posteriorly, without any ridge or keel, and passing, at either end, into the swollen areas back of the eyes; these areas are similar to those of species of *Cyanogomphus* and *Ischnogomphus*, and, like the rear of the occiput, are sparsely covered with bristle-like hairs.

Prothorax pale yellow, the free edges of the front and hind lobes paler; a small median brown spot on the front border; some obscure markings about the suture between the front and middle lobes; similar in shape to that of the female (Pl. I, figs. 7 and 8).

Thorax greenish yellow, marked with black and brown (Pl. I, fig. 1); above and especially towards the median line the pale color on the mesepisternum is pale dull blue; in bright colored specimens the black median area and the black upper part of the dark stripe on either side of it stand out conspicuously in the color pattern; the pale color of the thorax grows brighter and clearer posteriorly; beneath the same shade of greenish yellow, but much paler.

Abdomen with an annulate, and, for a gomphine, intricate color pattern; sides of 1 and 2 same color as metepimeron,

above darker, dorsal markings on 1 obscure and ill defined, 2 with the base pale dull greenish or bluish and a large apical brown spot, covering about three-fourths of the segment, which is more or less distinctly divided longitudinally in the median line; this spot joined on either side by a lateral apical spot, the lower edge of which reaches the upper level of the auricle; auricle high and short, armed on its posterior edge and inner side with a triple or quadruple rowed area of small black spines, numbering about twenty-five; 3 light yellowish brown with a narrow interrupted brown ring at about two-fifths its length and the apical third or less brown; articulations of 4-7 black; 4-6 yellow at base, the apical third of 4, two-fifths of 5 and three-fifths of 6, black, the pale basal area on each with a narrow black ring near its middle; 7 largely yellow or yellowish, a dorsal basal brown spot about one-fourth the length of the segment; the spined apical border black, shading anteriorly into brown which shades out into the pale color of the segment; 8 and 9 black or dark reddish brown with ill-defined lighter brown areas, especially apically; 10 sometimes similar to 8 and 9 but usually lighter, in brighter specimens orange-brown. Base of abdomen of usual form, tapering from the base to about one-fourth the length of 3, from that point of about uniform diameter to about one-fourth the length of 7, from which point the depressed apical segments widen rapidly, the width of 7 at its apex being to the width of the base in the ratio of 9:4; the apex of 8 in the same ratio is 13; this marks the widest point, the abdomen gradually narrowing to the apex of 10 (basal to the long, posteriorly projecting, snout-like dorsum) which in the same ratio is 9. The length of the segments, measured on the side, at mid-height, in terms of the same ratio are as follows: segment 1, 3; segment 2, 9; segment 3, 24; segment 4, 26; seg-

ment 5, 26; segment 6, 24; segment 7, 18; segment 8, 12; segment 9, 8; segment 10, 5 (measured to the apex just at the level of the lower edge of the superior appendage). Height of segment 6 at apex in same ratio, 5; of segments 7, 8, 9 and 10, each 7.

The superior appendages are dull colored, similar to 10. They are small, slightly inflated, flap-like organs. Their attachment by a narrow base to the membrane which encloses the segment within its denticulated posterior margin, proves conclusively their homology with the superior appendages of the Anisoptera. Their form is shown in Pl. I, figs. 3, 4 and 5. The dorsal surface is convex, the ventral surface is subapically concave, with the larger part of the surface convex, abruptly constricted at the relatively narrow base. The inferior appendage is represented by a low broad tubercle, less developed than the two inferior parts of the anal segment.

Femora light bluish gray; first femora black above, the color widest and most dense at apex; second femora with the dark color paler, the basal two-thirds brown, the apex dark brown; third femora with the apical fourth or fifth dark brown, a narrow stripe of lighter brown the length of the femora on the mid-dorsal surface. First femora with a row of brown bristles on the postero-ventral edge (these "edges" are only positions, indicated by various rows of bristles, as the femora on all legs are practically round) anterior to which, on the ventral surface, is a longitudinal row of very small black spines, anterior to which is a row of larger spines, increasing in size from the base to about the middle of the row, beyond which point they are about uniform in size, except the most apical one which is about two or three times as long as its neighbors; basally this row is in the mid-ventral line but it gradually passes forward toward the

apex so the apical spine is just beneath the antero-ventral edge. The second femora have a row of brown bristles on both the antero-ventral and postero-ventral edges, and on the ventral surface are two rows of spines which start basally from a little patch of spines on the apex of the trochanter; in the posterior row the spines are small; in the anterior row they are larger, the highest spines near the middle of the row, decreasing in size basally and apically, except the extreme apical spine, which is slender and is about as high as the spines at the middle of the row; at the base the two rows of spines are narrowly separated and they diverge slightly apically; between the posterior row and the row of brown bristles are scattered minute black spines. Third femora with a row of brown bristles along the apical half of the antero-ventral edge, and another row of closer set similar bristles on the postero-ventral edge, which become more scattered and disappear basally; between these rows, on the ventral surface, are scattered small spines beginning with a small patch on the apex of the trochanter; in the apical third of the femora the spines become less numerous and resolve themselves into two rows which are carried to the apex in a position homologous to the rows on the second femora; the anterior apical spine higher and more slender than the others. Tibiae bright yellow dorsally, black ventrally, a more or less distinct brown line on the anterior surface just dorsal to the bristles on the antero-ventral edge; tibiae roughly semicircular in cross section. Tarsi black, second joint yellow dorsally, dullest and most restricted on first tarsi and brightest and most extensive on the third tarsi; tooth on claw small (Pl. I, fig. 6).

Accessory genitalia of relatively simple form. The first hamule is the same color and apparently the same composition as the side of the segment adjoining it; its low simple form is

shown in Pl. I, fig. 2; the second hamule is yellowish green, the ventrally directed apex black, shading out basally. The anterior part of the seminal vesicle consists of two wide-spreading, short horns, one on either side. The anterior lamina is straight. Segment 1 has a ventral median tuft of bristles.

Female.—Differing from the male as follows: rear of head very light brown. Face and frons above duller, bluish-green, markings less distinct, the median spot on the labrum brown or yellow. Occiput with a small blunt horn or prominence at either end (Pl. I, figs. 9 and 10). Prothorax (Pl. I, figs. 7 and 8), pale colored, very light brown above, almost white on the sides. Thorax light dull blue, markings paler than in the male, dark brown to paler rusty brown, the middorsal dark area and the dark stripe next adjoining it distinctly to scarcely darker than other dark markings, the median dark area and the next adjoining dark stripe sometimes separated dorsally and the latter stripe usually without any connection with the antehumeral stripe, but continued below with the lower part of the stripe, which, in the male, is separated from the upper part; in some specimens the dark lateral areas, posterior to the humeral suture, scarcely evident. Abdomen more robust than in the male, apparently patterned similarly to the male; 1 and 2 largely dull light blue similar to the metepimeron; auricle wanting; about the apical half of 5 and 6 are dark, 10 is similar to 9, with more or less pale yellowish or light brown areas, especially apically and opposite the superior appendages. Appendages brown and short. Vulvar lamina dark brown or black, nearly reaching the apex of 9, with a broad short base and two long branches (Pl. I, fig. 11), which may lie nearly parallel, as in the figure, or may have the apices separated a distance equal to two-fifths the length of the lamina. Probably the latter condition results from ovipositing. In length

of abdominal segments the female is like the male; the tapering from the base is continued to the apex of 3; the diameter of 4-6 in the female is about one-half greater than in the male; as the four apical segments are about the same in both sexes, the widening of these segments is less abrupt and conspicuous in the female. The ventral median tuft of bristles on 1 in the male is very weakly developed in the female. Legs light dull brown, the tibiae the same color as the femora, or, in bright colored specimens, the tibiae colored as in the male; the femora with the dark areas somewhat reduced and paler as compared with the male. The female has the spines of the anterior row on the second and third femora larger than in the male; the first femora in the two sexes are very similar.

Male and Female.—Stigma black or dark brown, normally covering two and one-half cells. Venation black, wings clear, usually yellow tinged basally and more rarely along the costal border to the nodus; in one female smoky tinged throughout about the veins. Antenodals in the front wings, 11; in the hind wings, 9. Postnodals in the front wings, 5 or 6, in about equal numbers, and 7 in one female wing; in the hind wing usually 6 but in one male both hind wings have 5, and in one female both hind wings have 7. The amount of variability in the postnodals as compared with the antenodals is striking. In the front wings the number of cells on the anterior side of Cu_1 , which do not reach M_4 , is 1, rarely 2; and in the hind wing it is 2 in the male, and 2 or 3, in equal numbers, in the female. In the hind wing the number of cells posterior to Cu_2 (=the cells distal to the postanal cells) which do not reach the posterior margin is 1, rarely 2 in the male; and 2 or 3, in equal numbers, in the female.

In the venation of this species the most interesting thing of course is the four-sided triangle. Almost equally interesting is

the amount of variation in the form of this triangle due to the shifting about of the cross-vein between M_4 and Cu , which in the ordinary triangle forms its anterior side. This however is what might be expected. Prior to the formation of the usual three-sided triangle the cross-vein, which forms its anterior side, would have no particular attachment point on M_4 . It might be expected to be as variable as any other cross-vein in an enclosed area. Held posteriorly at the angling of Cu , its anterior end would be free to swing about. If it swung far enough distally a three-sided triangle would result in which none of the enclosure would be formed by M_4 . It might swing basally so that it would be shorter than the portion of M_4 forming the distal part of the anterior side of the triangle, which would now be four-sided. Any position the cross-vein might have between these two extremes would result in a four-sided triangle. The more proximal the attachment of the anterior end of this cross-vein with M_4 , the better developed the four-sided triangle is.⁹

The triangles of the front wings of *hamatus* may be arranged in a series of four groups; I, the distal part of the anterior side (M_4) is about one-half the combined lengths of the distal and proximal (the cross-vein from M_4 to Cu) parts of the anterior side; II, distal part more than two-fifths the combined lengths; III, distal part about two-fifths; and IV, distal part about one-third. Two males are in I; two males and two females in II; one male in III; one female in IV; and one female with one wing in III and another in IV. Thus, in the front wings, no individual varies in itself more than from one group to another. A very different condition is found in the hind wings. Here five groups may be arranged in a series:

⁹ For a fuller discussion see Needham, A Genealogic Study of Dragon-fly Wing Venation. Proc. U. S. Nat. Mus., Vol. XXVI, 1903, pp. 703-764.

I, distal part about two-thirds the combined lengths;¹⁰ II, distal part about one-third; III, distal part about one-fourth; IV, distal part about one-fifth; and V, distal part much less than one-fifth. One male belongs in I and II, another in I and IV, and a female in I and III; one male and one female belong in II, one male belongs in II and IV, another in II and V, and one female belongs in II and III; one female belongs in IV.

The following brief color notes were made from recently killed specimens: Male.—Eyes above bright green shading through bluish to blue gray below. Thorax above black, pale color grayish or bluish green, sides brighter, becoming bright yellowish green below and behind. Abdominal segments 1 and 2 olive, broadly grayish blue at their juncture; 3-6 similar to each other, progressively darker posteriorly, bases greenish, apices black, narrow interrupted ring black or dark brown; 7 largely pale bluish green, almost whitish; 8-9 black; 10 brown, translucent. Female.—Eyes dull green above, dull blue beneath. The dark color of thorax and abdomen is brown and the pale color is gray or bluish gray; segment 7 clearer bluish; 8-10 black.

Habitat: Colombia.

Type: Fundacion, Department Magdalena, Colombia; January 10 and 14, 1917; 13 males and 9 females, collected by J. H. and E. B. Williamson; type male and allotype female, January 10, in the collection of E. B. Williamson.

Habits: I have described elsewhere¹¹ the locality where these specimens were collected. This was a short distance

¹⁰ Note this corresponds with group III in the front wings. In front wings, the four-sided triangle is better developed and is less variable than in the hind wings.

¹¹ A Collecting Trip to Colombia, South America. Miscellaneous Publications, Museum of Zoology, University of Michigan, No. 3, February, 1918.

above the town on the left bank of the Rio Fundacion. The spot was reached by following trails through the woods and not by going up the river directly so I can only roughly estimate the distance at one to two miles. The river banks were clothed with a dense impenetrable growth of Heliconias, bamboos and palms. At the place where the specimens were found the river bank was slightly lower for a short distance and across this low area the river had swept, during some recent high water period, into a large jungle-surrounded lagoon only a short distance from the river. The flow of water left the numerous Heliconias and some smaller plants bent down and there were a few dead tree tops scattered about, but the jungle, elsewhere present, was largely wanting, admitting both light and air, and making it possible for the collector to move about freely. Knowing how productive such locations often prove, we examined it just before noon as we were going up the river, but without detecting any gomphines, though it is not impossible they may have been present. As we returned in the afternoon, we caught our first male along the jungle path near the overflow area. Finding no more along the path, we spent the next hour, from three-thirty to four-thirty p. m., collecting in the open area and succeeded in taking ten more specimens. The afternoon was cloudy without any sunshine. The place was visited a second time four days later at about the same time of day, and the same number of specimens was secured. During our second visit, the day was bright and sunny, but the jungle surrounding the open area threw much of it in shade.

The gomphines were usually resting on twig tips or similar perches from six inches to two and one-half feet high, lower locations being preferred. No difference was detected in the actions of the sexes. They were not wary, but once flushed,

the flight was followed with difficulty and the individual was usually lost. An *Anatya* was flying at the same place and several times in our search one of these libellulines was mistaken for the gomphine, but the error was detected in every case before the *Anatya* was netted. On the other hand no gomphines were ever mistaken for libellulines. Years ago I had a similar experience in Ohio the day I first saw *Celithemis elisa* alive. It was flying among a large number of *Celithemis eponina*. In my anxiety to get a number of the more beautiful and rarer species, I netted by mistake a considerable number of the commoner species. But when a specimen of *elisa* really appeared it was "spotted" at once beyond all question. Today, when I no longer care to catch either, they are readily distinguishable even at a distance.

The proximity of the river and lagoon to the area where we found the adult gomphines left the habitat of the larvae in doubt. In fact we have no assurance that the larvae lived in either, though this was assumed, as careful search at both places yielded no exuviae. Our failure to find them may be explained, however, on other grounds than their absence.

The absence of the male inferior abdominal appendage and the apparently functionless character of the superior appendages, at least as grasping organs, raise the question of the manner of the grasping of the female by the male during copulation. The unusual form of the tenth abdominal segment of the male, and the absence of peculiar modifications of the head and prothorax of the female show at once that this grasping is accomplished in some manner hitherto unknown among Odonata. Dr. Walker has kindly studied a male and female specimen and I quote from his letter: "I soon decided that the hooks of the tenth segment of the male engage either the posterior margin of the prothorax or of the occiput, and I finally

decided the latter was the more probable. In trying to fit the hooks on the hind margin of the prothorax it did not occur to me that the apex of 10 would rest on the dorsum of the head (an opinion I had expressed to Dr. Walker in a letter); I thought it would have to lie behind the head, and I found it was too long for this. If the dorsum of 10 is placed on the prothorax of the female with the hooks behind the posterior margin, the apex of 10 is too low to rest on the head. If the apex is elevated sufficiently to rest on the female's occiput, the dorsum of 10 and the prothorax are widely separated, and the apical dorsum of segment 9 may possibly be closely against the middorsal thorax carina of the female. My idea is that the hooks of 10 engage the occiput of the female, the dorsum of the segment resting on top of the head. This position involves no difficulties in regard to contact between parts of the male abdomen and the thorax of the female, but has the disadvantage that the parts of the female grasped by the male are as fixed as those of the latter. An attempt by the female to free herself by a forward and downward movement of the head could however be resisted by a forward and upward pull of the male abdomen. The occiput of the female is for the most part rounded but at each postero-lateral angle there is a short projecting tooth, separated from the rear of the eye by a notch. These teeth or notches are the right distance apart to be grasped by the hooks of the male, *and they are wholly absent in the male*. This is the chief reason why I incline towards this theory rather than the other one. It does not however account for the snout-like projection of the apex of 10 which seems unnecessarily long for either method, though, according to your plan the long apex might allow a little play of the female's head beneath it without permitting the latter to escape."

My idea as to the method of grasping is indicated in the above quotation. Dr. Walker thinks it more probable that the hooks engage the rear of the occiput. I thought it more probable that they engage the rear border of the prothorax. We arrived at our opinions independently. I think greater weight should be given Dr. Walker's opinion than my own, as he has studied the matter carefully and his experience in the subject is greater than mine. However, it should be noticed that the teeth or projections on the occiput of the female would serve as lateral guards for the snout-like apex of 10 in my plan. If, therefore, as Dr. Walker assumes, their presence in one sex, and not in the other, implies a function, my plan is not weakened by this. As to males of other species in the genus we know nothing, but similar modifications of the tenth segment of the male should be expected. Yet the female of *infans* has no such occipital projections. It is not impossible, however, that the male of *infans*, when discovered, will be found to have some structures developed on the dorsum of the tenth segment for engaging the depressions in the rear of the head of the female.

It seems to me, however, that the weakest point in Dr. Walker's plan is one to which he calls attention—the immobility of the parts involved. The retention of the female by the male under such circumstances would be almost impossible. Moreover the plan leaves the snout-like apex of 10 without any function. My idea was that, in seizing the female, the male would place this apex on the dorsum of her head, pushing the rear of the head down, so the occiput would be brought more in line with the prothorax, and, this accomplished, the hooks would be snapped behind the hind border of the prothorax. The push upward, by the female's head, on the apex of 10 would, I think, securely bind the two sexes together. But

against my plan is the unmodified character of the prothorax, and the fact that such a coupling involves a greater departure from the usual gomphine method than Dr. Walker's plan necessitates.

One female specimen has the head of a bee attached to the left hind tibia. The apex of the tibia is broken off, the mandibles of the bee gripping the tibia firmly near its base. Through the kindness of Mr. Currie this specimen was submitted to Mr. J. C. Crawford of the United States National Museum who reports that "the head is that of one of the stingless honeybees, *Trigona* sp. These bees, of which there are many species in the tropics, are social in their habits, and build nests, combs, etc., and store honey. It is possible that the dragonfly was attacked by the bee when in the vicinity of its nest, but more probably the dragonfly captured the bee which seized its captor by the leg before being dispatched."

Remarks: Two species of *Agriogomphus*, based on female specimens only, are known: *sylvicola* de Selys, and *infans* Ris. The male figured by Needham, referred to in a footnote above, was never named and only the wings are preserved. It is fortunate, in view of the fact that colors and even color patterns become obscure in dried specimens of these gomphines, and that only females have been described, that good venational characters are available for their recognition. *Hamatus* is separated at once from *sylvicola* by the short stigma and the well-developed four-sided triangles. It is also a smaller species than *sylvicola*. In the hind wing the number of cells posterior to Cu_2 which do not reach the posterior margin is one, rarely two, in the male, and two or three in the female of *hamatus*; in Needham's figure (male) there are four, and in Ris's figure (female) there are six. The triangles of *hamatus* are more

conspicuously four-sided; and *infans* and *hamatus* differ in the thoracic color pattern.

Agriogomphus hamatus is the smallest gomphine known; in no other gomphine is the triangle so distinctly four-sided; and it is the only dragonfly in which the male abdominal appendages have become functionless as grasping organs, this function being taken over by unique modifications of the tenth abdominal segment.

Agriogomphus species

Description: Abdomen, female 24 mm.; hind wing, female 20 mm.

Female.—Similar to *hamatus* but separated at once by the form of the occiput. Thoracic dark colors brighter, a rusty brown; the dark stripe on either side of the median dark area joined above to that area, and, a short distance below, broadly joined to the dark antehumeral stripe. Abdominal patterns apparently the same, the dark apices of the segments possibly darker, noticeable especially on 6, where the apex and the base of 7 are black. Vulvar lamina similar to that of *hamatus* but specifically distinct, the branches slenderer, slightly longer, with their outer edges more nearly parallel, meeting the posterior edge of the base at nearly a right angle instead of in a long curve.

Stigma black, covering two and one-half cells (two in one front wing). Venation black, wings clear, yellow tinged basally and anteriorly as far as the nodus. Antenodals in front wings, 10 or 11, in hind wings, 9; postnodals in front wings, 5 or 6; in hind wings, 5. In the front wing the number of cells on the anterior side of Cu_1 , which do not reach M_4 , is 1; and in the hind wing it is 1 or 2 (2 or 3 in females of *hamatus*). In the hind wing the number of cells posterior to Cu_2 , which

do not reach the posterior margin, is 4 (2 or 3 in females of *hamatus*). In the front wings the distal part of the anterior side of the triangle is two-fifths, or a little more, of the combined lengths of the distal and basal parts of the anterior side; in the hind wing it is about one-third (see under *hamatus* for variations of this character in that species).

Habitat: Colombia.

Type Specimen: One female; Cristalina, Department Antioquia, Colombia; February 14, 1917; J. H. and E. B. Williamson, collectors; in the collection of E. B. Williamson.

Remarks: It is certain this female belongs to an undescribed species but to give it a name now is more likely to prove a hindrance than a help to future students. It was captured along the Quebrada Sabaleticus and was supposed at the time to be the same as the species collected a month earlier at Fundacion. A male also was seen along the Rio Diez-y-ses on February 13, but escaped. A hasty search was made at both the Cristalina locations, but no more were seen, and, as we thought it the same as the Fundacion species, and other interesting things were demanding attention, we did not take the time and energy necessary to collect more specimens. Our mistake was detected only during the preparation of this paper.

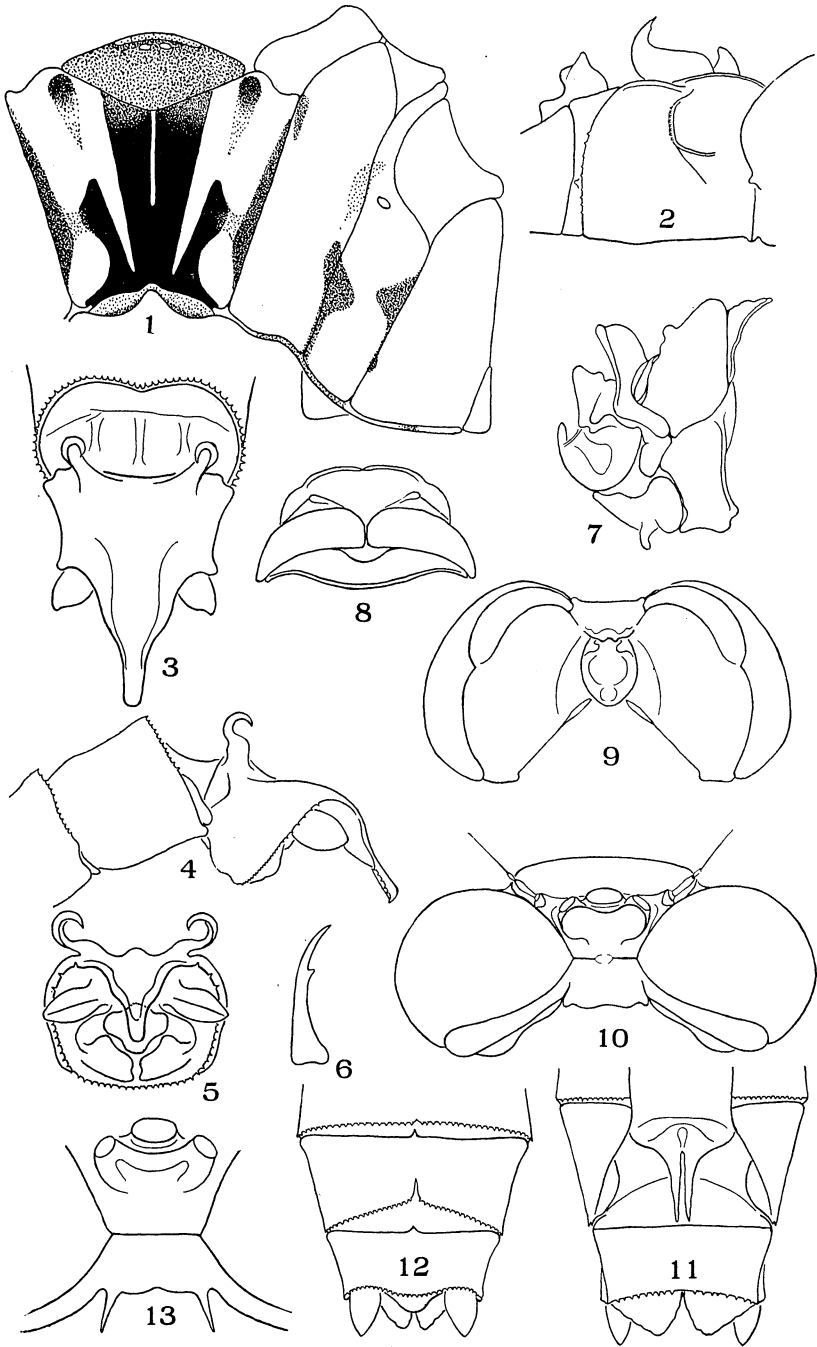
PLATE I

Figure 1, diagrammatic; 9 and 10, magnification; 2-5, 8, and 11-13, more magnified; 7, still more magnified; and 6, the greatest magnification.

Figures 1-6. *Agriogomphus hamatus*, all of the type male. Fig. 1, diagram of thoracic color pattern; 2, abdominal segment 2, with accessory genitalia, left side, in profile; 3, dorsal view of segment 10 and apex of 9; 4, profile of segments 9 and 10; 5, posterior view of segment 10, the inferior appendage partially concealed by the dorsal apex of 10; 6, third tarsal claw.

Figures 7-12. *Agriogomphus hamatus*, female. Fig. 7, left profile of prothorax; 8, dorsal view of prothorax; specimen taken January 14; 9, rear of head; 10, dorsum of head, same specimen; 11, ventral view of abdominal segments 9 and 10 and apex of 8 of allotype female, showing vulvar lamina; 12, dorsal view of same segments as 11; note the normal tenth segment of the female as compared with the male, 3.

Figure 13. *Agriogomphus* species, female, Cristalina, Colombia, February 14, 1917; dorsal view of the occiput and part of the vertex; compare with 10.



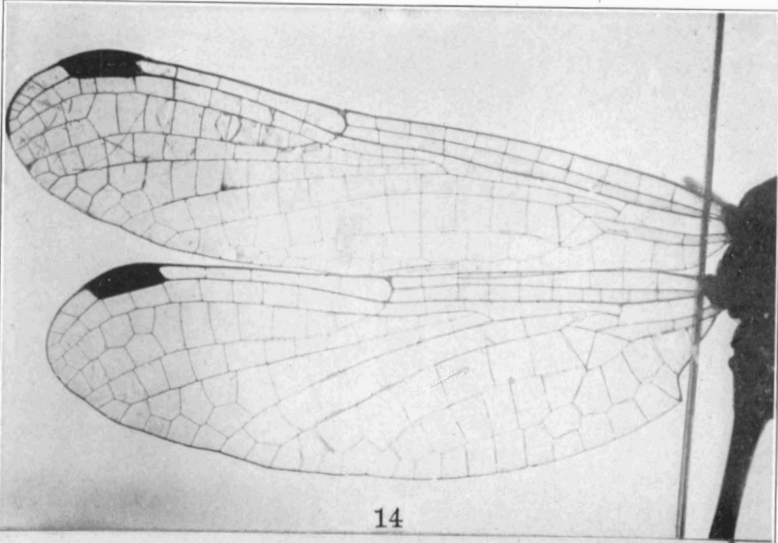
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PLATE II

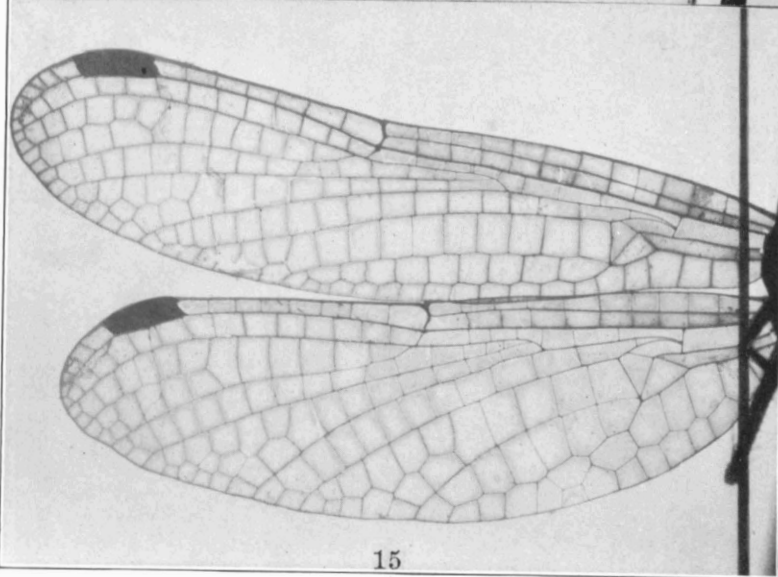
Figure 14. *Agriogomphus hamatus*, male, Fundacion, Colombia,
January 10, 1917.

Figure 15. *Agriogomphus hamatus*, female, Fundacion, Colombia,
January 10, 1917.

From wing photographs by Mr. C. H. Kennedy, Cornell University.



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