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III. ARCHAEOGOMPHUS, A NEW GENUS OF DRAGON-FLIES
(ODONATA)²

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In Occasional Papers of the Museum of Zoology, Number 59, June 24, 1918, I described a new dragonfly which, after some hesitation, was referred to the genus *Agriogomphus*, and the species was named *hamatus*. In that paper, page 3, I referred to the fact that I had written to Dr. Ris to have a photograph made of de Selys' type, if this were possible. Fortunately through the kindness of Mons. Severin and Dr. Ris I now have this photograph, and it is evident at once that the *Agriogomphus* of Needham, Ris and myself, has nothing

¹ A Collecting Trip to Colombia, South America, Misc. Publ. Mus. of Zool., Univ. of Mich., No. 3, February, 1918.

² I, Occ. Papers, Mus. of Zool. No. 52; II, *l. c.*, No. 59

to do with the true *Agriogomphus* of de Selys. The species referred to *Agriogomphus* by the three later authors above mentioned belong to an undescribed genus which I propose describing in this paper under the name ARCHAEOGOMPHUS, new genus, type *Agriogomphus hamatus* Williamson.

Archaeogomphus, new genus

Belonging to that group of genera (not necessarily closely related, *inter se*) of the legion Gomphus which possesses numerous unspecialized cross-veins between M_{1-3} and M_4 . The distribution of characters within the group and the artificial key to the genera which I have previously published³ should be revised, since *Agriogomphus* as used in that paper is really *Archaeogomphus*, and the characters of the true *Agriogomphus* are not included therein.

Distribution of Characters Within the Group

1. Stigma with a weak brace-vein: *Agriogomphus*, *Cyanogomphus*, *Ischnogomphus*.
- 1a. Stigma without a brace-vein: *Archaeogomphus*, *Epigomphus*, *Leptogomphus*, *Macrogomphus*, *Microgomphus*.
2. Basal antenodal of second series present: *Agriogomphus*, *Cyanogomphus*, *Epigomphus*, *Ischnogomphus*, *Leptogomphus*, *Macrogomphus*.
- 2a. Basal antenodal of second series not present: *Archaeogomphus*, *Leptogomphus*, *Microgomphus*.
3. Distal thickened antenodal the fifth: *Archaeogomphus*, *Agriogomphus*, *Cyanogomphus*, *Ischnogomphus*, *Microgomphus*.

³ Occasional Papers of the Museum of Zoology, University of Michigan, Number 52, April 17, 1918.

- 3a. Distal thickened antenodal the sixth or more distal:
Epigomphus, Leptogomphus, Macrogomphus.
4. One cubito-anal cross-vein in addition to the inner side of the subtriangle: *Archaeogomphus, Agriogomphus, Cyanogomphus, Ischnogomphus, Leptogomphus, Macrogomphus, Microgomphus.*
- 4a. Two cubito-anal cross-veins in addition to the inner side of the subtriangle: *Agriogomphus, Epigomphus, Macrogomphus, Microgomphus.*
5. One row of postrigonal cells in the front wings: *Archaeogomphus, Agriogomphus.*
- 5a. Two rows of postrigonal cells in the front wings: *Cyanogomphus, Epigomphus, Ischnogomphus, Leptogomphus, Macrogomphus, Microgomphus.*
6. One row of postrigonal cells in the hind wings: *Archaeogomphus, Agriogomphus, Cyanogomphus, Epigomphus.*
- 6a. Two rows of postrigonal cells in the hind wings: *Cyanogomphus, Epigomphus, Ischnogomphus, Leptogomphus, Macrogomphus, Microgomphus.*
7. Anal area of the front wings one cell wide: *Archaeogomphus, Agriogomphus, Ischnogomphus, Microgomphus.*
- 7a. Anal area of the front wings two or more cells wide: *Cyanogomphus, Epigomphus, Leptogomphus, Macrogomphus.*
8. Two postanal cells in the hind wings: *Archaeogomphus, Agriogomphus, Cyanogomphus, Ischnogomphus, Microgomphus.*
- 8a. Three postanal cells in the hind wings: *Cyanogomphus, Epigomphus, Leptogomphus.*
- 8b. Four postanal cells in the hind wings: *Leptogomphus, Macrogomphus.*

9. Anal area in the hind wings, distal to the postanal cells, two cells wide: *Archaeogomphus*, *Agriogomphus*, *Cyanogomphus*, *Ischnogomphus*, *Microgomphas*.
- 9a. Anal area in the hind wings, distal to the postanal cells, three cells wide: *Epigomphus*, *Cyanogomphus*, *Leptogomphus*.
- 9b. Anal area in the hind wings, distal to the postanal cells, four or more cells wide: *Macrogomphus*.
10. Anal triangle present in the male: *Cyanogomphus*, *Leptogomphus*, *Macrogomphus*.
- 10a. Anal triangle not present in the male: *Archaeogomphus*, *Epigomphus*, *Ischnogomphus*, *Microgomphas*.
- 10b. Male not known: *Agriogomphus*.

An Artificial Key to the Genera of the Group

- a. Basal antenodal of second series not present.
- b. One row of postrigonal cells in the front wings.
 *Archaeogomphus*.
- bb. Two rows of postrigonal cells in the front wings.
- c. Anal area in the front wings one cell wide, in the hind wings two cells wide. *Microgomphas*.
- cc. Anal area in the front wings two or more cells wide, in the hind wings three cells wide. . *Leptogomphus*.
- aa. Basal antenodal of second series present.
- b. Anal area in the front wings one cell wide.
- c. One row of postrigonal cells in both front and hind wings *Agriogomphus*.
- cc. Two rows of postrigonal cells in both front and hind wings *Ischnogomphus*.
- bb. Anal area in the front wings two or more cells wide.
- c. Distal thickened antenodal the fifth. *Cyanogomphus*.
- cc. Distal thickened antenodal the sixth or more distal.

- d. Anal area in the hind wings three cells wide.
- e. One cubito-anal cross-vein in addition to the inner side of the subtriangle... *Leptogomphus*.
- ee. Two cubito-anal cross-veins in addition to the inner side of the subtriangle.... *Epigomphus*.
- dd. Anal area in the hind wings four or more cells wide *Macrogomphus*.

Archaeogomphus is an isolated type without apparent relationships. The strikingly unsymmetrical forking of M_{1-2} and M_3 , which occurs also in *Leptogomphus* and *Microgomphus* of the Oriental fauna and *Epigomphus* of the Neotropical, is found scarcely or not at all in other genera of the legion Gomphus, a symmetrical or nearly symmetrical forking being the rule. The male of the type species, *hamatus*, is unique in the form of the tenth abdominal segment; this has the dorsum armed basally on either side with a strong interno-posteriorly directed hook and produced apically in a long snout-like projection which is more than twice as long as the rudimentary, flap-like, superior appendages; the inferior appendage is still more rudimentary, and these appendages have no function as grasping organs. *Agriogomphus infans* Ris is an Archaeogomphus; and Needham's figure 27, in A Geneologic Study of Dragon-fly Wing Venation, is of an undescribed species of the same genus.

The venation of *Archaeogomphus hamatus* is figured in my paper describing the species (Occ. Papers of the Mus. of Zool., No. 59). In that paper on page 11, first line, for *two-thirds* read *two-fifths*; and in the explanation of Plate I, first line, insert *lowest* after *10* and before *magnification*.

Agriogomphus is closely related to Cyanogomphus and Ischnogomphus, from both of which it is separated at once by

the more reduced venation. In the photograph of the wings (Plate I) there is a single cubito-anal cross-vein in addition to the inner side of the subtriangle in the right wings, but in the left wings there are distinctly two in the hind wings, and probably two in the front wings.

PLATE I

Figure 1. Wing photograph of *Agriogomphus sylvicola* Selys, one of the two females on which the descriptions of both genus and species were based. Through the kindness of Mons. Severin, who made the photograph at the request of Dr. Ris, the following data are available: The two specimens of this species are under a green label written by de Selys "*Agriogomphus sylvicola* Bates." The specimen photographed has a small white label "St. Paula" in an unknown hand, and a larger white label "*Agriogomphus sylvicola* Bates, female" in de Selys' hand.

~~PLATE II~~

Figure 2. Male accessory genitalia of *Archaeogomphus hamatus*, Fundacion, Colombia, January 10, 1917.

The striking characteristics of the penis are its relatively weak chitinization, and its great complexity, especially of the second segment. The ventral process or spur of this segment is, in *Archaeogomphus hamatus*, like a broad shovel, being fully as wide as the wide second segment. Its attachment to the second segment is in the shape of a low capital T, the cross of the T being basal. The apex and the three borders of the broad spur are well chitinized but the enclosed parts are progressively less chitinized toward the point of attachment, so only the extremities of the T-shaped base are well chitinized, the foot of the stem of the T (the apical extremity of the attachment) being most strongly chitinized. On either side of the stem of the T and almost parallel to it (slightly divergent) there is a thin expanded membrane, like a curtain, triangular in shape, attached to the second segment, with the distal edge free.

The distal median portion of the second segment is not chitinized, being a membranous expansion between the chitinized basal and lateral areas. From this membranous floor on either side rises a thin blade-like chitinized process or spine. The segment is terminated on the same surface by two thin curved chitinized flaps, joined and more or less margined with the usual thin membrane.

The dorsal and ventral basal surfaces of the third segment have each a similar thin membranous extension, which in each case has a free distal edge.

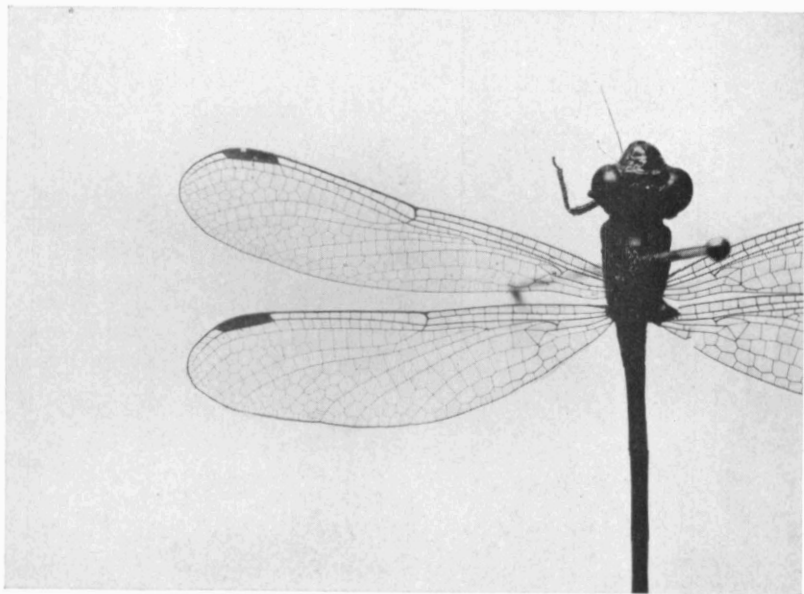


Figure 1

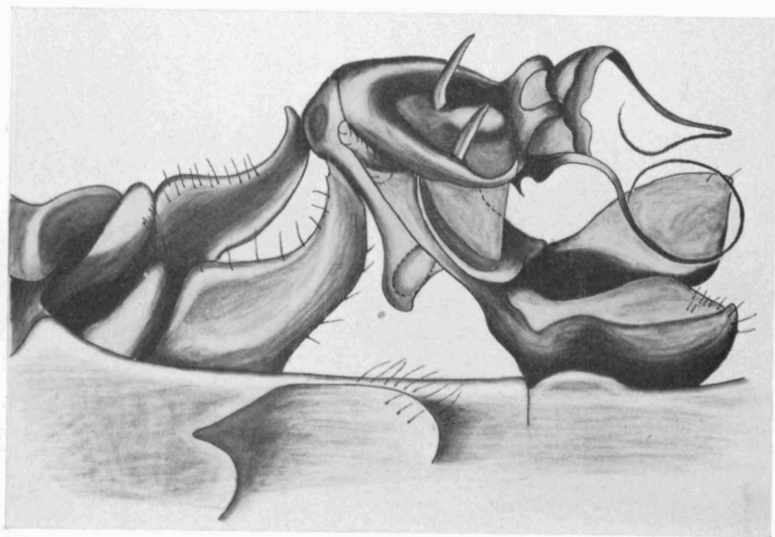


Figure 2

