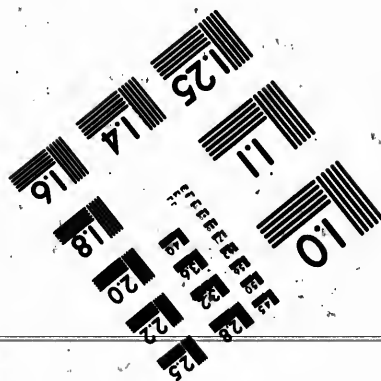
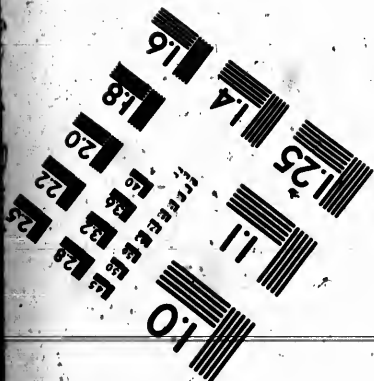
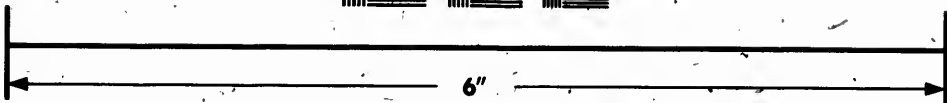
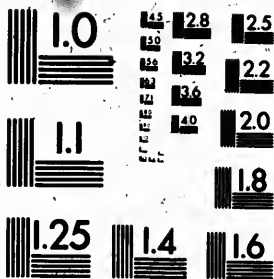


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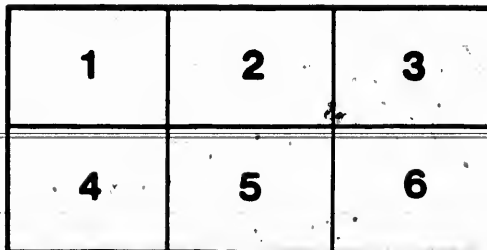
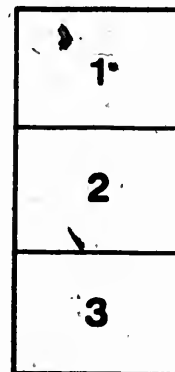
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*2nd Zoological Investigation
of the Province of Ontario*

MATERIALS
FOR A
FAUNA CANADENSIS.

BY WILLIAM HINCKS, F.L.S., B.S.E.,

HON. MEMB. LIV. LIT. AND PHIL. SOC., YORKSHIRE PHIL. SOC., AND BOT. SOC. OF CANADA;
CORR. MEMB. OF THE ESSEX CO. INST.; PROF. NAT. HIST., UNIV. COLL., TORONTO.

[From the *Canadian Journal* for September, 1862.]



THE difficulties attending the study of every branch of Natural History in Canada, are greatly aggravated by the want of books fitted to afford to the student, in a convenient and scientific form, such assistance as the present state of our knowledge renders practicable. A lover of Nature, who applies himself to any special department in his own locality, may collect specimens, but they will afford him very little satisfaction unless named and arranged; to which end he must have a good system, and must have characters of the received genera and known species, so that he can ascertain the history of the object he finds, if known; and if he is so fortunate as to meet with anything new, may have the means of knowing it to be so, that he may communicate his observations upon it without fear of merely repeating what others have done, and perhaps creating useless names, which encumber the science he wishes to advance. To a beginner in the study of Nature, nothing can be more discouraging than to have to search out every object in the most extensive general works (provided he is so fortunate as to have access to them) because there is as yet no attempt at a list of the productions of his country, where the limited number would facilitate his investigations.

Those who contribute local catalogues in any department of Natural History, render important assistance: but something more is required. It has occurred to me that the publication in this Journal of fragmentary portions of a *provisional* Fauna Canadensis might contribute not a little both to assist the cultivators of Zoological Science and to accumulate useful materials for future labourers who may be enabled to attempt what would now be premature,—a general systematic work on Canadian Zoology. By a provisional Fauna, we mean a systematic arrangement with the essential characters of all such genera and species as have either, to our knowledge, actually been found in Canada, or are deemed very likely to be found there—being known as inhabitants either of the more northern or the immediately southern regions. In this way, without pretending to be yet in a condition to offer any reliable account of all the living creatures inhabiting our country, we may afford useful assistance to those who are disposed to examine them, and by their labours thus assisted our conjectural list will gradually change into an authenticated record of observed facts. Many, who without such aid could do nothing, or would remain insulated collectors, unable to determine whether what they obtained was known or unknown, scarce or familiar, would be at once enabled, with a great increase to their own enjoyment from the

study of Nature, to become contributors to scientific knowledge ;—to assist in determining the range of species, and to call attention to hitherto undescribed forms.

There may be branches of Natural History in which the advances already made, as well as the extent and general interest of the subjects, would warrant the publication of volumes specially dedicated to their illustration. I have already announced my desire, restrained only by necessary considerations of prudence, of publishing from materials now in my hands, a *Flora Canadensis*, the utility of which I think cannot be doubtful ; though no one can be more conscious than I am how much remains to be done in the way of diligent herborisation throughout all parts of the Province, and it is in promoting this interesting labour, that I think the work I propose would be especially useful. The birds which annually visit us are beginning to be well known. We have public and private museums of considerable richness. A French-Canadian gentleman—M. Lemaire—has published in his own language, a good popular account of them, which has met with well-deserved success ; and we know that he has proposed to our highly-valued friend, T. W. Cottle, Esq., of Woodstock,—whom nobody excels in a familiar practical acquaintance with the birds of Canada,—to translate his work into English, with such modifications as his own judgment might suggest ; thus producing an Ornithological manual for Canadians using the English language, which could not fail of giving a great impulse to this attractive branch of Zoology. Even our own means, from the extensive collection of the University, aided by local catalogues and occasional notices, would enable us to do much in relation to the birds of Canada, and we may possibly attempt a sketch of their arrangement ; but for particulars respecting species, their distinctions, and their habits, we should gladly come as learners to such an authority as we have named, and we earnestly hope that he will be induced to engage in the undertaking we have referred to. We could easily name a friend who possesses admirable materials for working out several of the more difficult orders of Canadian Insecta ; and there are not wanting considerable materials for the illustration of the land and fresh-water Mollusca. How far it may seem expedient to proceed with these papers we cannot yet judge ; but the following fragment, relating to Neuropterous Insects will at least shew what we propose, and what means are at our disposal for working out our plan.

The great class *Insecta*, includes articulate animals with jointed

Annulata, as well as the lower form *Rotifera*. Thus defined, the class includes a lower sub-class termed *Myriapoda*, with limbs to each articulation, and whose development is not much beyond that of the larval forms of the higher division; together with the true, or *Hexapodous insecta*, having the lower appendages developed on three articulations only, and the upper, assuming the form of wings, if at all, on two articulations only. The *Apterous* examples will probably appear more certainly the more their structure is understood to be degraded forms of some of the other divisions. It is at least certain that the different groups of *Apterous* insects differ more from each other than they do from some of what are considered as higher forms, whilst there are various special instances of the absence of wings in species obviously allied to others which are furnished with them; so that on the whole, the distinction of winged and wingless insects is of little value, and the *Apterous* orders commonly received might probably be appended to others of which they are but less developed examples. The degree of importance really belonging to some other of the characters relied upon in classifying insects, is very doubtful. One much employed is the mandibulate or suctorial character of the oral apparatus, yet it has been proved that the same elements occur in both structures, and the transitions from one to the other are most remarkable. We cannot think that either the abortive hind wings of the *Diptera*; or their more completely suctorial mouth, should prevent the recognition of their close affinity with *Hymenoptera*, and we incline to the opinion that these two orders, the most peculiarly typical of all insects, would, combined together, occupy a central position in a natural distribution, around which the other leading forms might be placed in the order of their tendencies of development: 1. *Neuroptera*; 2. *Lepidoptera*; 3. *Coleoptera*; 4. *Orthoptera*; 5. *Hemiptera*. Confining our attention now to the *Neuroptera*, it seems to us, in the first place, abundantly evident that the Caddis-flies, which have been elevated into a distinct order under the name of *Trichoptera*, only exhibit a modification of the *Neuropterous* structure in analogy with *Lepidoptera*. Reviewing, then, the various sections which have been proposed, we are inclined to the following view of the families of *Neuroptera*. We place first *Libellulida*, the Dragon-flies, as exhibiting the greatest power and ferocity; 2. *Phryganeida*, the Caddis-flies; 3. *Termitida*, the White Ants, distinguished by their social habits and their large consumption of food, obtained without violence; 4. *Panorlimbs*; a distinct head, with two antennae; respiration by tracheae; and distinct sexes. It is obvious that these characters exclude, on the one hand, *Arachnida*; on the other, all grades of *Crustacea* and

pida, the Planipennes of authors, including several well-marked sub-families; and, 5. *Ephemerida*, May-flies, in some respects having the lowest organisation in the order, yet approaching the *Libellulida* in their imperfect metamorphosis, as well as in the character of their antennae.

We now proceed to give a synopsis of Canadian *Neuroptera*. The following table will distinguish the families:

ORDER NEUROPTERA: Wings four, nearly equal, membranous, usually reticulate, rarely suppressed; mouth more or less completely mandibulate; never properly suctorial; larva hexopod. Antennae.

long, variously-formed	very short setiform, with not more than six or seven joints	
Insects	Mouth	
living in families containing many individuals with undeveloped sex; wings caducous	with its parts hard and distinct, properly mandibulate and indistinct	
not living in families; wings not caducous	with its parts soft	
Wings	Wings	
unequal; the lower layer folded	generally of equal size; the under sometimes smaller, or differing in shape; not folded	
3. <i>Zygoptera</i> .	1. <i>Libellulida</i> .	5. <i>Ephemerida</i> .
	4. <i>Panorpida</i> .	
	2. <i>Phryganetida</i> .	

The curious and interesting family of *Termitida*, which in this group represents the Ants among the *Hymenoptera*, may be omitted, as being confined to tropical and sub-tropical climates. Taking the others in order, we give the following analysis of *Libellulida*, adopting Rambur's sub-families :

Lateral lobes of the under lip (labial palps)	{	of three pieces or joints	Eyes	{	widely separated; sometimes pedicellated	<i>Agrionina.</i>	
					scarcely touching, or separate	touching at a point, or a little separated	<i>Gomphina.</i>
					contiguous, to some extent	.....	<i>Aeschnina.</i>
		of two joints	.....	.....	.....	<i>Libellulina.</i>	

In characterising the genera, we have not thought it necessary to preserve all Hagen's new genera, but have adopted those of Rambur.

Genera of <i>Limulocera</i> triangle of the anterior wings	{	well distinguished from the other areolae, its base formed by a single nervule	Eyes	{	swelled like a grain	<i>Didymops.</i>	
					with a protrusion in the middle posteriorly	not swelled (body brassy-green)	<i>Corduli.</i>
					without the posterior enlargement, connected in a short space	.....	<i>Libellula.</i>
		imperfectly distinguished, its base formed by two nervules	.....	.....	.....	<i>Nannophya.</i>	

Genera of AESCHNINA.

Anal angle of the posterior wings of the male rounded off; second abdominal segment of female not auriculated (abdomen with a lateral interrupted carina)..... *Anax.*

Anal angle of the posterior wings of the male acute; second abdominal segment of the female auriculated; last segment not spinous beneath..... *Aeschna.*

Last segment of the female spinous beneath, otherwise like *Aeschna* *Gynacantha*

Genera of GOMPHINA.

It is only necessary to notice the two following, out of seven genera characterised by Rambur, as being alone likely to afford any species to the Canadian naturalist :

- Under legs entire; triangle without nervules; eyes separated *Gomphus*.
 Under lip divided at its extremity; eyes slightly touching *Cordulegaster*

Genera of AGRIONINA.

Out of eleven given by Rambur, only three seem likely to occur to the Canadian collector, which may be thus distinguished:

Nervules of the first Costal division	}	more or less numerous; pterostigma very small, or only seen in females	<i>Ca lopteryx</i> .	
		two only	pterostigma lozenge-shaped, small; insects of small size; areolæ quadrangular	<i>Agrion</i> .
			pterostigma parallelogram-shaped; areolæ often pentagonal	<i>Lestes</i> .

SYNOPSIS OF THE SPECIES.

LIBELLULIDA.

§1 LIBELLULINA.

Gen. NANNOPHYA. *Rambur*.

N. BELLA, *Uhler*.—Black; front white, with a quadrangular black spot; dorsum of the thorax, each side with an interrupted yellow line on the male; sides with two oblique stripes and a triangular patch behind, interrupted, yellow; abdomen black, with yellow bands and spots—these parts in the female black, pruinose; wings hyaline, fulvous at the base in the male. Pterostigma small, black, terminated with a white nervule at each end in the female: length 18 millimeters; alar expansion 33 mill: rather less in the female.

Hab.: U. S. as far north as Maine.

Gen. LIBELLULA, *Linn.* (as limited by *Rambur*.)*a. Perithemis, Hagen.**L. DOMITIA, Drury.* (*Perithemis Domitia, Hagen*.)

Posterior lobe of the prothorax large, broad, bilobed; abdomen much shorter than the wings, broad, depressed, narrower at the base; flavescent, villose; dorsum of the abdomen with an interrupted brownish-black line on each side; wings flavescent, or at least the basal half, with two fuscous, transverse stripes, the internal one often almost absent in the female; pterostigma rufo-fuscous. In the North-

ern var: the sides of the thorax fuscous with two interrupted yellow lines on each side; all the wings of the male with a basal fuscous point. Length 23 millim.; alar expanse 36 millim.; pterostigma 2 millim.

Hab.: U. S. as far north as the States of N. Y. and Mass.

b. *Diplax, Charpentier*. Posterior lobe of the prothorax large, broad, bilobed; abdomen a little shorter than the wings, slender, triquetral, compressed at the base; feet long, slender; first sector of triangle sinuated; triangle moderate, broad.

L. HUDSONICA, Selys. Very near to the European *D. dubia* (which is thus described: *L. dubia*, black; front white, labium black, labrum white, margined with black; vertex and band before the eyes black; thorax obscure brassy-green, with brown villosity; dorsum with a subinterrupted fulvous stripe on each side; sides spotted with fulvous; feet black; abdomen slender, triquetral, the dorsum spotted with yellow; wings hyaline or fumose, anterior pair with two basal points, posterior with a point and a triangular spot at the base, black; pterostigma quadrangular; nigro-fuscous. Length 37 millim.; alar expanse 58 millim.; pterostigma 2 millim.

Hudsonica is smaller; the basal spot of the posterior wings small; the vertex yellow above; the labrum scarcely margined with black. Length 27 millim.; alar expanse 46 millim.

Hab.: Hudson's Bay, New Brunswick.

L. INTACTA.—DIPLAX INTACTA, Hagen.

Fuscous; mouth and front white; labium of adult male all black, of fem. black in the middle; front with a black band before the eyes; vertex black, with a pale spot, or all black; thorax nigro-fuscous; dorsum with obsolete fulvous stripe on each side; sides fuscous, varied with black; thorax of adult male brassy-black; abdomen short, somewhat broader before the apex; fuscous, with dorsal phalarate fulvous spots: in the adult male black, with a yellowish spot on 7th segment; wings hyaline, posterior ones at the base with a triangular black spot; base flavescens in the females; pterostigma short, quadrangular, black. Length 32 millim.; alar expansion 52 millim.; pterostigma 2 millim.

Hab.: U. S. Wisconsin, Chicago, Mass.

L. RUBICUNDULA, Say.—*DIPLAX RUB.*, Hagen.

Yellowish subrufescent; front yellowish, with a black band before the eyes; thorax rufous, the sides sometimes luteous; feet black; anterior femora luteous beneath; abdomen rather long, slender, sanguineous in the male, or yellowish rufous; the sides with a maculose black stripe; wings hyaline, the extreme base yellowish; pterostigma quadrangular fuscous, pale at each end. Length 32-37 millim.; alar expanse 50-58 millim.; pterostigma 2 millim.

Hab.: U. S. Mass., &c.

L. ASSIMILATA, Uhler.—*DIPLAX ASS.*, Hagen.

Yellowish; mouth and front pale yellow, a narrow black band before the eyes; dorsum of the thorax luteous, its sides yellow; abdomen slender, the base compressed, inflated, yellowish; dorsum of first and second segments black at the base; segments 4-9 each side, with a marginal black stripe; wings hyaline, the base flavescent; males with the basal half flavescent; pterostigma short, yellow. Length 33-37 millim.; alar expanse 56-60 millim.; pterostigma $2\frac{1}{2}$ millim.

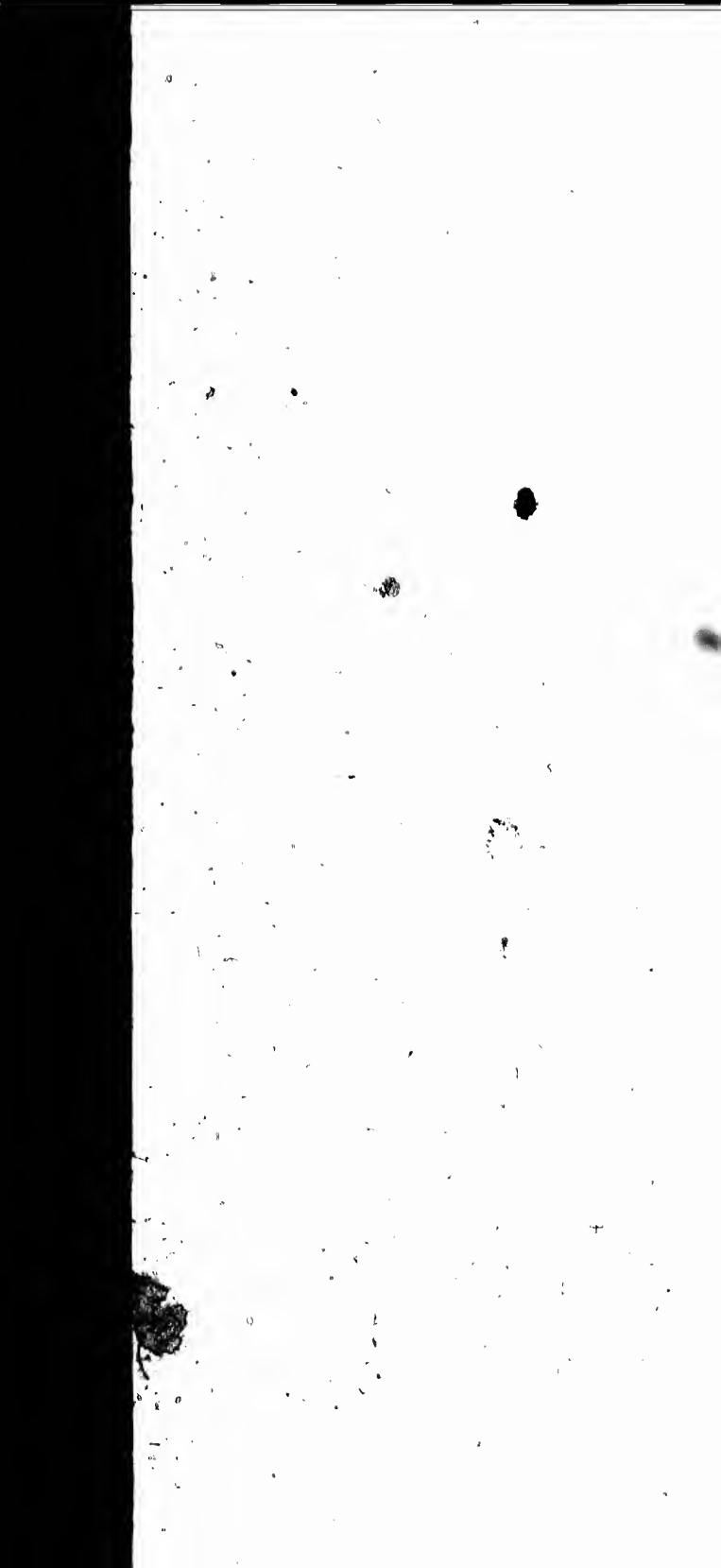
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c. Mesothemis, Hagen.—Posterior lobe of prothorax large, broad, bilobed; abdomen a little shorter than the wings, narrow, triquetral, the base compressed, somewhat expanded before the apex; feet long, rather strong; first sector of triangle sinuated; triangle moderate narrow; sides of eighth segment of the female not dilated.

L. SIMPLICICOLLIS, Say.—*MESOTHEMIS SIMPLICICOLLIS*, Hagen.

Yellowish-green; mouth and front yellowish; a narrow black band before the eyes; thorax yellowish green, the sides varied with black below; abdomen compressed at the base, vesiculose, triquetral, yellowish-green, the sutures and margins black; segments 4-10, with a quadrangular black dorsal spot behind; last segments sometimes altogether black; venter obscure; appendages yellow; feet black, anterior femora yellowish beneath; wings hyaline; pterostigma oblong, yellow. Adult male with the thorax and abdomen blue pruinose. Length 41-45 millim.; alar expansion 60-70 millim.; pterostigma $3\frac{1}{4}$ millim.

Hab.: U. S. as far north as Illinois, Pennsylvania, N. Y., Mass.



- d. *Libellula, Hagen*.—Posterior lobe of prothorax small, entire; abdomen stout, rotundo-triquetral, narrowing posteriorly; triangle narrow, long, first sector sinuated.

L. QUADRIMACULATA, *Linn.*

Reddish yellow, villose; front pale, terminated with black; sides of thorax yellow, lineated with black; feet black; abdomen attenuated at the apex; fuscous behind; sides yellow; wings yellow at the base anteriorly; a costal spot, and sometimes an apical one; posterior wings with a triangular spot at the base, reddish black, veined with yellow; pterostigma brownish black. Length 48 millim.; alar expanse 80 millim.; pterostigma 4 millim.

Hab.: Northern U. S.; Canada.

- e. *Plathemis, Hagen*.—Posterior lobe of prothorax small, entire; abdomen short, broad, depressed; legs stout, short; pterostigma long, oblong; front sector of triangle sinuated; triangle narrow, long; eighth segment in the female dilated at the sides.

L. TRIMACULATA, *De Geer*.—PLATHEMIS TRIMAC. *Hagen*.

Rufescent; thorax with two oblique yellowish stripes at each side; abdomen of the male pruinose; female with lateral oblique yellow spots, margined with fuscous; feet black; base of the femora rufescent; wings hyaline, a basal, longitudinal stripe, which is margined inferiorly with lacteons on the posterior wings and a broad band in the middle, in the male; or with the basal stripes a spot upon the middle anteriorly, and the apex fuscous in the female; pterostigma fuscous. Length 40 millim.; alar expanse 70 millim.; pterostigma 5 millim.

Hab.: U. S. widely diffused, reaching to Maine and Minnesota.

CORDULIA, *Leach*.

C. SEPTENTRIONALIS, *Hagen*.

Brassy-green, hairy; labium luteous; front brassy-green above, each side with a yellow spot; vertex brassy-green; thorax brassy-green, the dorsum having a spot at each side at the wings, and the sides each two maculose stripes, yellow; feet black, anterior femora yellowish at the base; abdomen slender, behind the base inflated; then attenuated, with the apex equal, brassy-black, sides of the base and apex luteous; wings hyaline, the posterior ones with a small basal triangular brownish-black spot; pterostigma small, fulvous; anal

angle in the males subacute. Length 43 millim.; alar expanse 60 millim.; pterostigma $2\frac{1}{2}$ millim.

Hab.: Labrador.

C. ALBICINCTA, *Hagen*.

Brassy-green, hairy; labium luteous, front inferiorly, and at the sides luteous, above and the vertex brassy-green; thorax bright green-brassy; feet black; abdomen slender, inflated at the base, then slenderer, the apex equal, brassy-black, the base on each side and the last segment at the apex being luteous; wings hyaline, anterior margin in the females subflavescent; pterostigma fulvous; anal angle of the males subacute. Length 48 millim., alar expanse 66 millim.; pterostigma 3 millim.

Hab.: Labrador.

Several other species have been attributed to Canada and Nova Scotia, but their characters are not given.

Subf. *AESCHNINA*.

AESCHNA, *Fabricius*.

A. HEROS, *Fabr.*

Fuscous, marked with yellowish-green; front obscure luteous, fuscous above, each side with a yellowish green spot; occiput of the female bifid; thorax fuscous, with a stripe at each side of the dorsum; angulated at the wings, and the sides with two oblique stripes, green; feet black, base of the femora subrufous; abdomen long, stout, hardly broader at the base, fuscous, the base, middle, and apex of the segments with a subinterrupted, narrow, green fascia; wings hyaline, subflavescent in the middle, the apex sometimes infuscated; pterostigma long, narrow, fulvous. Length 85-96 millim.; alar expanse 108-120 millim.; pterostigma 5-6 millim.

Hab.: U. S. Indiana, N. Y. Mass. and Southward.

A. CONSTRICTA, *Say*.

Brownish-black, spotted with green and blue; labrum yellow; head yellowish-green in front, with a black T spot above; thorax fuscous, dorsum with a stripe on each side, which is broader at the wings, the sides each with two oblique green stripes; feet black, femora and tibiae above rufous; abdomen long, equal, blackish fuscous, very much narrowed behind the inflated base; segments 3-10, with two dorsal, apical, quadrangular blue spots, 3-8 with two medial triangular yellow

low spots, each side with a basal divided blue spot; second segment with a basal dorsal line, each side with a transverse line upon the middle, yellow, the last segment flat above; wings hyaline, pterostigma small, fuscous. Length 70 millim.; alar expanse 96-100 millim.; pterostigma 3 millim.

Hab.: U. S. Wisconsin, Indiana, Pennsylvania, Connecticut.

Subf. GOMPHINA.

CORDULEGASTER, *Leach.*

O. OBLIQUUS, Selys.—*Æ. OBLIQUA, Say.*

Black, spotted with greenish yellow; head yellow, with two black bands in front, occiput tuberculoid; thorax black with grey hairs, dorsum with a cuneiform stripe on each side, sides each with two oblique yellow stripes; feet black, base of the femora fuscous; abdomen long, equal, black, dorsum with a greenish-yellow central line, which is dilated in the middle on segments 5-8; wings hyaline, pterostigma long, fulvous. Length 83-88 millim.; alar expanse 112-124 millim.; pterostigma 6 millim.

Hab.: U. S. Indiana, Connecticut, and Southward.

GOMPHUS, *Leach.*

G. PARVULUS, Selys.

Black; head black, a fascia in front and two yellow spots; thorax black, dorsum with a small yellow line on each side; sides yellow, with two contiguous stripes and a third posterior, black; feet black; abdomen equal, black, the dorsum with a basal maculose yellow stripe; wings hyaline; pterostigma blackish, fuscous. Length 40 millim.; alar expanse 54 millim.; pterostigma 3 millim.

Hab.: Nova Scotia.

G. SPICATUS, Hagen.

Fuscous spotted with luteous; head pale yellow; thorax clothed with fuscous hairs, dorsum with a stripe on each side, and the sides with two stripes, luteous; femora luteous, fuscous above; tibiae blackish fuscous, exteriorly yellowish, tarsi black; abdomen equal, inflated at the base, fuscous, the dorsum with an interrupted yellow line, the base with a yellow stripe at each side; wings hyaline, pterostigma yellow. Length 49 millim.; alar expanse 60 millim.; pterostigma 3 millim.

Hab.: N. Y., Canada.

G. COLUBRINUS, *Hagen*.—OPHIOGOMPHUS, COL., *Selys*.

Greenish-yellow; head yellow, with four black lines, labium black in the middle; thorax greenish-yellow, a middle stripe, and one on each side, narrow fuscous; sides each with three narrow black lines; feet yellow, the posterior femora exteriorly fuscous; tibiae black, with an exterior yellow line; abdomen cylindrical, dilated before the apex, the dorsum black, segments 3-7 with a basal yellow stripe, the rest with a yellow spot; wings hyaline, pterostigma pale fuscous. Length 50 millim.; alar expanse 64 millim.; pterostigma 3 millim.

Hab.: Hudson's Bay.

Subfam. AGRIONINA.

AGRION., *Fabricius*.A. VIOLACEUM, *Hagen*.

Violaceous: head with a transverse black stripe above, a large violaceous occipital spot on each side; posterior margin of the prothorax rounded, subexcised in the middle; dorsum of the thorax violet, with a narrow medial black stripe: sides pale violet, a bifid stripe above at the wings, and a line upon the middle black; feet pale, femora exteriorly, tibiae interiorly, and the whole of the tarsi black; abdomen violet, varied with black; abdomen of female yellowish-green, varied with black; wings hyaline, pterostigma rhomboidal fuscous. Length 33-36 millim.; alar expanse 40-44 millim.

Hab.: U. S. Mass. Connecticut, New York, Pennsylvania, Illinois.

A. SAVCIUM, *Burm.*

Red; head black above in the male, blackish fuscous in the female; posterior lobe of the prothorax short, the middle subdepressed; dorsum of the thorax black in the male, red in the female, sides yellowish-red; feet pale yellow; abdomen red, the seventh segment with the sides at the apex black, the remaining segments black: in the female the apex of the seventh segment has a point on each side; wings hyaline, pterostigma rhomboidal fuscous. Length 26-22 millim.; alar expanse 31-27 millim.

Hab.: U. S. Illinois, Pennsylvania, Maine, Mass. and Southward.

A. THASTATUM, *Say*.—A. ANOMALUM, *Rambur*.

Brassy-green, varied with orange and yellow; head brassy-green in front, with an orange occipital point at each side; prothorax with the posterior lobe somewhat pronounced in the middle; dorsum of the

thorax brassy-green, with a narrow yellow stripe on each side; sides yellow, brassy-green above, with a black stripe at the wings below; feet yellow, apex of the femora with an exterior black stripe; abdomen yellow, segments 1-2, having the dorsum brassy-green, the rest spotted with brassy-green, somewhat varied according to age; the tenth segment has a long process upon the middle, oblique, cylindrical, and bifid at the apex; wings hyaline, pterostigma of the posterior ones rhomboidal, black, of the anterior larger, rufous, surrounded with yellow, not attaining to the costal margin. The female differs in having more orange on the head, thorax, and abdomen, and the pterostigma of each of the wings regular yellowish. Length 23-27 millim.; alar expanse 23-30 millim.

Hab.: U. S. Indiana, Maine, Mass. and Southward.

A. IRENE, Hagen.

Bright brassy-green; head yellow in front; third article of the antennae annulated with pale colour; posterior margin of the prothorax broad triangular in the male, biemarginated in the female; dorsum of the thorax bright brassy-green, sides yellowish, brassy-green above; feet pale, exteriorly lined with black; abdomen slender, brassy-green; the sides and a basal lunule on segments 3-6 yellow; segment 8 with an apical spot, 9 with a triangular dorsal one, 10 almost altogether blue in the male, 9 blue at the sides, 10 at the apex in the female, margin of 10th segment excised dentated; wings hyaline, pterostigma short, rhomboidal, luteous. Length 25-28 millim.; alar expanse 28-30 millim.

Hab.: U. S. Chicago, Wisconsin, Illinois.

LESTES, Leach.

L. FORCIPATA, Rambur.

Brassy-green; mouth yellow; dorsum of the thorax brassy-green in the male, with a middle line and stripe on each side yellow in the female; sides yellow, with a superior green brassy stripe, dilated at the wings, or the male with an inferior black stripe; feet yellow, femora bilineated with black, interior of tibiae and tarsi black; abdomen brassy-green with yellow sides, pruinose at the base and apex in the male, a basal lunule upon the segments yellow; wings hyaline, pterostigma black, margined with yellow at the sides. Length 35 millim.; alar expanse 40 millim.; pterostigma $1\frac{1}{2}$ millim.

Hab.: U. S. Chicago, Wisconsin.

L. HAMATA, Hagen.

Brownish-brassy; mouth yellow; dorsum of the thorax brown-brassy, with a median line and a broad stripe on each side, narrowed at the wings, yellow; sides yellow, pruinose with a superior broad brown-brassy stripe and a black spot upon the pectus; beneath yellow; feet yellow, femora exteriorly, tibiae interiorly, and tarsi black; abdomen obscure green-brassy, with a basal yellow lunule to the segments; wings hyaline, pterostigma oblong, black, the sides margined with yellow. Length 42-38 millim.; alar expanse 45-43 millim.; pterostigma $1\frac{1}{2}$ millim.

Hab.: U. S. Chicago, Wisconsin; also Red River.

L. UNGUICULATA, Hagen.

Green-brassy; mouth yellow; dorsum of the thorax brassy-brown, a median line and narrow stripe on each side yellow; sides yellow pruinose, with a broad superior brassy-brown stripe, and a black broad vitta below; beneath yellow; feet yellow; femora bilineated with black, tibiae interiorly and tarsi black; dorsum of the abdomen green, the apex brown-brassy, a yellow lunule at the base of the segments, base and apex of the tergum pruinose, the sides yellow, venter black; wings hyaline, pterostigma oblong fuscous, the sides margined with yellow. The inferior fascia of the thorax wanting in the female. Length 40-30 millim.; alar expanse 43-37 millim.; pterostigma $1\frac{1}{2}$ millim.

Hab.: U. S. Chicago, Wisconsin, New York.

L. EURINA, Say.

Blue, varied with green and violet; mouth yellow; dorsum of the thorax with a yellow stripe on each side, which is cleft and dilated at the wings; sides yellow; abdomen blue, segments green at the apex; venter black; feet black, femora beneath and tibiae exteriorly pallid; wings hyaline, pterostigma black. Length 47 millim.

Hab.: U. S. Mass.

L. RECTANGULARIS, Say.

Brassy-fuscous; mouth yellow; dorsum of the thorax brassy-brown, with a median line and broad stripe at each side narrowed in front, yellow; sides pale yellow, with a brassy-brown stripe superiorly, and two linear black spots posteriorly; feet yellow, femora exteriorly, tibiae interiorly, and tarsi black; abdomen long, very slender, yellow,

the dorsum fuscous, apex of the segments black, with an interrupted yellow basal lunule; apical segments entirely blackish-fuscous; wings hyaline, the costa yellow, pterostigma short, the sides a little oblique, black. Length 53-41 millim.; alar expanse 49-41 millim.; pterostigma $1\frac{1}{2}$ millim.

Hab.: U. S. Chicago, Minnesota, Indiana, Pennsylvania, New York, Mass.

CALOPTERYX, Leach.

C. VIRGINICA, Drury ed. Westwood.—*C. DIMIDIATA, Rambur.*

Brassy-green, shining; labium, antennae, thoracic sutures, pectus, venter, and feet black; abdomen with the dorsal stripe, venter with segments 8-10 yellow; wings narrow, hyaline, the base somewhat flavescent, the apex blackish-fuscous; pterostigma in the female snow-white. Length 50-52 millim.; alar expanse 70-72 millim.; pterostigma 2 millim.

Hab.: Hudson's Bay, U. S. Mass. and Southward.

C. MACULATA, Beauv.—*C. HOLOSERICUS, Burm.*

C. PAPILIONACEA, Ramb.

Brassy-green or blue, shining; labium, antennae, thoracic sutures, pectus, venter, and feet black; abdomen with a dorsal yellow stripe, 8-10 segments in the female; wings very broad, densely reticulated, black, sometimes with hyaline spots in the male, or clouded with fuscous, and fuscous at the apex, the female with a snow-white pterostigma. Length 38-48 millim.; alar expanse 63-65 millim.; pterostigma $2-2\frac{1}{2}$ millim.

Hab.: U. S. Chicago, Mass. and Southward. A species common and widely diffused.

C. APICALIS, Burm.

Brassy-green, shining; labium, antennae, thoracic sutures, and pectus black, or in the female in part flavescent; feet long, black, with long cilia; wings narrow, hyaline, or with the apex narrowly fuscous, pterostigma absent. Length 42 millim.; alar expanse 62 millim.

Hab.: U. S. Pennsylvania, Mass.



