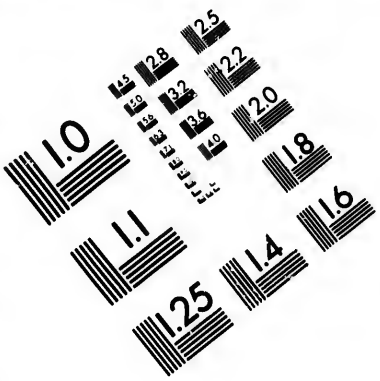


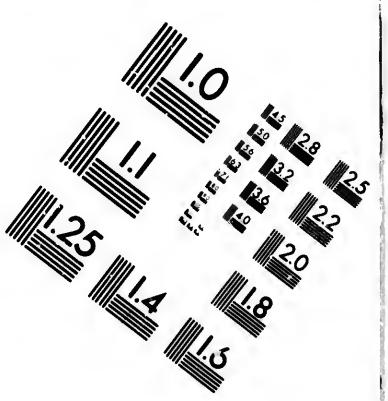


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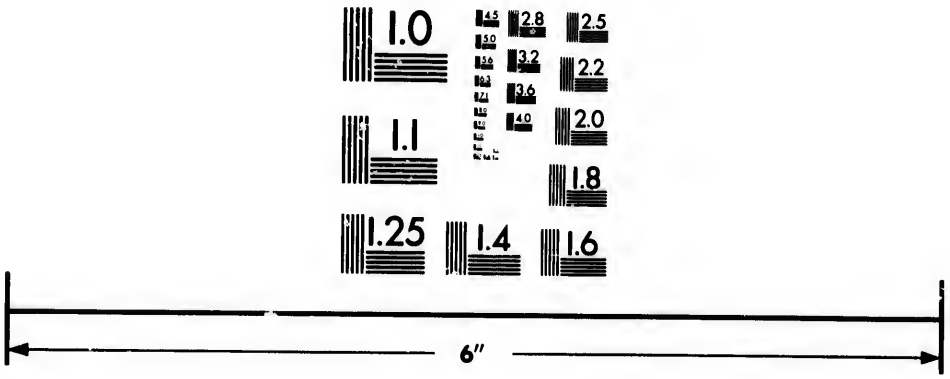


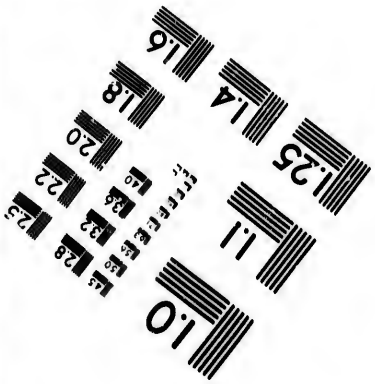


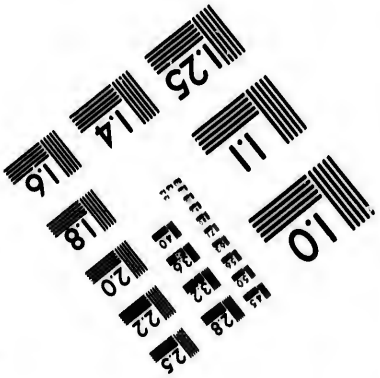


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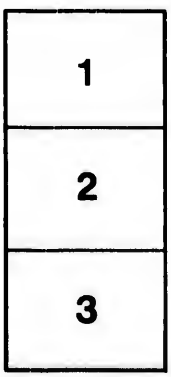


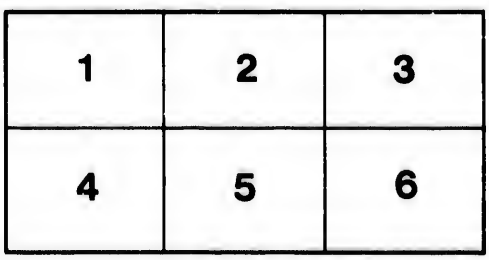

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# REVISION

OF THE

# NEMATINÆ OF NORTH AMERICA,

## A SUBFAMILY OF LEAF-FEEDING HYMENOPTERA OF THE FAMILY TENTHREDINIDÆ.

BY

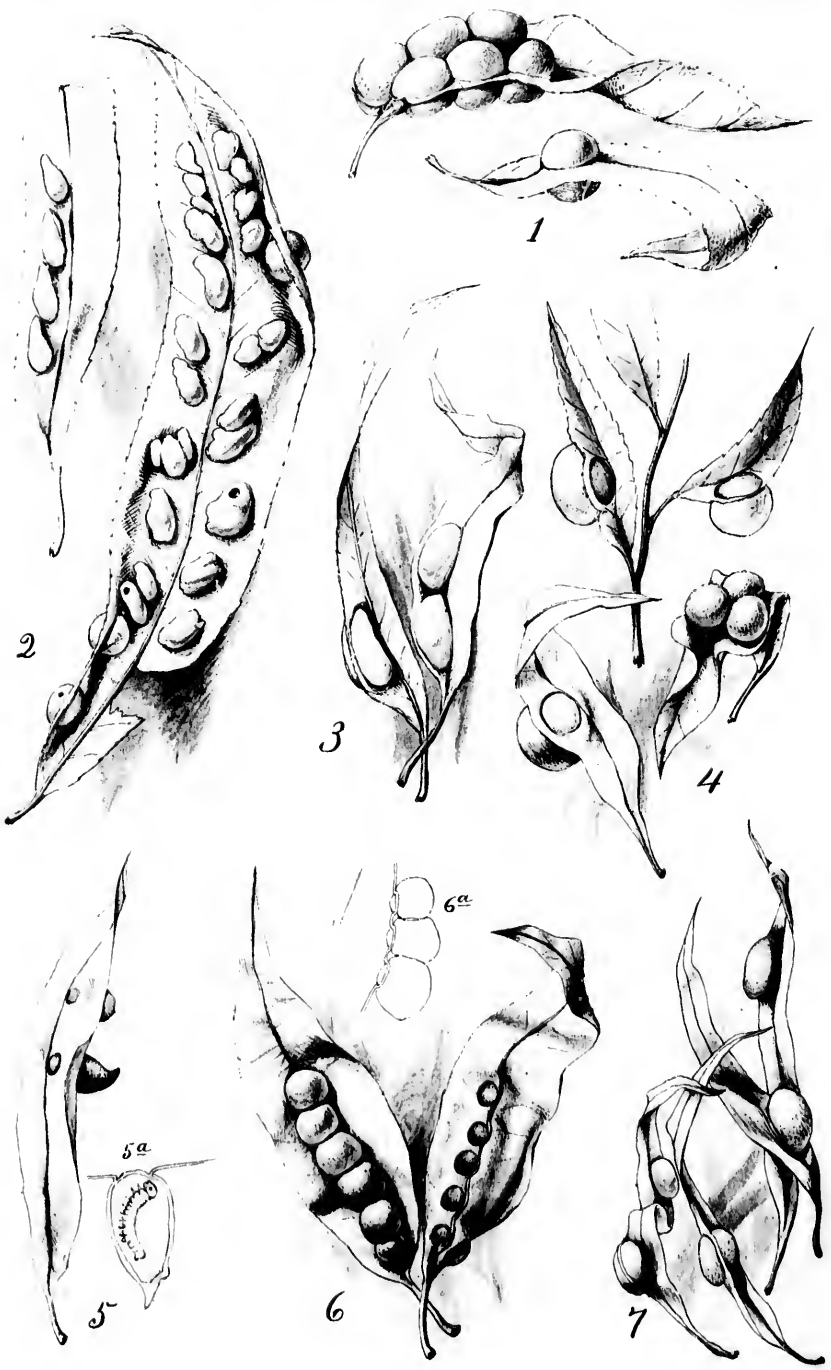
C. L. MARLATT,

FIRST ASSISTANT ENTOMOLOGIST.

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1896.




LEAF GALLS OF PONTANIA.

1. *Pontania resinicola* n. sp.
2. *P. hyalina* Norton.
3. *P. desmodioides* Walsh.
4. *P. pomum* Walsh.
5. *P. pyriformis* n. sp.
6. *P. monile* n. sp.
7. *P. brauweri* n. sp.

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# LETTER OF TRANSMITTAL.

UNITED STATES DEPARTMENT OF AGRICULTURE,
DIVISION OF ENTOMOLOGY,
*Washington, D. C., February 25, 1896.*

SIR: I have the honor to submit for publication the third number of the technical series of bulletins of this Division. It has been prepared by my first assistant, Mr. C. L. Marlatt, and consists of a monographic revision of the Nematinæ, an important subfamily of leaf-feeding hymenopterous insects of the family Tenthredinidæ. The larvæ of these insects are all plant-feeders and include among their number some very important enemies of cultivated plants. They represent, economically, the most important group of the family to which they belong.

Respectfully,

L. O. HOWARD,
*Entomologist.*

Hon. J. STERLING MORTON,
*Secretary of Agriculture.*

# CONTENTS.

# LIST OF ILLUSTRATIONS.

# THE NEMATINÆ OF NORTH AMERICA.

## INTRODUCTION.

The subfamily *Nematinæ* of Thompson or *Nematina* of Cameron (Konow's subtribe *Nematides*) comprises a very large group of closely allied species, distributed in the classification adopted by the author among nearly a score of genera. They range from very small insects to medium sized, but include no very large species, or in length from 2 to 12 mm. They are for the most part smooth, shining, and rather soft bodied, and are variously colored, but yet presenting frequently a confusing similarity in general form, and particularly in coloration, rendering their generic and specific references in some cases difficult. In point of number of species and abundance of individuals this subfamily far exceeds any other of the corresponding groups in the family Tenthredinidæ, and in variation and peculiarities in larval habits and in economic importance many of the species belonging to it have a very great interest.

*Geographical distribution.*—The Nematinæ are distinctly northern in their range, reaching their greatest development in abundance of species and specimens in the transition and boreal zones, and extend northward into circumpolar regions—species occurring abundantly in Greenland, Iceland, and Spitzbergen. Southward they become less and less numerous, and are practically wanting in tropical countries. This is illustrated very forcibly in Europe by the occurrence of over 70 species of the old genus *Nematus* in Scotland (Cameron) and 95 in Sweden (Thompson), as against 12 about Naples, Italy (Costa); and the same discrepancy exists between the temperate and subarctic region of America and the Southern States and Mexico.

*Food-plants*—Their food-plants cover a wide range, some species affecting grasses, one or two very destructive ones the grains, others various deciduous trees and shrubs, and still others conifers. The majority of the species occur, however, on plants of the families Salicaceæ, Betulaceæ, Rosaceæ, and Coniferæ, in the order given.

*Life history and habits.*—The Nematines are among the first sawflies to appear in spring, occurring abundantly on trees at the first appearance of the leaves. They do not often frequent flowers, except, at least, those of the plants upon which their larvæ feed. Many willow species, for example, occur abundantly on the earliest spring bloom of the willow.

In common with other sawflies, however, they rarely leave their larval food-plants, and to be collected successfully a knowledge of their habits in this respect is very desirable.

In number of broods great diversity is found, and the normal rule of most Tenthredinidæ, of a single yearly brood, is frequently deviated from. Some species are known to be limited in number of broods only by the length of the season, as, for example, *Pteronus ventralis* Say, the common willow species. Two annual generations are common, but many species are single brooded, the larvæ entering the soil or other material or remaining in their galls at the completion of growth and continuing in dormant condition until the following spring, when shortly before they emerge as perfect insects the change to the pupal condition takes place. The males normally appear a few days before the females, and the duration of the life of the adults of both sexes is short, not often exceeding a week or ten days. Of a large percentage of the species no males are known, and in the case of many species careful and repeated breeding records indicate that males are very rarely produced.

In some species parthenogenesis is complete; that is, the eggs from unimpregnated females produce other females. In other instances of parthenogenesis, however, either males only are developed from unfertilized ova or females very rarely.

The union of the sexes takes place very shortly after the appearance of the females and egg deposition closely follows. The eggs are inserted either singly or a number together in the young twigs, larger veins, petioles, in the surface parenchyma, or in the edges of the leaves, the single exception being the case of the gooseberry sawfly (*Pteronus ribesii*), which merely glues its eggs to the leaf without making any incision whatever.

Most of the species are external feeders on the foliage of plants, but the species of two genera, *Euura* and *Pontania*, so far as their habits have been studied, are gall makers, and pass their early life in the interior of the plants, either in the stems without causing abnormal growths or in the excrescences or galls on the stems and leaves. At least one American species develops in the rolled or folded edge of the leaf. The larvæ are 20-footed, some solitary, others gregarious—the latter usually more brightly colored and possessing means of protection in glands secreting a noxious fluid. Most of the solitary ones are green and not readily observed. They usually feed from the underside of the leaves, eating from the edge or cutting circular holes in the general surface, and in some cases taking everything but the stronger veins. Many species rest quietly during the day, feeding only at night. Some have the habit of throwing the posterior segments violently upward to frighten away parasites or enemies; others adhere to the leaves or twigs by the thoracic feet only, coiling the posterior segments under the middle ones.

The nematine larva, after its final molt,[1] generally enters the ground to pupate, spinning a double or single silken cocoon more or less incorporated with particles of earth exteriorly. In the case of the species having several broods annually, the cocoons, at least of the summer generation, are frequently constructed above ground, either among the dry leaves and rubbish at the base of the host plant, or on the twigs, or in crevices of the bark of the latter. Some of the gall species pupate in their galls, but many of them abandon their galls to undergo their transformations in rotten wood, in the pith of plants, in deserted galls, or in the earth.

Species living exposed on the leaves will also sometimes enter deserted galls, either to transform or to hibernate.[2]

*Range of species and economic importance.*—Some few species are known to be widely distributed, and this is particularly true of the larch sawfly, which occurs throughout Canada and the Northern States, and also in Europe. Whether this species (*Lygæonematus erichsonii* Hartig) can be called an introduced species or not is a question. Its wide distribution throughout the Northern States would seem to indicate that it has, perhaps for many centuries, occurred on both continents. The gooseberry and currant sawflies, however (*Pteronus ribesii* Scop. and *Pristiphora appendiculata* Hartig), are undoubted cases of importation. The economic importance of the group is well illustrated by the species just mentioned, the last two being among the most serious enemies of several small fruits, and the first threatening the almost total destruction of the larch forests in many districts. Other examples of very destructive species are the willow sawfly (*Pteronus ventralis* Say), the wheat sawfly (*Pachynematus extensicornis* Nort.), the Western pear sawfly (*Gymnonychus californicus* n. sp.), and the cranberry sawfly (*Pristiphora idiota* Nort.).

*Difficulties arising from confusion of species and loss of types.*—The classification of this natural and distinctly differentiated subfamily has been, until quite recently, in a very experimental and unsatisfactory condition, and this is particularly the case with the genus *Nematus*, which, cumbersome from the number of species referred to it, has been invariably a stumbling block to every student of the Tenthredinidæ. Following the lead of the earlier European writers on the group, American describers of species in the old genus *Nematus* have based their characterizations almost solely on mere differences in coloration, with such references to structural features as are of little value or of generic rather than specific importance. The failure to note the variations in the structure of different parts of the insect has led to the most

[1] See "The Final Molting of Tenthredinid Larvæ," Proc. Ent. Soc. Wash., vol. II, p. 115.

[2] See "Hibernation of Nematids and its bearing on Inquilinous Species," Proc. Ent. Soc. Wash., vol. III, p. 263.

confusing assemblage of different species under the same name, and, worse than this, the bringing together of representatives of different genera under a single species. This is well illustrated in the species *corniger* and *subalbatus*, under which names specimens were found grouped in the collections of the American Entomological Society which belong to at least four distinct genera. In cases like this it is sometimes difficult, particularly where the type specimens are lost, to decide to which genus the species bearing the original name should be assigned. The difficulties of the case have been greatly enhanced by the fact that Norton, who has described most of our species, allowed many of his types to be destroyed through his indifference in later life, after he had ceased studying the group, thus vitiating much of the excellent work of his earlier years. A box of his type specimens examined by me, which had recently been returned to the Entomological Society of Philadelphia, was so thoroughly disintegrated by vermin that scarcely a recognizable fragment remained.

The very careful work done in the last few years by Fr. W. Konow, of Fuerstenberg, Germany, particularly in separating the old bulky genus *Nematus* into some nine genera, has made it possible to take up this group much more satisfactorily than heretofore, and in the preparation of this paper Konow's system has been the basis of the classification adopted.

*Sources of material.*—The proper placing in the new genera of the species formerly included in *Nematus*, which in scarcely an instance can be gathered from the original descriptions, has necessitated the examination of all the old types of Norton, Cresson, and others, and these have been redescribed, whenever obtainable. The material in the genus *Nematus* in the collection of the American Entomological Society, which includes all of Cresson's and Norton's types, so far as they have been preserved, has been very kindly placed at my disposal. I have also had the National collection at hand, and material from a number of private collections, the most important of which are the Nematines from Cornell University, kindly loaned by Professor Comstock, and the types of Messrs. Harrington, Dyar, Forbes, Ashmead, and McGillivray. The types of Provancher's two species were also very kindly obtained for me by Abbé Huard. The types of Kirby's species and of a few others described abroad I have been unable to examine and refer generically, and the original descriptions of these, together with the descriptions of the lost types of Norton, are included in an appendix.

*Structure and terminology.*—In recharacterizing the old species and working up the large amount of new material which has accumulated, parts hitherto rarely used have been referred to and terms repeatedly employed throughout the descriptions which would be unfamiliar to most students. The following description of the salient characters used in the descriptions and the terminology will therefore be valuable.

The head is convex in front and more or less concave posteriorly. It presents in the characters of the clypeus and of the occipital and frontal ridges, together with the antennæ, very valuable characters for the separation of genera and species. The difficulty of examining the mandibles in dried specimens renders the use of these parts in descriptions inadvisable, and this holds true also of the maxillæ and labium. There is also usually a notable variation in structure between the right and left mandible. (See fig. 2.) The palpi of the maxillæ and labium, the former 6-jointed and the latter 4-jointed, are usually soft and lose shape more or less in drying, and are difficult to make out without softening and dissection. The clypeus, if emarginate at the apex, will present good differences in the nature of the emargination, whether

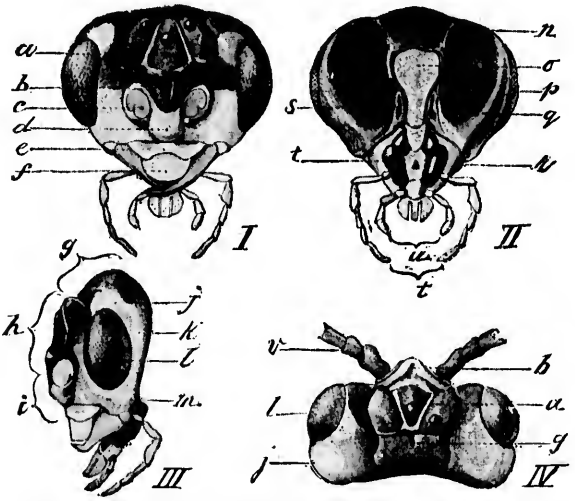


FIG. 1.—Head of *Pteronus*: I, front; II, rear; III, lateral; and IV, dorsal view: *a*, ocellar basin; *b*, antennal fovea; *c*, socket of antenna; *d*, hypoclypeal plate; *e*, clypeus; *f*, labrum; *g*, vertex; *h*, front; *i*, face; *j*, upper orbit or temple; *k*, posterior orbit; *l*, eye; *m*, lower orbit or cheek; *n*, occiput; *o*, occipital foramen; *p*, eye; *q*, cheek; *r*, mandible; *s*, occipital fossa; *t*, maxilla; *u*, labium; *v*, antenna (original).

broadly or narrowly, deeply or shallowly, and also in the character of the lobes produced by this emargination, whether they are rounded or triangular, and their width relative to the width of the clypeus. The vertex frequently presents very prominent grooves and ridges, and these, particularly the ridges surrounding the anterior ocellus and inclosing quite a large basin in front of it, are very important. The sides of this basin are either strongly and sharply or broadly and roundly elevated, or in some genera they are subobsolete or wanting, as in *Pristiphora*. The anterior wall of this basin is usually much more strongly raised and wider than the lateral walls, and frequently extends beyond the basin nearly to the compound eyes on either side. This I have termed in the descriptions the frontal crest. Between the bases

of the antennæ and immediately in front of this crest is a distinct depression or fovea—the antennal fovea—which varies remarkably in different species, but is quite uniform within species limits. In some cases this fovea breaks through the frontal crest, uniting more or less completely with the ocellar basin, in which case the crest is said to be broken. The apex of the more or less prominent ridge between the bases of the antennæ, in which this fovea is situated, is known as the antennal tubercle.

The antennæ are always 9-jointed, the two short basal joints constituting the scape and the others the flagellum. The antennæ are of great value in generic and specific characterizations, both in the matter of length relative to the body and in general shape and length of joints. They are usually simple and tapering, in some genera filiform, longer in the male than in the female, and frequently in the males with the basal joints of the flagellum more or less flattened or compressed. In some instances the basal joints, particularly in the males, are toothed or branched.

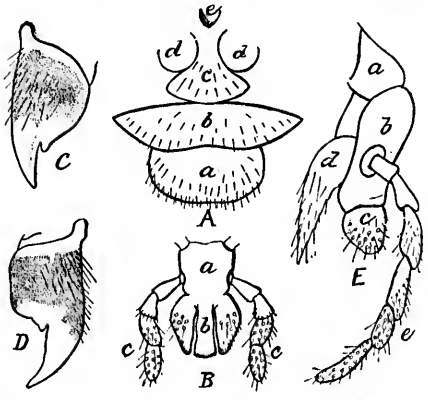


FIG. 2.—Mouth-parts of *Pachynematus erichsonii*: (A) *a*, labrum; *b*, clypeus; *c*, hypoclypeal plate; *d*, *d*, antennal sockets; *e*, antennal fovea. (B) Labium: *a*, mentum; *b*, ligula; *c*, *c*, palpi. (C) Right mandible. (D) Left mandible. (E) Maxilla: *a*, cardo; *b*, stipes; *c*, galea; *d*, lacinia; *e*, palpus (original).

The thorax, except in punctuation and hairy vestiture, presents few structural characters of value in specific description. It is important, however, to understand the terminology of the parts to properly appreciate the color descriptions. It presents a large number of sclerites—often small and somewhat obscure—which seem never to have been very carefully described, and some of the more important divisions have been very commonly misapprehended. The accompanying illustration (fig. 3) shows more fully than will be undertaken in the text the superficial anatomical structure of this division of the body. When softened and subjected to dissection, the thorax readily separates into three parts—not, however, on the lines commonly supposed to represent the divisions between pro-, meso- and metathorax. The pronotum attaches to the mesothorax and the so-called episternum of the metathorax is seen to be mesothoracic.

To the dorsal region of the prothorax the pronotum, or first division of the thorax, is generally assigned. This sclerite, as just indicated, is most intimately and inseparably fused with the mesothorax and is scarcely at all attached to the lateral and ventral sclerites of the prothorax, which support the head and to which the anterior legs are joined. On this ground, Kirby refused to consider this sclerite protho-

racic, but Burmeister and later authors have given good reasons for considering it to represent the dorsal arc of the prothorax or the pronotum, and it is so designated in this paper.

Belonging to the mesothorax are the tegulæ, anterior and lateral lobes of the mesoscutum, mesoscutellum, and mesopostscutellum (for brevity the second and third divisions are referred to as the anterior and lateral lobes and the scutellum). The mesopostscutellum is found to enter very deeply into the interior of the thorax, doubtless to furnish attachments for the powerful wing muscles (fig. 3, *i*), and forms an invagination which nearly cuts the body in half at this point. The division of the body at this point is analogous to the separation in

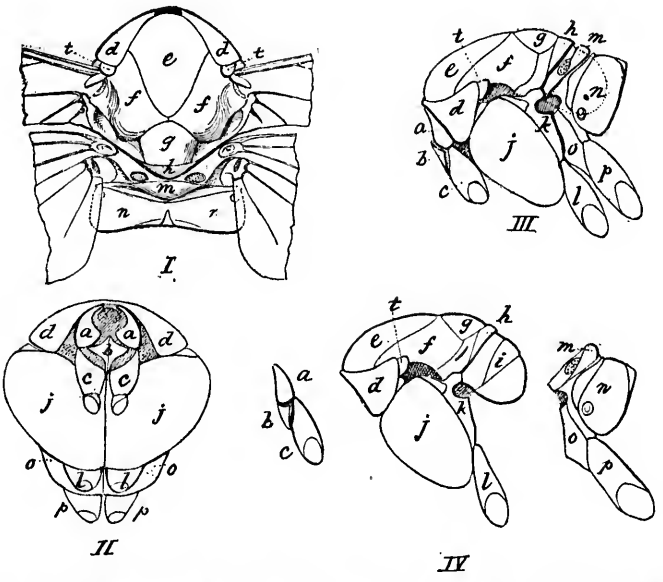

FIG. 3.—Thorax of *Pachynematus erichsonii:* I, dorsal view; II, ventral; III, lateral; and IV, lateral with segments separated. *Prothorax: a*, episternum; *b*, sternum; *c*, coxa; *d*, pronotum. *Mesothorax: e*, anterior, and *f*, lateral lobes of scutum; *g*, scutellum; *h*, postscutellum; *i*, mesophragma; *j*, epimeron; *k*, posterior plate of epimeron (?); *l*, coxa. *Metathorax: m*, scutum; *n*, scutellum; *o*, epimeron; *p*, coxa; *t*, tegula (original).

Coleoptera between the prothorax and mesothorax, the last thoracic division in sawflies being intimately joined with the abdomen, as are the last two divisions in beetles. Belonging to the metathorax are the metascutum and metascutellum.

This last sclerite—the metascutellum—is commonly designated in descriptions as the "basal plates," and these have always been matters for dispute among entomologists. Of the European writers, André, following Latreille and Audouin, considers them as constituting the dorsal arc of the first abdominal segment; Cameron, as representing a fourth thoracic segment (an impossibility from our accepted standard of the structure of insects), and Westwood, on grounds which seem

entirely valid, shows that they really represent the terminal sclerite of the metathorax, namely, the metascutellum. This is plainly apparent from an examination of the genus *Cephus*, where the parts are very plainly differentiated and their relationship easily deciphered. There is a suture or fold separating the narrow anterior margin of this sclerite, but the portion so separated is intimately joined to the posterior portion and need not be separately designated. This sclerite is strongly incised at the apex centrally and this incision is covered with a white membrane, which, in descriptions, is commonly referred to as the white blotch of the so-called basal abdominal segment. The universal occurrence of this white blotch and its slight variation, except in the case of the larger groups of genera, make it ordinarily of little value in descriptions of species. In the comparisons of older descriptions the white spot on the basal segment will be understood to mean this blotch, and in harmonizing these with the characterizations of species in the following pages it must also be remembered, in referring by number to the segments of the abdomen, that the so-called first segment belongs to the thorax.

The pair of white spots occurring on the upper edge of the metascutum, termed *cenchri*, also occur uniformly in all Tenthredinidæ and present no important variation in genera, and although they have been referred to in most of the older descriptions, it has not been deemed necessary to mention them in the characterizations of the following pages. These spots, uniformly oval and whitish in color and bearing a hexagonal surface sculpturing, have not been understood so far as their function is concerned. I am inclined to believe them to be sound organs, and that by the rubbing of the base of the subcostal veins of the hind wings over them a vibration of the cenchral plate or of the plate and vein results, which produces sounds audible to the insect ear. The structure of the cenchri has been hitherto erroneously given; they consist uniformly of projecting plates attached basally, which protect or cover openings into the thorax. In the case of the Lydinæ, the plate projects or is distinctly raised above the general surface, so that the free edge is plainly noticeable. The idea has therefore been that in the Lydinæ the true cenchri are covered by an overhanging plate. In this subfamily, however, these plates are the cenchri, there being no membrane or structure beneath them; and in other subfamilies the posterior free edge fits down more closely into the opening of the cavity, so that the fact that it has a free posterior and lateral margin may only be discovered by dissection.

The lateral and ventral aspect of the thorax includes, for the prothorax, an episternum and a central sternal plate; for the mesothorax, an epimeron and an episternum, and other sclerites which are rudimentary or unimportant. The meso-epimeron is very large and represents the bulk of the side and venter of the thorax. The divided sclerite immediately back of it, which supports on its upper extremity

the anterior wings, has by some authors been considered to represent the episternum of the metathorax. As already indicated, it is intimately fused with the mesothorax, and its place here is still further shown by its relation to the anterior wings. The epimeron of the metathorax is comparatively small, and the episternum is apparently wanting, unless the sclerite just above the metepimeron may be so considered.

The leg includes a large coxal joint, 2-jointed trochanter, and the femur, tibia, and tarsus occurring in the order named. In two genera the legs are characteristically shaped—*Crœsus* having the apex of the hind tibiæ and the metatarsus broad and flattened, resembling the condition obtaining in social bees, and *Holcocneme* having these parts somewhat enlarged and the posterior tibiæ distinctly grooved exteriorly. This last character is, however, present in other genera, though less distinctly. The tibial spurs, of which there are two at the apex of each tibia, do not vary sufficiently to be of much value in generic or specific descriptions. The forward one of the anterior pair of legs is much stronger than the others, and doubtless serves the rôle of an antennal scraper, as does the corresponding spur in other Hymenoptera.

The claws, while affording primarily generic characters, are of some value in the characterization of species. Three distinct types of claws are noted, viz, the first, in which the claw is more distinctly cleft, the two teeth, which have been termed rays throughout the descriptions, extending in a direction nearly parallel, the inner ray being commonly not much shorter than the outer (fig. 4, *d*, *e*, *f*); the second form of claw consists in the projection of a minute tooth well within the apex of the claw and extending nearly at right angles to the claw (fig. 4, *b*, *c*); and the third, a simple claw, without branch or tooth (fig. 4, *a*).

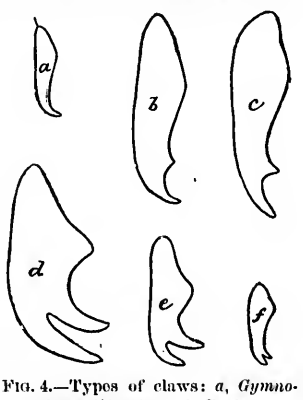


FIG. 4.—Types of claws: *a*, *Gymnonychus californicus*; *b*, *Pachynematus extensicornis*; *c*, *Lygœonematus erichsonii*; *d*, *Amauronematus luteotergum*; *e*, *Pteronus cornelli*; *f*, *Pontania agilis* (original).

The abdomen is ovate or elliptical, less commonly elongate, as in *Euura*, and usually more or less depressed. It presents in the female nine dorsal arcs, if the small terminal sclerite attached to the large overlapping eighth arc is considered to be distinct. This last sclerite, the ninth, bears laterally within the margin at its base the two unjointed appendages known as cerci. The female has but six ventral arcs, the terminal ones being metamorphosed into the ovipositor and its basal supports.[1] The male abdomen has seven prominent dorsal arcs, with a thin and frequently concealed terminal arc, and seven ventral arcs, the last (hypopygium) being very long, more or less curved upward at the tip,

[1] For structure of this organ in Hymenoptera, see Proc. Ent. Soc. Wash., vol. II, p. 201.

and incloses, with the terminal dorsal arc (pygidium), the claspers and sexual organs. To use these latter in description requires dissection, and they have not, therefore, been referred to.

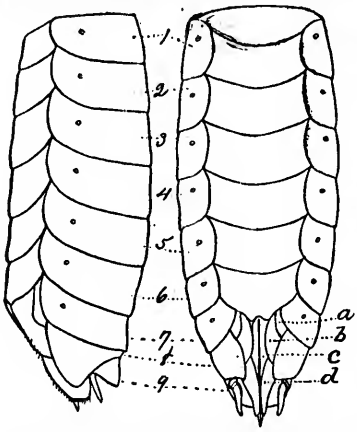


FIG. 5.—Abdomen of *Pachynematus erichsonii*, lateral and ventral views: Segments numbered 1 to 9; *a*, spicule plate; *b*, basal portion, or support of sheath; *c*, ovipositor; *d*, apical portion of sheath, or sheath proper—enlarged (original).

In the female the sheath of the ovipositor has been referred to throughout the descriptions, and the more prominent variations consist in its width and in the character of the upper and lower margin and of the apex. The hairy vestiture, particularly that of the extreme apex and the lower margin, also presents good specific characters. The cerci are either very short, robust, or spindle-shaped, or are very elongate and slender.

In the males the apex of the seventh dorsal segment and the terminal ventral segment are useful, particularly in generic separation, and also present specific features, particularly in the terminal prolongation from the center of the seventh dorsal segment, which projection, following Konow, is referred to in the descriptions as the procidentia. The narrow projecting tip of this segment is usually thickened and prominent, and varies in its width relative to its length and in the character of the constriction, or otherwise, of its base.

The subject of the venation of Tenthredinidæ has been fully discussed elsewhere and need not be referred to at length here.[1] The normal venation of the Nematines is indicated in the accompanying figure (fig. 6). Of importance in specific characterization are the intercostal cross vein in its relation to the basal vein, and its angle with the costa; the second recurrent vein, as to whether interstitial with the second transverse cubital or received beyond or within the latter; and in the posterior wings, the relation of the outer veins of the discal cells. The shape of the cells of the anterior wings is of comparatively little importance, with the exception of the third cubital, which

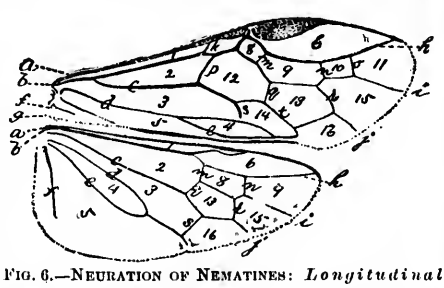

FIG. 6.—NEURATION OF NEMATINES: *Longitudinal veins.*—*a*, costal; *b*, subcostal; *c*, median; *d*, anal; *e*, accessory; *f*, axillary; *g*, inferior; *h*, radial; *i*, cubital; *j*, subdiscal. *Cross veins.*—*k*, transverse costal; *m*, *n*, *o*, first to third transverse cubitals; *p*, basal; *q* and *r*, first and second recurrents; *s* and *t*, first and second transverse medians. *Cells.*—1, costal; 2, subcostal; 3, median; 4, lanceolate; 5, anal; 6, radial; 8–11, first to fourth cubitals; 12–14, first to third discals; 15, 16, first and second posteriors. (In the hind wing cells 8 and 13 are usually termed the discal cells). (Original.)

[1] Proc. Ent. Soc. Wash., III, pp. 78–82.

sometimes presents good specific characters in the matter of its length compared with its width, and of the length, respectively, of its basal and apical cross veins. In a few species the relative length of the discal cells of the hind wings is of importance. In general, however, the neuration of the wings of the Nematines (I refer here more particularly to the genera developed from the old genus *Nematus*) is strikingly uniform—so much so that repeatedly in the descriptions reference is made to what is termed normal venation. This venation will be understood by a reference to the figure which is drawn to represent such venation, and, briefly, consists in the intercostal cross nerve being inclined and about its own length anterior to the basal nerve; the second recurrent being received well within the second cubital cell; the third cubital more than half as wide at base as at apex and about twice as long as wide at base; the upper discoidal cell of the hind wings exceeding the lower and about twice as long as wide. The stigma varies considerably in different genera, and also within the limits of species. This variation relates to its width compared to its length and the character of its apex, whether suddenly or rather obtusely pointed, or distinctly acuminate, and also in the character of its lower border, whether regularly circularly rounded or nearly straight or more or less angulated.

The features of coloration, which have hitherto been used almost exclusively in the differentiation of species, are often constant and furnish reliable characters, but can not be implicitly relied upon. For the ready separation of species and for use in synoptic tables, color will always be more valuable than structural characters, especially to the beginner (see p. 23). The surface characters of the species, such as punctuation and hairy vestiture, are of both specific and generic value, but are less striking and significant in this subfamily than in most of the other divisions or in other families of Hymenoptera.

*Secondary sexual characters.*—The correct association of the males and females, in the absence of breeding records, is a difficult matter, on account of the striking variation in the sexes in shape, structure of certain parts, and particularly in coloration. The most important secondary sexual characters are: Color, the male being usually much darker than the other sex; form, the male in general being much more elongate; and shape of antennæ, which in the male are commonly very much longer than in the female and frequently compressed basally.

## CLASSIFICATION.

The following characteristics distinguish the Nematinæ from allied groups: Antennæ 9-jointed, usually elongate, slender, tapering, rarely with processes on basal joints, frequently more elongate in the males than in the females, and somewhat compressed; anterior wings with simple, seldom-divided radial cell, in which latter case the second cubital receives both recurrent veins; basal nervure converging with

the first recurrent nervure; hind wings always with two discal cells and with complete lanceolate cell.

The following table of genera is based in part on the classification given by F. W. Konow,[1] and it is hoped that it will facilitate the recognition of the new genera, most of which are represented among our North American species.

The revision of genera with redescriptions of old species is limited to the genera formerly included in the genus *Nematus*.

Of the other genera a list of the American species only is given, together with a few notes on synonymy.

TABLE OF GENERA.

Anterior wings with simple radial cell.
  Lanceolate cell widely contracted in the middle.
    Second and third cubital cells each receiving a recurrent vein.
      Third to fifth, sometimes sixth and seventh, antennal joints of the male with a more or less prominent branch at the tip; antennæ of the female somewhat compressed and with sharp projection at tip of basal joints..... p. 19..... I. *Cladius* Illig.
      Joints of antennæ without projections at tip; third antennal joint curved at the base, in the male with a short, blunt fork beneath, and in the female with a sharp projection.... p. 29.. II. *Trichiocampus* Htg.
      Antennæ without peculiarities..... p. 29.... III. *Priophorus* Latr.
    Second cubital cell receiving both recurrent veins.
      Claws bifid..... p. 30. IV. *Camponiscus* Newm.
      Claws simple..... p. 39. V. *Anoplonyx* gen. nov.[2]
  Lanceolate cell petiolate.
    Third transverse cubital wanting..... p. 39.. VI. *Euura* Newm.
    Third transverse cubital present.
      Claws bifid, clypeus usually emarginate.
        Tip of the eighth dorsal segment of the male with a small, blunt, more or less awl-shaped, projection; antennæ of female filiform, small species, 2 to 5 mm. long, stigma often having clear base, sheath often pointed at tip, gall inhabiters p. 50 VII. *Pontania* Cost.
        Eighth dorsal segment of male broader, obtusely pointed, or not at all produced at tip; antennæ distinctly tapering toward tip; stigma not lighter at base; sheath not pointed at tip; body more robust.
          Last ventral segment of male obtusely triangularly produced at tip; sheath of female of the usual form; posterior tibiæ simple.
            Mesonotum and pleuræ shining; antennæ long and slender, usually lighter colored beneath; head, viewed from the front, almost round; labium but slightly projecting; sheaths usually narrow and delicate.. VIII. *Pteronus* Jur.
p. 44

[1] Deutsche entomologische Zeitschrift for 1890, pp. 225–255.

[2] *Anoplonyx* gen. nov. (ἀν, without; ὅπλον, weapon; ὄνυξ, claw) is separated from *Camponiscus* Newm. (of which *Leptopus* Hartig is a synonym) by the very important character of a simple claw without branch or inner tooth. The type of both Newman's and Hartig's genus is *Camponiscus luridiventris* Fall., in which the claws are deeply notched, the rays being subequal. *Anoplonyx* will include *Camponiscus pectoralis* Lep., *C. bicolor* Lep., and *C. ovatus* Zadd. The other two species of this genus, *C. aurita* Z. & B., and *C. carinthiacus* Z. & B., I have not had an opportunity to examine; they may belong with *C. luridiventris* or possibly come in the new genus.

Mesonotum and pleuræ opaque, with very dense and fine punctures; antennæ short, tapering decidedly toward tip; head more or less triangular and with long, projecting labium; stigma narrow, tapering posteriorly, lengthened; sheath rather thick and stout. IX. *Amauronematus* Knw. p. 75

Last ventral segment of male excavated at tip, not obtusely triangularly produced; sheath of female very broad or the posterior tibiæ and tarsi thickened.

Posterior tibiæ and tarsi very broad and flattened.

X. *Crœsus* Leach. p. 86

Posterior tibiæ and tarsi not flattened.

Posterior tibiæ and tarsi thickened, tibiæ externally with longitudinal furrow ..... XI. *Holcocneme* Knw. p. 87

Posterior tibiæ and tarsi simple; sheath very thick and stout..... XII. *Nematus* Jur. p. 87

Claws with short tooth within tip, tooth projecting nearly at right angle.

Clypeus emarginate.

Vertex with distinct pentagonal area.

XIII. *Pachynematus* Knw. p. 91

Vertex without pentagonal area. XIV. *Micronematus* Knw. p. 110

Clypeus truncate.

Pentagonal area more or less distinct; eighth dorsal segment carinated, subproduced; sheath simple; elongate species.

XV. *Lygæonematus* Knw. p. 111

Pentagonal area wanting; sheath with distinct scopa; first transverse cubital frequently wanting; short, ovate species ..... XVI. *Pristiphora* Latr. p. 113

Claws simple, without branch or tooth.

XVII. *Gymnonychus* gen. nov.[1] p. 122

Anterior wings with divided radial cell.

Lanceolate cell petiolate..... XVIII. *Dineura* Dahl. p. 125

Lanceolate cell contracted..... XIX. *Hemichroa* Steph. p. 125

## I. Genus CLADIUS Illiger.

*Cladius* Ill. Fauna Etrusca, 2d ed., p. 27, 1807.

*Cladius pectinicornis* Fourcroy. Entom. Paris., II, p. 374, 1785.
*Cladius isomera* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 223, 1861.

The only representative of this genus in this country is the well-known enemy of the cultivated rose, described as new by Norton under the name *C. isomera*. An examination some years since of Norton's species in comparison with the European *C. pectinicornis* indicated at once the identity of the two. The common European enemy of the rose had evidently been early imported with rose plants into New England, and the attention of Harris and Norton was drawn to it at a time when comparisons were out of the question, and it was very naturally described as a new species. For a full account of its habits, with figures, see Insect Life, vol. V, p. 6.

[1] From γυμνός, naked, and ὄνυξ, claw.

## II. Genus TRICHIOCAMPUS Hartig.

*Trichiocampus* Htg., Fam. Blattw. u. Holzw., p. 176, 1837.

SPECIES.

*gregarius* Dyar. Can. Ent., XXVII, p. 191, ♂, 1895.
*viminalis* Fallen. Svensk. Vet.-Akad. Handl., XXIX, p. 117, 1808.
*Aulacomerus lutescens* Lintner. 4th Rept. N. Y. State Entom., pp. 94–96, 1888.

## III. Genus PRIOPHORUS Dahlbom.

*Priophorus* Dahl. Conspect. Tenth. Scand., p. 4, 1835.

SPECIES.

*aequalis* Norton. Trans. Am. Ent. Soc., III, p. 78, ♂, 1872.
*simplicicornis* Cresson. Trans. Am. Ent. Soc., II, p. 367, ♂, 1869.
*solitaris* Dyar. Can. Ent., XXVII, p. 192, ♀, 1895.

## IV. Genus CAMPONISCUS Newman.

*Camponiscus* Newm. Entomologist, IV, p. 215, 1869.

No American species.

## V. Genus ANOPLONYX Gen. Nov.

No American species.

## VI. Genus EUURA Newman.[1]

*Euura* Newm. Entom. Mag., IV, p. 259, 1837.

SPECIES.

*albiricta* Cresson. Trans. Am. Ent. Soc., VIII, p. 4, ♀, 1880.
*mexicana* Cameron. Trans. Ent. Soc. Lond., 1884, p. 482, ♀.
*nigra* Provancher. Addit. Faun. Can. Hymen., p. 346, ♀, 1888.
*orbitalis* Norton. Proc. Ent. Soc. Phil., I, p. 144, ♀, ♂, 1862.
*salicicola* Smith. N. A. Entom., I, p. 41, 1879.
*salicis-nodus* Walsh. Proc. Ent. Soc. Phil., VI, p. 253, ♂, 1866.
*salicis-ovum* Walsh. Proc. Ent. Soc. Phil., VI, p. 252, ♀, ♂, 1866.
*perturbans* Walsh. Proc. Ent. Soc. Phil., VI, p. 254, ♀, ♂, 1866.

## VII. Genus PONTANIA Costa.

*Pontania* Costa. Fauna Napoli, Tenthred., 1859, p. 20.

Body small, smooth, clypeus, emarginate at tip, tarsal claw bifid, stigma usually lighter at base, eighth dorsal segment of male with procidentia produced, narrow, obtusely pointed, more or less awl shaped, black. Female antennæ subfiliform, sheath often pointed. Gall inhabiters. Species three to five millimeters long.

[1] I have a considerable amount of material in this genus and hope soon to give it a thorough revising. Until this is done, unbred material can not often be satisfactorily placed.

This genus, as characterized above by Konow,[1] includes a group of small Nematines which, so far as their habits have been discovered, breed in galls on the leaves of various species of willow. So far as I am aware, all willow-leaf galls are caused by these insects. The Euuras, which come closest to them in habit, always produce galls in twigs or buds or inhabit twigs without resulting gall formations, and never attack the leaf proper.

The European species, now known as *Pontania gallicola* Steph., is the type of the genus, and was described by Linnæus in 1761 as *Cynips caprew*, evidently from the gall alone, and was referred to *Cynips* until 1835, when the name *Nematus gallicola* was given it by Stephens, using Westwood's manuscript. The adult insect seems now for the first time to have been characterized. It was subsequently described by Hartig as *Nematus vallisneria* (1837), and in 1859 the genus *Pontania* was erected for Hartig's species by Costa. This genus was not very generally adopted until revived by Konow.

The habits of a number of our species have been detailed, notably by Mr. Walsh,[2] and particularly the latter's species—*pomum*,[3] *pisum*, and *desmodioides*. A quantity of material in various species has also been bred at the Department of Agriculture, and the habits of the genus based on these records may be briefly summarized, as follows:

The galls, induced by the egg punctures of the females in young, tender leaves, begin to develop in early summer and are usually globular and fleshy and greenish in color, but later in the season frequently become rosy tinted or brownish. The larva reaches full growth early in the fall (September), and by this time has completely eaten out the interior of the gall, leaving it a mere shell filled with frass. The gall is almost invariably abandoned at this time by the larva, and the species studied at the Department seem to prefer to enter soft or rotting wood or the pith of plants to construct their hibernating cocoons. In the absence of such material they will form cocoons in the earth, and if supplied with neither earth nor wood they will sometimes hibernate within their own galls or enter others of their own species or of other insects. Pupation and transformation to the adult take place in the early part of March and during April, extending into May. Indoors, in breeding cages, where they are subject to unnatural conditions, they may issue as early as February, but this is exceptional.

Mr. F. H. Chittenden, who has reared a number of these insects from cocoons in dead wood of maple, says of the adults (males of *Pontania pisum*) that they are extremely active and pugnacious. "Confined in a small vial, they began to fight at once, and when separated but a single specimen issued from the nuclée in perfect condition, the remainder being minus antennæ and legs."

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[1] Deutsche Entom. Zeitschrift, 1890, p. 237.

[2] See Proc. Ent. Soc. Phila., VI, pp. 248-264; Am. Entom., vol. II, pp. 45-50.

[3] The cumbersome and unnecessary term *salicis* has been omitted in the case of this and the other species to which it has hitherto been prefixed.

The larvæ are rather slender, ranging from 6 to 10 mm. in length, few, however, exceeding 7 or 8 mm. They have apparently 18 feet—6 thoracic and 12 abdominal—the anal pair of abdominal feet being rudimentary. Up to maturity, the body is yellowish white, the head resinous or brownish, tips of mandibles darker, and the eyes, with narrow border, dark brown, almost black. The last joint of the thoracic legs and the claws are resinous. Just before abandoning their galls the larvæ undergo the final molt,[1] assuming a body tint of a dull grayish purple, the head becoming by contrast and in fact of a lighter brown. This obscure coloring is unquestionably a most valuable safeguard against discovery by predaceous insects or birds during the wandering of the helpless, delicate larva in search of hibernating quarters. The cocoon is ovate, of silken threads, more or less agglutinated, thin, and delicate. The life history of *Pontania pisum* Walsh, illustrated in figure 7 (p. 33), is typical of the genus.

The fact noted above, of the habit of the larvæ of entering wood, pith, or other like dry material to pupate, probably explains records made by Walsh and others of certain species which have been designated as inquilinous, either in the galls of other Nematines or in cecidomyiid galls. I am convinced that these records are all doubtful, and that the larvæ of these insects, on abandoning their own galls, had simply entered the others for hibernation. The fact that a species had been reared from a cecidomyiid gall, for instance, was taken as sufficient evidence that it was inquilinous, and a new species was erected. This is illustrated in the case of *Nematus hospes* Walsh, which is said by the describer to be "absolutely indistinguishable from the normal type, the gall-making *Nematus s. pomum*." This species was reared from a gall of *Cecidomyia s. strobiloides* O. S. It is unquestionably identical with *pomum*, and in fact I have recently received from Cornell University two specimens undoubtedly of *pomum*, labeled as having been reared from the cecidomyiid gall referred to. The same is true of *Nematus inquilinus* Walsh, which was reared from the gall of *Cecidomyia rhodoides* Walsh. This species is identical with *Pontania desmodioides* Walsh, and the larva had merely entered the cecidomyiid gall to hibernate.[2]

In going over the material of the Entomological Society of Philadelphia, the accumulations of the United States National Museum, the

[1] See "Final Moulting of Tenthredinid Larvæ," Proc. Ent. Soc. Wash., vol. II, p. 115.

[2] *Nematus mendicus* Walsh, which was reared from deserted galls of *pomum* and from the leaf galls of *Cecidomyia brassicoides* Walsh, belongs to the genus *Pteronus*. The larvæ apparently entered the galls in question to hibernate, and, with very little doubt, developed exposed on the leaves, as is the case with the other species of *Pteronus* living on willow. *Nematus fur* Walsh, which was bred from the gall of *Cecidomyia batatas* Walsh, seems also not to be a *Pontania*. The type specimen can not be found, but on the authority of Norton it is probably identical with *Nematus luteotergum*, which would bring it within the genus *Amauronematus*.

material submitted by Mr. Gillette, and the Cornell University material, I find 26 good species represented, covering localities practically embracing all temperate America. Of these 8 have been reared from or associated with galls, and two galls are described from which adults have not yet been obtained. The genus is a very difficult one, and the species are, on account of their small size and general similarity, difficult of separation. They are closely related to the following genus (*Pteronus*), and the males in particular are, in some instances, distinguished with difficulty from *Pteronus*. With the females the shape of the sheath furnishes an excellent character for the division of the genus into four groups, and structural characters are available for the ready separation of most of the species. The males, however, are separated with greater difficulty, and frequently where in the other sex two species are most divergent the males are indistinguishable except in comparatively trifling colorational details. Dissection of the sexual organs would probably yield good characters, but this is impossible without destroying the specimens, and would not be practicable for the ordinary student. With the males, therefore, separation of the species is based largely on colorational features. In most cases where males have been associated with females, breeding records are the authority for such references. In general, the males agree with the females in possessing the short, slender, filiform antennæ characteristic of the genus. Two species only, so far as known to me, have very elongate antennæ, and the rather robust, flattened antennæ characteristic of the males of some of the allied genera are very rare in *Pontania*.

In recharacterizing the old species, I have had the specimens themselves before me and have not used the original descriptions at all. Therefore, and particularly in the case of Walsh's species, which were characterized from fresh or living specimens, some divergences in the matter of coloring will be noted by comparison. In general, it may be said that what in the living or fresh specimens is hyaline or greenish white becomes yellow or even ferruginous with drying and age. It seems to me desirable to use the comparatively permanent color characters presented by the dry specimens rather than the transitory coloring of the newly emerged insect.

A number of parasites and inquilinous insects of other orders have been reared from the galls, but it is not definitely ascertained in every case whether the hosts of the former are the gall makers or the inquilinous insects. Mr. Walsh reared a little curculionid, *Anthonomus sycophanta* Walsh, from the galls of *pomum*, *desmodioides*, and *Euura nodus* Walsh. A small tineid, *Batrachedra s. pomonella* Clem., was reared by Walsh from the galls of *pomum*, *desmodioides*, and a cecidomyiid gall, *C. s. rhodoides*. The Department rearings from galls include a dipterous insect, undetermined, and two chalcidids, one a species of *Sympiesis* and the other *Eurytoma studiosa* Say, both probably parasitic on *Anthonomus sycophanta*, which was reared from the same galls.

*Bassus euurœ* Ashm. has been reared from *Pontania resinicola*, and *Pimpla euurœ* Ashm. from *Pontania pyriformis*. These last are undoubtedly parasitic upon the larvæ of the gall makers.

TABLE OF SPECIES.

*Females.*

Sheath broad at base, sharply acuminate at tip, and emarginate beneath ..... I
Sheath as above, except that the tip is obtusely rounded ..... II
Sheath broad and rounded at tip, scarcely tapering ..... III
Sheath narrow, elongate, regularly tapering to somewhat pointed tip ..... IV

I. Color in general black.
Head, thorax, abdomen, and femora black; tegulæ and mouth parts pale. 1. *cressoni* n sp.
Same, except that angles of pronotum are yellow and the femora are pale laterally ..... 2. *parra* Cr
Same, except that pronotum and legs are whitish and the orbits are broadly yellow except on narrow inner margin ..... 3. *nigrita* n. sp.
Same as last, except that orbits are entirely yellow; antennæ yellow beneath and sheath but slightly emarginate ..... 4. *pallicornis* Nort.
Color in general luteous.
Claws very minutely cleft at tip.
Central lobe of metanotum black; outer veins of posterior discals not interstitial ..... 5. *agilis* Cr.
Central lobe pale; outer veins interstitial ..... 6. *mellina* Cr.
Claws coarsely notched ..... 7. *nevadensis* Cr.
II. Color black ..... 8. *excavata* n. sp.
Color in general resinous.
Frontal crest well developed.
Stigma broad, rounded on lower margin.
Crest bulbous; pectus pale ..... 9. *resinicola* n. sp.
Crest narrow; pectus black ..... 10. *pectoralis* n. sp.
Stigma narrow, acuminate ..... 11. *acuminata* n. sp.
Frontal crest obsolete ..... 12. *robusta* n. sp.
III. Color in general black.
Orbits black; stigma narrow elongate ..... 13. *kincaidi* n sp.
Orbits broadly yellow; stigma brown ..... 14. *pisum* Walsh.
Orbits posteriorly yellow; stigma yellow ..... 15. *bruneri* n. sp.
Color in general resinous.
Mesonotum black, except scutellum; sheath broad, paddle shaped. 16. *pacifica* n. sp.
Mesonotum mostly pale; sheath somewhat blade shaped. 17. *pomum* Walsh.
IV. Clypeus nearly truncate, or very broadly and shallowly emarginate.
Pronotum and venter of abdomen black.
Tegulæ black ..... 18. *atra* n. sp.
Tegulæ pale ..... 19. *hyalina* Nort.
Pronotum and venter of abdomen pale ..... 20. *truncata* n. sp.
Clypeus distinctly and more narrowly emarginate.
Dorsum of thorax and abdomen black.
Orbits black, or rarely slightly reddish brown.
Venter of abdomen black ..... 21. *atriventris* n. sp.
Venter of abdomen pale ..... 22. *californica* n. sp.
Orbits broadly yellow.
Stigma and costa brown ..... 23. *gracilis* n. sp.
Stigma and costa hyaline ..... 24. *stigmatalis* n. sp.

Dorsum of thorax and abdomen marked with yellow.
Orbits, scutellum, and lobes of thorax more or less yellow; robust species ..... 25. *desmodioides* Walsh.
Same, with yellow transverse bands on abdomen, and venter altogether yellow ..... 26. *sulphurea* n. sp.

*Males.*

Antennæ as long as or longer than the body of the insect.
Claws very minutely divided ..... 5. *agilis* Cr.
Claws coarsely notched ..... 7. *nevadensis* Cr.
Antennæ not often exceeding one-half the body in length.
Black species.
Orbits black, rarely slightly rufous posteriorly.
Pronotum black; stigma short, robust ..... 22. *californica* n. sp.
Pronotum black; stigma elongate, narrow ..... 13. *kincaidi* n. sp.
Pronotum with pale margins.
Lateral walls of ocellar basin rounded or subobsolete.
Third and fourth joints of antennæ of equal length.
Hind femora pale ..... 9. *resinicola* n. sp.
Hind femora more or less dark ..... 2. *parva* Cr.
Third joint longest ..... 27. *rugulosa* n. sp.
Lateral walls of ocellar basin sharply defined ..... 8. *excavata* n. sp.
Orbits yellow; body black dorsally.
Venter of abdomen, except centrally, black; vertex hairless, shining. 14. *pisum* Walsh.
Venter with vertex clothed with yellowish hairs. 25. *desmodioides* Walsh.
Venter of abdomen altogether pale.
Epimera black.
Outer angles of pronotum pale ..... 17. *pomum* Walsh.
Pronotum altogether pale ..... 4. *pallicornis* Nort.
Epimera pale.
Body robust; stigma pale ..... 12. *robusta* n. sp.
Body elongate; stigma brown.
Claws very minutely cleft at extreme tip. 28. *placenta* Nort.
Claws coarsely notched ..... 29. *pallifrons* Cr.
Resinous; vertex, mesonotum, metanotum, and basal abdominal segments centrally black ..... 26. *sulphurea* n. sp.

*Table of galls.*

Galls springing from lower side of leaf.
Conical or pear shaped ..... 30. *pyriformis* n. sp.
Globular, attached minutely ..... 14. *pisum* Walsh.
Globular, broadly attached.
Singly on either side of midrib ..... 17. *pomum* Walsh.
In rows on or near midrib ..... 31. *monile* n. sp.
Galls bisecting leaf.
Singly, or rarely more than two on leaf.
Usually remote from petiole; averaging three-eighths inch long; on *Salix longifolia* ..... 15. *bruneri* n. sp.
Near or joining petiole; averaging one-half inch long.
Approaching shape of seed of Desmodium:
On *Salix californica?* ..... 22. *californica* n. sp.
On *Salix humilis?* ..... 25. *desmodioides* Walsh.
On *Salix* sp. ..... 2. *parva* Cr.
More robust, approaching globular ..... 23. *gracilis* n. sp.

Many together on leaf.

Paired at base of blade of leaf; extending from middle to edge. 9. *resinicola* n. sp.

Distributed irregularly along blade on either side of midrib, rarely on edge of leaf..... 19. *hyalina* Nort.

INDEX TO SPECIES OF PONTANIA.



**1. Pontania cressoni** new species.

*Female.*—Length 4.5 mm.; not very robust; clypeus deeply emarginate; lobes small, pointed; ocellar basin distinctly defined, breaking rather broadly into prominent antennal fovea; antennæ normal, third joint a little longer than fourth; sheath acuminate, emarginate beneath; claws deeply cleft; venation normal, except that outer veins of discal cells of posterior wings are interstitial. Color black, shining, including pronotum, orbits, and femora; tegulæ, mouth parts, tibiæ and tarsi pale, more or less infuscated, especially at tips of posterior tibiæ and their tarsi; wings nearly hyaline; stigma and costa brown, the former hyaline at base.

One female, Washington. (Coll. Am. Ent. Soc.)

**2. Pontania parva** Cresson.

1880. *Nematus parvus* Cresson. Trans. Am. Ent. Soc., VIII, p. 5.

*Female.*—Length 3.5 to 4 mm.; not robust; clypeus shallowly and broadly exavated; lobes short, minute; mouth parts with very long and rather numerous light hairs; lateral furrows of vertex very broad and deep; ocellar basin distinctly defined; frontal crest indistinct, broken by the broad, oval, deeply excavated antennal fovea; antennæ very slender, joints 4 and 5 as long as or longer than 3; sheath strongly acuminate at tip, circularly emarginate beneath, rounded above; cerci tapering; claws small, deeply and finely notched, rays almost parallel; venation normal. Color black, shining; mouth parts, spot beneath antennæ, outer third of pronotum, tegulæ, apices of coxæ, trochanters, and legs for the most part yellowish; upper and lower margins of femora, tips of tibiæ, particularly

posterior pair, and tips of tarsi, including all of posterior pair, reddish brown; all of legs somewhat infuscated; veins brown; basal half of stigma and extreme base of costa pale; in some specimens the legs beyond the trochanters are altogether light, except posterior tibiæ and tarsi.

*Male.*—Length 3.5 mm.; agrees with the female in general structure and colorational characters; lateral walls of ocellar basin more flattened and rounded; the stigma uniformly brownish; the antennæ distinctly fulvous beneath.

*Gall.*—Length 8 mm.; breadth 6 mm. Of type of *desmoïdes*, but rather smaller and projecting most on lower surface of leaf. In the specimen examined, two occur on the leaf, one on either side of the midrib, and each extends from the latter to the margin of the leaf. Surface, especially lower, tuberculate and rosy. Exit hole of adult on lower side, just at surface of leaf and at end next to petiole.

Ten females.—Nevada 4, California 3, Oregon 2, and Arizona and Montana 1 each. (Coll. Am. Ent. Soc.) Also one specimen collected by T. Kincaid at Olympia, Wash. (Coll. Cornell Univ.) One male from California. (Coll. Am. Ent. Soc.) Galls on willow leaf collected by Mr. Ehrhorn, Mountain View, Cal. Two adults reared, which, with galls, are in collection of William H. Ashmead.

3. **Pontania nigrita** new species.

*Female.*—Length 4 mm.; clypeus circularly excavated; lobes rounded; mouth parts with rather long, whitish hairs; walls of ocellar basin distinctly defined; frontal crest somewhat broken by the very elongate, distinctly limited antennal fovea; antennæ with joints 3 to 5 subequal; sheath broad, strongly acuminate at tip; cerci robust, tapering; claws deeply notched, rays nearly equal; third cubital cell quadrate, not longer than wide; outer veins of discal cells of hind wings interstitial. Color black, shining; face below antennæ, posterior and upper orbits, most of pronotum, tegulæ, all of legs except extreme bases of posterior coxæ and extreme bases of posterior tibiæ whitish or resinous; tips of posterior tarsi and tips of cerci dusky; bases of all wing veins reaching the body and extreme base of stigma light; balance of veins brown.

One female. Michigan. (Coll. U. S. Nat. Mus.)

4. **Pontania pallicornis** Norton.

1861. *Nematus pallicornis* Norton. Boston Proc., VIII, p. 160.
1867. *Nematus pallicornis* Norton. Trans. Am. Ent. Soc. I, p. 203 (Cat., etc., p. 65).

*Female.*—Length 5 mm.; somewhat robust; clypeus circular and moderately broadly notched, lobes small; mouth parts with scattering whitish hairs; vertex roughened; ocellar basin distinctly defined; frontal crest strongly developed, very slightly broken by the antennal fovea,

which is oval and not deeply excavated; antennæ short, scarcely tapering; sheath rather broad, acuminate, but not very sharply pointed, hairs rather long and abundant; cerci pointed; claws very large, deeply cleft; venation about normal; intercostal vein nearly at right angles with costa, and outer veins of discal cells of hind wings interstitial, or nearly so. Color black, shining; face below antennæ, orbits, mouth parts, angles of pronotum, tegulæ, and legs, except extreme bases of coxæ, yellowish ferruginous; antennæ ferruginous beneath, especially toward apex; veins light brown; base of stigma and base of costa pale; abdomen inclined to rufous beneath.

*Male.*—Length 4.5 mm.; antennæ much longer and antennal fovea somewhat narrower than in female; tip of abdomen strongly recurved; color as in female, except that bases of posterior coxæ only are black, and the abdomen ventrally with more or less of the apex of the last dorsal segment is yellowish ferruginous. The antennæ also are almost altogether yellowish, except scape and basal joints of the flagellum above.

Five females and five males. Illinois, Texas, and New Hampshire. (Colls. Am. Ent. Soc. and U. S. Nat. Mus.)

5. **Pontania agilis** Cresson.

1880. *Nematus agilis* Cresson. Trans. Am. Ent. Soc., VIII, p. 9.

*Female.*—Length 5 mm.; very robust; clypeus broadly and shallowly excavated; lobes minute, rounded; vertex elevated, but with ocellar basin not very distinctly limited; ridges rounded; frontal crest not distinctly raised; antennal fovea circular, shallow; claws very minutely and microscopically cleft at extreme apex; sheath strongly acuminate, broad basally; cerci tapering; venation normal. Color yellowish ferruginous, resinous, shining; antennæ, spot including ocelli, small circular spot on occiput, stripe on each of the lobes of mesothorax, base of scutellum, metathorax, more or less of first segment of abdomen, black; veins yellowish brown; stigma and costa yellow, the former edged with brown at tip.

*Male.*—Length 4 to 4.5 mm.; very slender, graceful; head and mouth parts about as in female; antennæ very long, slender, longer than entire body; claws cleft as in female. Color: Large spot on vertex, extending considerably beyond ocelli and backward over occiput, mesothorax, metathorax, abdomen, dorsally except sides of the terminal segments, scape and flagellum above, black; balance of insect, including venter, legs, lower surface of antennæ, except extreme tip, yellowish ferruginous; veins brown; stigma yellow, edged with brown.

One female and five males. Nevada and Washington. (Coll. Am. Ent. Soc.)

**6. Pontania mellina** Cresson.

1880. *Nematus mellinus* Cresson. Trans. Am. Ent. Soc., VIII, p. 10.

*Female.*—Length 5.5 mm.; very robust, shining; clypeus distinctly but rather broadly emarginate; lobes short, broad, rounded; ocellar basin deeply excavated; sides and frontal crest strongly raised, but rather thick and rounded, the former somewhat broken; antennal fovea deep, not sharply defined; antennæ scarcely longer than head and thorax, slender, joints 3 and 4 subequal; venation in general normal; intercostal very near basal; the outer veins of discal cells of hind wings interstitial; stigma not very broad, tapering from oval base circularly to apex; sheath sharply acuminate, fringed with rather long hairs; cerci long, scarcely tapering; claws very minutely notched at extreme apex. Color yellowish, tinged with ferruginous, a little darker around vertex, mesonotum, and mesepimera; antennæ, small spot about ocelli, sometimes limited to ring about each ocellus, minute spot on occiput, spot on lateral lobes of mesonotum, on either side of mesoscutellum, apex of latter, and most of metanotum except basal plates black; dorsal margin and tip of sheath brownish; veins yellowish brown; stigma and costa yellow, unicolorous.

Two females. Nevada. (Coll. Am. Ent. Soc.)

This species, though somewhat larger, is very closely allied to *agilis* Cresson.

**7. Pontania nevadensis** Cresson.

1880. *Nematus nevadensis* Cresson. Trans. Am. Ent. Soc., VIII, p. 9.

*Female.*—Length 4.5 to 5 mm.; very robust, shining; vertex slightly roughened; clypeus broadly, shallowly excavated; hairs of clypeus and labrum almost wanting; sides of ocellar basin very sharply raised; frontal crest large, distinct, unbroken; antennal fovea circular, rather deeply excavated; antennæ short, not as long as head and thorax, joint 3 very slightly longer than 4 and 5; sheath broad basally, strongly acuminate; cerci moderate, tapering; claws very large, deeply cleft. Color sulphur yellow; antennæ, quadrate spot on vertex, extending back over occiput with lines running to base of antennæ, mesonotum, metanotum, and stripe on basal segments of the abdomen becoming obsolete after the fourth or fifth segment black; spot beneath base of wings and upper margin and apex of sheath brownish black; antennæ inclined to fulvous beneath toward tips; veins yellowish brown; stigma lighter, except lower apical margin; costa lighter at base.

*Male.*—Length 4.5 mm.; very slender, graceful; antennæ nearly as long as entire body, joints 3 to 5 subequal, fourth a little longer than third; procidentia projecting about half its length; legs long; claws not very large, but deeply cleft. Color resinous yellow, inclined to ferruginous on the thorax beneath; antennæ above at base and scape,

large spot on vertex extending over occiput, mesonotum, metanotum, broad stripe on each dorsal segment of abdomen, not extending to lateral or posterior margin, black, inclining to brown on abdomen; veins light yellowish brown; stigma almost hyaline.

Three females and three males. Nevada, California, Montana, and Vancouver Island. (Colls. Am. Ent. Soc. and U. S. Nat. Mus.)

The male from Montana was placed by Cresson with his types of *agilis*, from which it is easily separated by the character of the claws, and from general structural characters may be safely referred to *nevadensis*.

8. **Pontania excavata** new species.

*Female.*—Length 4 mm.; moderately slender, glistening; clypeus narrowly and rather deeply incised; lobes rounded; mouth parts with rather long hairs; walls about ocellar basin distinctly defined; frontal crest widely broken by the extension of the shallow antennal fovea posteriorly into ocellar basin; antennæ short, joints 3 to 5 subequal, third slightly longest; sheath rather robust, strongly convex on upper margin and distinctly excavated on lower, acuminate but not sharply pointed, hairs long, scattering; claws deeply divided, rays equal and scarcely divaricating; intercostal vein nearly interstitial with basal, very slightly inclined; second recurrent interstitial with second transverse cubital. Color black; mouth parts, extreme angles of pronotum, tegulæ, tips of coxæ, and balance of legs for the most part resinous; upper and lower edges of femora, tips of posterior tibiæ, and tips of tarsi, extending on the posterior pair to the tip of the basal joint, brownish; antennæ somewhat lighter beneath, especially toward tip; veins yellowish brown; stigma at base and costa at base and apex hyaline.

*Male.*—Agrees in general with the female; ocellar basin even more sharply defined and the frontal crest unbroken; venation normal. Color as in female, except that the legs are lighter and the central portion of the abdomen beneath is inclined to yellowish; antennæ distinctly fulvous beneath; joints long, nodose at tips.

Four females and one male. California, Colorado (C. P. Gillette), and Veta Pass, Colo. (Colls. U. S. Nat. Mus. and Am. Ent. Soc.)

9. **Pontania resinicola** new species.

*Female.*—Length 5.5 mm.; rather robust; clypeus deeply, angularly emarginate; lobes triangular, rounded at tips; mouth parts with very few and inconspicuous hairs, shining; frontal crest very broadly and bulbously elevated, semicircular, shallowly notched at center; ocellar basin not distinctly limited laterally, or lateral walls wanting; antennal fovea elongate; antennæ short, filiform, third joint longest; claws deeply bifid, rays nearly parallel; sheath moderately broad, very slightly sinuate on lower margin, tapering regularly to apex, armed

with rather long, curved hairs; cerci long, slightly tapering; upper discal cell of hind wings usually much shorter than lower and terminating within apex of latter. Color resinous yellow; quadrate spot on vertex, broad stripe on dorsum of thorax extending to scutellum, metanotum and more or less of basal segments of abdomen centrally decreasing posteriorly, and upper margin of sheath brownish-black; scape and upper half of antennæ, tips of mandibles, and balance of sheath fuscous; veins brown, costa and stigma centrally yellow.

*Male.*—Length 4 mm.; rather slender, tapering distinctly from head and thorax to tip of abdomen; structurally, as in the female, with the lateral walls of the ocellar basin perhaps even less apparent—practically obsolete. Color black, shining, including orbits; mouth parts, angles of pronotum, tegulæ, and legs brownish yellow; tips of posterior tibiæ and tarsi somewhat infuscated; antennæ beneath fulvous; veins, including all of stigma and costa, rather dark brown; wings hyaline.

*Gall.*—(Frontispiece, fig. 1.) On leaves of *Salix californica* collected by Albert Koebele at Donner, Placer County, Cal., September 5, 1885. The galls occur in clusters of two to eight on the basal portion of the leaf, beginning usually at the very apex of the petiole. They are commonly paired—if but two, one on either side, or two or four on a side, as the case may be—occasionally occurring singly. In general size and appearance the individual galls resemble those of *desmodioides*, but are rather more robust or globular, projecting equally on both sides of the leaf and occupying the leaf entirely from the midrib to the edge. Where two or more occur together, they are merged into each other, forming a compound gall. In color they are red or pink on the upper side and light yellowish green on the lower. The larva is large and rather robust, indicating a fairly good-sized insect. I have doubtfully referred the gall to *Pontania resinicola*, the largest Californian representative of the genus, although the galls from which the adults were reared by Mr. Koebele were not saved by him and the ones sent to Washington yielded only an ichneumonid parasite (*Bassus eurus* Ashm., Ins. Life, vol. III, p. 460) and a tortricid.

Two females and seven males. Albert Koebele, Los Angeles, Cal. (Coll. U. S. Nat. Mus.)

**10. Pontania pectoralis** new species.

*Female.*—Length 5 mm.; rather robust; clypeus very broadly and shallowly emarginate; frontal crest and sides of ocellar basin sharply and distinctly defined, former unbroken; antennal fovea broad oval; fourth joint of antennæ a little longer than third; claws deeply notched, rays nearly equal; sheath of ovipositor stout and broad basally, slightly emarginate on lower apical edge, tip obtusely rounded; cerci short, tapering; third cubital three times as long as wide at base; outer veins of discal cells of posterior wings nearly interstitial; stigma very broad basally, regularly tapering to pointed apex. Color

in general resinous; base of antennæ, space about ocelli, stripe on each lobe of mesonotum, apex of scutellum, metanotum, dorsal segments of abdomen, except last, extending over sides to ventral arc, large spot on pectus, and sheath, especially dorsally, brownish black; outer two-thirds of antennæ reddish brown; tips of posterior tibiæ and all the tarsi, slightly darker; wings hyaline; veins light yellowish brown; base of stigma hyaline.

One female. Algonquin, Ill. (Coll. Cornell Univ.)

11. **Pontania acuminata** new species.

*Female.*—Length 5.5 mm.; rather robust; abdomen strongly tapering from just beyond middle; clypeus rather shallowly, somewhat angularly, notched; vertex coarsely punctured and roughened; frontal crest prominent, broadly curved, almost straight; sides of ocellar basin low, but well defined; antennal fovea shallow, indistinct, expanding apically; antennal joints, 3 and 4 subequal; intercostal vein at right angles with costa; stigma very elongate, narrow, distinctly acuminate; sheath broad, slightly concave on upper margin, and decidedly produced at tip, which is obtusely pointed, and with rather dense tuft of hairs; cerci robust, but slightly tapering; claws deeply cleft, rays subequal. Color: Antennæ, spot on head back of ocelli and extending over occiput, center of lobes of mesonotum, apical half of scutellum, metanotum and basal plates, more or less of abdomen basally and centrally to apex, sheath, and sides of the metathorax black; mesepimera reddish brown; posterior tibiæ and tarsi strongly infuscated, anterior tarsi less so; body generally otherwise reddish ferruginous, somewhat infuscated; mouth parts, angles of pronotum, tegulæ and anterior legs and base of all legs, yellowish; veins, including stigma and costa nearly to base, dark brown.

One female. Michigan. (Coll. U. S. Nat. Mus.)

12. **Pontania robusta** new species.

*Female.*—Length 4.5 mm.; very robust; clypeus not very deeply emarginate, lobes broad, rounded; ocellar basin with not very distinct lateral walls, broadly uniting with very large, shallow antennal fovea, the two depressions appearing almost as one; antennæ short, joint 4 a little longer than 3; sheath short, broad, rounded at tip, emarginate beneath; venation normal, except that outer veins of posterior discal cells are interstitial; claws rather deeply cleft, rays parallel. Color in general resinous yellow, shining; antennæ above, quadrate spot on vertex, including ocelli and extending over occiput, quadrate spot on the center of mesonotum, line down center and the tip of the scutellum, together with the dorsum of the abdomen, except lateral margins, brownish black; antennæ fulvous beneath; mouth parts whitish, with the tips of the mandibles reddish brown; wings hyaline; veins brown,

costa and stigma very light, almost hyaline, the latter with narrow brown bordering line.

*Male.*—As in female, except that the occiput is infuscated and the mesothorax is entirely black.

One female and one male. Michigan and District of Columbia (?). (Coll. U. S. Nat. Mus.)

13. **Pontania kincaidi** new species.

*Female.*—Length 6 mm.; rather robust, shining; clypeus very broadly but not deeply emarginate; ocellar basin with distinctly defined walls;

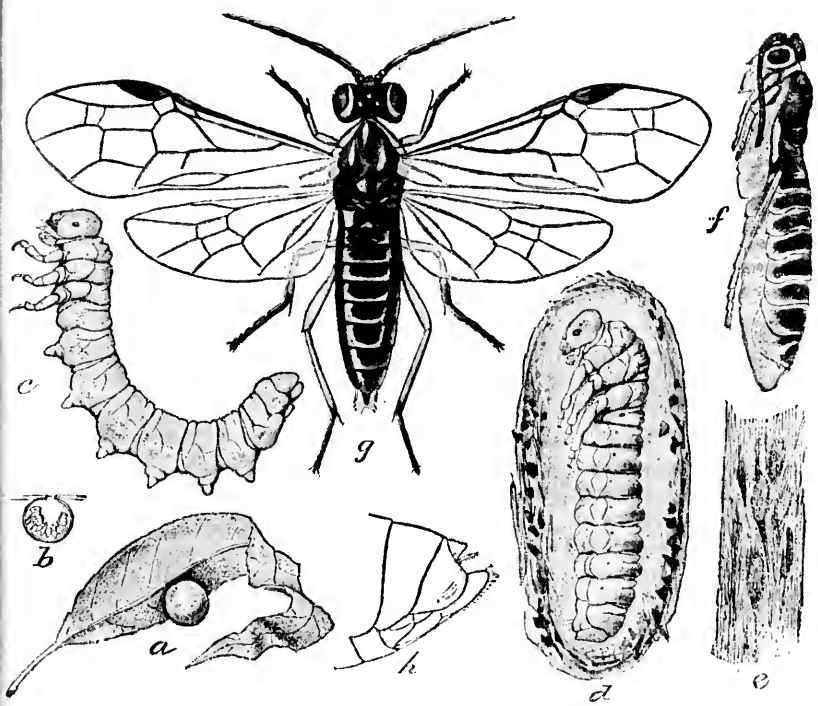



FIG. 7.—*Pontania pisum* Walsh: *a* and *b*, gall; *c*, larva; *d*, same, in contracted dormant state in cocoon; *e*, cocoons in barks, *f*, pupa; *g*, adult female; *h*, lateral view of tip of abdomen of same; *a*, *b*, and *e*, natural size; rest enlarged (original).

crest very prominent, curved forward, unbroken; antennal fovea extending laterally over base of antennæ; antennæ short, joints regularly diminishing in length from third to tip; venation normal; stigma narrow, elongate, acuminate; sheath scarcely tapering, rounded at tip; claws deeply and coarsely notched. Color black, shining; clypeus and mouth parts, extreme angles of pronotum, tegulæ and legs yellowish ferruginous, decidedly infuscated; wings hyaline or very slightly clouded; veins dark brown; stigma a little lighter toward base.

Four females. Trevor Kincaid, Olympia, Wash. (Coll. Cornell Univ.)

**14. Pontania pisum** Walsh (fig. 7.)

1866. *Nematus salicis pisum* Walsh. Proc. Ent. Soc. Phila., VI, p. 259.
1866. *Nematus quercicola* (Walsh) Cresson. Proc. Ent. Soc. Phila., VI, p. 260.
1867. *Nematus salicis pisum* Norton. Trans. Amer. Ent. Soc., I, p. 204. (Cat., etc., p. 66.)
1880. *Nematus salicis pisum* Thomas. 10th Rep. State Ent. Ill., p. 68.
1895. *Nematus pisum* Marlatt. Proc. Ent. Soc. Wash., III, p. 264.
1895. *Nematus quercicola* (Walsh) Marlatt. Proc. Ent. Soc. Wash., III, p. 266.

*Female.*—Length 4 mm.; slender, head wider than thorax; abdomen spindle shaped; clypeus rather deeply and angularly notched, lobes triangular; ocellar basin distinctly limited, lateral ridges not very sharply raised; frontal crest prominent, slightly notched at center; antennal fovea shallow, elongate; antennæ short, moderately robust, joints 3 to 5 subequal; sheath broad, very slightly emarginate beneath, rounded above, apex rounded; cerci rather long, tapering; claws deeply notched, rays subequal; third cubital cell quadrate; upper discal cell not exceeding lower. Color: Antennæ, spot on vertex extending more or less over occiput, thorax, most of abdomen, including sheath, black; orbits and face below and including frontal crest, most of pronotum, tegulæ, legs except extreme base of posterior coxæ, more or less of central portion of venter of abdomen, including all terminal segments and the terminal dorsal segment with cerci, yellowish ferruginous; tips of posterior tibiæ and tarsi infuscated; antennæ very slightly paler beneath and toward tips; veins and stigma brown; costa lighter at base.

*Male.*—Length 3.5 mm.; very slender and graceful; antennæ longer than in female and more robust; joints 3 to 5 subequal. Color black; face below frontal crest, orbits, angles of pronotum, tegulæ, legs except bases of posterior coxæ, central portion of abdomen beneath, and hypopygium yellow; veins as in female; antennæ fulvous beneath and also entirely at apex.

"*Gall.*—The gall made by it is found on *Salix discolor*. A subspherical, pea-like, hollow, pale yellowish-green gall, always growing on the underside of the leaf and almost always from one of the side veins (in one case from the midrib), and attached to the leaf by only a minute portion of its surface; 0.18 to 0.28 inch in diameter, and a few, immature, only 0.08 inch in diameter. Almost invariably there is but one gall to the leaf, but on four leaves there were two, and occasionally two are confluent. Surface in some smooth and even, without pubescence; in others a little shriveled, generally studded in the medium-sized ones with four to twelve small, robustly conical nipples, which in the larger ones have burst into a scabrous brown scar. Only in three out of sixty-two was there any rosy cheek, as in *s. pomum*. The point of attachment is marked on the upper side of the leaf by a brown subhemispherical depression.

"*Larva.*—August 25. Apparently 18-footed, no anal prolegs being visible. When at rest, it elevated its entire abdomen behind the true legs in the air. Length 0.17 to 0.23 inch; color whitish hyaline; head slightly dusky; mouth dusky; eye-spots circular and black; anal segment equal in length to two of the others and apparently divided in two by a transverse medial suture. The larva goes under ground to transform, for out of fifty galls all but three were bored, and in those, when opened, larvæ which had perished when immature were found."—Walsh, Proc. Ent. Soc. Phila., VI, p. 259.

Four females and five males. Illinois and New York. (Colls. Am. Ent. Soc. and U. S. Nat. Mus.)

Galls: Richfield Springs, N. Y., Th. Pergande, collector, September 22, 1886; adults (males) issued January 27 to February 5, 1887. East Steamburg, N. Y., E. L. Horton, collector, September 25, 1894; adult issued March 28, 1895.

15. **Pontania bruneri** new species.

*Female.*—Length 4.5 mm.; moderately robust; abdomen much broader than thorax; clypeus distinctly but broadly emarginate, lobes small; lateral walls of ocellar basin rounded, indistinct; frontal crest very slightly broken, prominent; third and fourth joints of antennæ subequal; sheath broad, scarcely tapering, somewhat obliquely rounded at tip; second recurrent interstitial with second cubital; third cubital indistinct; upper discal of posterior wings considerably shorter than lower. Color black, shining; mouth parts, posterior orbits, angles of pronotum, tegulæ, legs except bases of coxæ, brownish yellow; veins light brown; stigma and costa yellowish, the former nearly hyaline basally. The abdomen in one specimen is yellowish beneath at apex.

*Gall.*—(Frontispiece, fig. 7.) Galls occurring singly on the edges of the leaves of *Salix longifolia*, having the form and general characteristics of the gall of *P. desmodioides*. Length from 7 to 10 mm.; smooth, fleshy gall, extending from the midrib considerably beyond the narrow, linear leaf, with a prominent and distinct suture indicating what was the edge of the leaf; in color yellowish, inclined to reddish.

Three females, reared from galls collected by Lawrence Bruner on Robinson's ranch, Wyoming, September 15, 1881. The galls at this time were mostly abandoned, only six of them still containing larvæ. Adults issued between February 18 and March 3, 1882. (Coll. U. S. Nat. Mus.)

16. **Pontania pacifica** new species.

*Female.*—Length 5 mm.; rather robust; clypeus broadly, circularly emarginate, lobes medium; frontal crest very strongly developed, broken; lateral walls of ocellar basin subobsolete; antennæ with joint 3 very little longer than 4; sheath broad, not tapering, broadly rounded at tip; claws deeply cleft; venation normal, except that the upper discal does not exceed the lower. Color in general resinous; antennæ, large spot on vertex, including ocelli, occiput, mesonotum except scutellum, metanotum and the basal segment of abdomen, lower half of mesepimera, and sheath brownish black; veins dark brown; stigma somewhat lighter basally; wings very slightly infuscated.

One female. Southern California. (Coll. Am. Ent. Soc.)

**17. Pontania pomum** Walsh.

1866. *Nematus salicis pomum* Walsh. Proc. Ent. Soc. Phil., VI, p. 255.
1866. *Nematus hospes* Walsh. Proc. Ent. Soc. Phil., VI, p. 261.
1867. *Nematus salicis pomum* Norton. Trans. Amer. Ent. Soc., I, p. 216. (Cat., etc., p. 78.)
1867. *Nematus hospes* Norton. Trans. Amer. Ent. Soc., I, p. 218. (Cat., etc., p. 80.)
1869. *Nematus salicis pomum* Walsh and Riley. Am. Ent., II, p. 45.
1877. *Nematus salicis pomum* Riley. 9th Rept. Ins. Mo., p. 20.
1881. *Nematus salicis pomum* Thomas. 10th Ent. Rept. Ill., p. 68.
1882. *Nematus salicis pomum* Provancher. Nat. Can., XIII, p. 292.
1883. *Nematus salicis pomum* Provancher. Nat. Can. Hym., p. 741.
1895. *Pontania hospes* Marlatt. Proc. Ent. Soc. Wash., III, p. 266.

*Female.*—Length 5 to 5.5 mm.; very robust, shining; clypeus rather deeply, but angularly emarginate, lobes triangular, rounded; ridges of vertex about ocellar basin rounded, subobsolete; frontal crest broad, rounded, slightly notched; antennal fovea very shallow, elongate; antennæ short, not longer than head and thorax, joint 3 a little longer than 4 or 5; sheath very broad and robust, scarcely tapering, rounded at tip; cerci rather long, tapering; claws not very deeply cleft, inner ray much shorter than outer; venation normal, except that outer veins of the discal cells of hind wings are usually interstitial. Color yellowish ferruginous; antennæ, quadrate spot inclosing ocelli, with branches running to base of antennæ, stripe on center of mesonotum extending to mesoscutellum, spot on either side of scutellum and thorax posterior to same, with basal plates and narrow basal margin of the dorsal segments becoming indistinct toward tip of abdomen, and sheath brownish black; antennæ indistinctly rufous beneath toward tips; posterior tarsi slightly infuscated at tips; veins brown; stigma and costa more inclined to yellowish, former not especially lighter at base; black stripe on mesonotum is sometimes interrupted or occasionally almost wanting.

*Male.*—Length 4 mm.; more slender and elongate than female; structurally as in female, except that the antennæ are longer; joints 3 to 5 subequal. Color brownish black, shining; head and thorax opaque from rather coarse puncturing; face below base of antennæ, orbits, angles of pronotum, tegulæ, legs except bases of coxæ, and abdomen beneath yellowish ferruginous; tips of anterior tarsi and all posterior tarsi fuscous; antennæ rufous beneath, especially toward tips; wings as in female, but slightly darker.

*Gall.*—(Frontispiece, fig. 4.) The gall *s. pomum* found on *Salix cordata* and very rarely on *S. discolor*. A smooth, fleshy, sessile, globular, or slightly oval monothalamous gall, like a miniature apple, 0.30 to 0.55 inch diameter, growing on one side of the midrib of a leaf, and extending to its edge or beyond it. The principal part of the gall projects from the under side of the leaf; very rarely it is bisected by the leaf. Color greenish yellow, sometimes with a rosy cheek, especially the upper surface, and often with little dots. Fully mature July 31. An analogous gall is formed in Europe on various willows by *Nematus gallicola* Westw.

*Larva.*—May 24 it is only about 0.10 inch long; June 11 it is white, 0.10 to 0.13 inch long; July 21, 0.15 inch long; July 30, 0.15 to 0.20 inch long, pale greenish white, head pale brown. Legs freely movable. There was no earth in the jar in which the galls were placed, and most of the cocoons were spun in the galls and a few between them.—Walsh, Proc. Ent. Soc. Phila., VI, p. 255.

Six females and five males. Illinois. (Coll. Am. Ent. Soc.) Also two females (Cornell University), labeled as having been reared from gall of *Cecidomyia strobiloides.*

**18. Pontania atra** new species.

*Female.*—Length 4 mm.; slender, elongate; clypeus nearly truncate; ridges about anterior ocellus rounded or subobsolete; fovea very shallow, indistinct; antennæ slender, fourth joint distinctly longer than third; sheath slender, tapering, rounded at tip; claws with inner ray considerably shorter than outer, not very deeply notched; stigma narrow, elongate. Color shining black, including mouth parts, pronotum, and tegulæ. Trochanters, apical half of femora, tibiæ, and tarsi inclined to pallid, but strongly infuscated. Veins, including stigma, very dark brown.

One female. Michigan, April 21. G. C. Davis, collector. (Coll. U. S. Nat. Mus.)

**19. Pontania hyalina** Norton.

1864. *Messa hyalina* Norton. Proc. Ent. Soc. Phila., III, p. 8.
1867. *Messa hyalina* Norton. Trans. Am. Ent. Soc., I, p. 222. (Cat., etc., p. 84.)

*Female.*—Length 4 mm.; moderately robust, shining; clypeus very shallowly, if at all, excavated, almost truncate; vertex nearly smooth; ridges indistinct, rounded; antennal fovea very large and deep, nearly circular; antennæ somewhat longer than head and thorax, slender, scarcely tapering, third joint very much longer than fourth, third to fifth joints nodose at apex; sheath very elongate, narrow, tapering regularly to tip, more than half as long as abdomen; claws deeply cleft, rays subequal; outer veins of discal cells of hind wings and usually second recurrent and second transverse cubital interstitial; third cubital cell quadrate. Color black; tips of clypeus, labrum, mouth parts, extreme angles of pronotum, tegulæ, legs except extreme bases of coxæ, yellow; tips of posterior tibiæ, their tarsi, and the cerci dusky; upper and lower edges of femora sometimes infuscated; veins yellowish brown; basal half of stigma hyaline.

*Gall.*—(Frontispiece, fig 2.) Fleshy galls, occurring in two parallel rows, one on either side of the midrib, sometimes touching but not originating from the latter, and rarely extending to the edge of the leaf; sometimes as many as twenty on a single leaf; in other cases confined to a row on one side of the leaf, or occasionally occurring singly; shape irregular, elongate-ovate, projecting equally on both surfaces of the leaf; length 7 to 10 mm., the abortive ones smaller. Color on upper side more or less brownish red; beneath white, with slight purplish tinge. The galls result from the punctures of the females in the very tenderest leaves, the wound closing and becoming invisible. The eggs and larvæ are subject to the attacks of mites, Thrips, a curculionid (*Anthonomus sycophanta* Walsh), and a lepidopterous larva which eats out the entire interior of the gall, tenthredinid larva and all.

Many specimens. New Hampshire, New York, Massachusetts, Pennsylvania, New Jersey, and Canada. (Colls. Am. Ent. Soc. and U. S. Nat. Mus.)

Galls: Boscawen, N. H., C. V. Riley, collector, July 16–25, 1883, "on *Salix fragilis*, a large tree, 50 to 70 feet high, with a rough bark and trunk, smooth branches, and galls very plentiful on younger leaves all over the tree." The adults were obtained between April 29 and May 21, 1884; also chalcidid and other parasites.

Magnolia, Mass., July 19, 1883; gallmaker not reared. Hymenopterous parasites issued July 20, 1883.

Richfield Springs, N. Y., Theo. Pergande, collector, February 8, 1886; adults issued March 3 to April 21, 1887; also chalcidid parasites and a dipterous guest fly.

Pittsburg, Pa., J. C. Leach, collector, July 25, 1891.

Pointe au Pic, Quebec, Canada, E. Corning, collector, August 28, 1891.

20. **Pontania truncata** new species.

*Female.*—Length 4 mm.; moderately robust; clypeus almost squarely truncate, scarcely excavated; ridges about ocellar basin and frontal crest rounded, almost obsolete; antennal fovea large, circular; antennæ scarcely tapering, not longer than the head and thorax; claws not very deeply notched, inner ray considerably shorter than outer; sheath narrow, elongate, not acuminate, rounded at tip; venation normal. Color black, shining; clypeus, mouth parts, angles of pronotum, tegulæ, venter of abdomen, and legs, except bases of posterior coxæ, yellowish ferruginous; sheath brownish at apex and on margin; antennæ fulvous beneath, except on scape and first joint of flagellum.

One female. Southern California. (Coll. Am. Ent. Soc.)

21. **Pontania atriventris** new species.

*Female.*—Length 4.5 mm.; moderately robust; clypeus distinctly emarginate, lobes minute, pointed; frontal and lateral ridges of vertex rounded, subobsolete; antennæ with joints 3 to 5 subequal, fourth joint slightly longest; sheath narrow, elongate, tapering; claws deeply cleft; venation normal. Color black, shining, including orbits and venter of thorax and abdomen; legs beyond coxæ yellowish brown; femora darker, with upper and lower edges and the tips of posterior tibiæ and tarsi infuscated; clypeus and mouth parts pale; wings hyaline; veins brown; basal half of stigma hyaline.

Three females. Mount Hood, Oreg. (Coll. Am. Ent. Soc.)

22. **Pontania californica** new species.

*Female.*—Length 4.5 mm.; moderately robust; clypeus rather deeply and not broadly excavated, lobes rounded; head rather strongly punctured; ridges about ocellar basin not well defined; antennal fovea broad,

circular, shallow, breaking through rudimentary frontal crest; antennæ short, not as long as head and thorax, scarcely tapering; sheath very narrow, elongate, not acuminate, rounded at tip; inner ray of claw considerably shorter than outer; venation normal. Color black, shining; labrum, mouth parts, angles of pronotum, tegulæ, legs except bases of posterior coxæ, abdomen beneath, except sheath, yellowish ferruginous; sheath brownish rufous, smooth, shining; antennæ with flagellum inclined to rufous beneath; veins brown, stigma and costa paler basally; tarsi somewhat infuscated.

*Male.*—Length 4 mm.; structurally agrees with female; also colorational characters, except that the pronotum is entirely black, coxæ altogether black, and the venter of abdomen yellowish brown centrally, including hypopygium.

*Gall.*—Gall of the type *desmodioides*, not differing in the dried specimens in any noticeable manner from the latter. Length 8 to 12 mm. Normally but one gall occurs on a leaf. The galls were received from Mr. H. T. Turner, Eastlake, Cal., August 26, 1883, and the adults issued between September 18, 1883, and March 24, 1884.

Nine females and 3 males, 8 of which—6 females and 2 males—were reared from willow-leaf galls collected by Mr. Turner in California. (Coll. U. S. Nat. Mus.)

One male collected at Alameda, Cal., in March by Mr. Koebele, and the others collected in Southern California. (Colls. U. S. Nat. Mus. and Am. Ent. Soc.)

23. **Pontania gracilis** new species.

*Female.*—Length 5 mm.; slender, elongate species; abdomen centrally considerably broader than thorax; head very much narrower than thorax; clypeus distinctly, circularly emarginate; ridges of vertex rounded, subobsolete; frontal crest broken; antennæ with joints 3 to 6 subequal, fourth slightly longest; sheath elongate, narrow, tapering; claws deeply cleft; venation normal. Color in general black, shining; orbits, face beneath antennæ, pronotum, tegulæ, legs, and venter of abdomen reddish yellow; wings hyaline; veins, including all of stigma, dark brown.

*Gall.*—Galls somewhat similar to *desmodioides*, but much more robust, nearly spherical, extending from midrib to considerably beyond edge of leaf; diameter 9 to 13 mm.; surface smooth.

Galls collected in Virginia by Mr. Pergande September 29, 1885; adults issued April 19 and 29, 1886.

Two females. Virginia. (Coll. U. S. Nat. Mus.)

24. **Pontania stigmatalis** new species.

*Female.*—Length 4 mm.; robust; clypeus distinctly but rather broadly and circularly emarginate, lobes small, pointed; ridges of vertex sub-

obsolete; antennal fovea shallow, uniting more or less with the slight depression about anterior ocellus; antennæ very slender, rather elongate for the genus, joints 3 to 5 subequal; sheath long, narrow, regularly tapering to rather acute tip; venation normal; claws deeply cleft, rays subequal. Color black, shining; mouth parts, angles of pronotum, tegulæ, and legs, including tips of coxæ, whitish; upper and lower margins of femora are narrowly dark brown and the tips of the tibiæ and tarsi, particularly posterior pair, brownish; the posterior orbits are reddish yellow; wings hyaline; veins light brown, costa and stigma hyaline.

One female. Mount Hood, Oreg. (Coll. Am. Ent. Soc.)

25. **Pontania desmodioides** Walsh.

1866. *Nematus salicis desmodioides* Walsh. Proc. Ent. Soc. Phila., VI, p. 257.
1866. *Nematus inquilinus* Walsh. Proc. Ent. Soc. Phila., VI, p. 260.
1867. *Nematus salicis desmodioides* Norton. Trans. Am. Ent. Soc., I, p. 211. (Cat., etc., p. 73.)
1867. *Nematus inquilinus* Norton. Trans. Am. Ent. Soc., I, p. 213. (Cat., etc., p. 75.)
1878. *Nematus inquilinus* Provancher. Can. Nat., X, p. 57.
1883. *Nematus inquilinus* Provancher. Faun. Ent. Can. Hym., p. 190.
1895. *Pontania inquilina* Marlatt. Proc. Ent. Soc. Wash., III, p. 266.

*Female.*—Length 5 mm.; rather robust; head and thorax strongly punctured, somewhat opaque; clypeus deeply and narrowly emarginate, lobes rounded; ocellar basin well defined, side walls thick; frontal crest large, slightly notched; antennal fovea elongate, deeply excavated; claws rather deeply and evenly cleft; sheath narrow, long, regularly tapering, scarcely excavated beneath; cerci slender, tapering; wings with normal venation, except that the third cubital cell is nearly quadrangular. Color of antennæ, large spot including ocelli, stripe on anterior lobe of mesonotum, band in front of scutellum, most of metanotum, and abdomen dorsally except sides and apex dark brown, approaching black (mesonotum sometimes nearly altogether black, except scutel); occiput, balance of mesonotum, and the mesepimera reddish brown, inclined to resinous; face, orbits, pronotum, scutellum, abdomen beneath, and legs yellowish ferruginous; veins and stigma yellowish brown, the former scarcely lighter basally.

*Male.*—Length 4 mm.; structurally about as in female; vertex with numerous yellowish hairs; the ocellar basin less distinctly defined and the antennal fovea more triangular and deepening anteriorly; venation as in female, except that the intercostal vein is posterior to basal. Color brownish black; spot beneath antennæ, clypeus, mouth parts, lower and inner orbits, pronotum, tegulæ, legs for the most part, broad stripe on venter of abdomen and dorsal apex of same, yellowish; posterior tarsi infuscated; posterior orbits reddish yellow, fuscous; veins yellowish brown; stigma unicolorous.

*Gall.*—The gall is found on *S. humilis*. It is smooth, flattish, fleshy, sessile, yellowish green, monothalamous, semicircular in general shape like the seed of a Desmodium

of the quarter of an orange. It is about equally divided between the two surfaces of the leaf; no rosy cheek. Generally there is but one gall on a leaf; one leaf was seen with three upon it. Length 0.23 to 0.50 inch. One hundred and thirty-one specimens. Gall mature July 30.

*Larva.*—Three or four of these July 30, did not apparently differ from those of *S. pomum* examined the same day. When the larva quits feeding in the gall, there remains nothing of it but a shell as thin as paper. All the imagoes bred pupized inside the gall, but there was no earth within the breeding vase.—Walsh, Proc. Ent. Soc. Phila., VI, p. 257.

Two females, a bred specimen from Illinois (Walsh's type?) and a collected specimen from Massachusetts, and one male (Walsh's type?) apparently reared with the female described above. (Coll. Am. Ent. Soc.)

*Nematus inquilinus* Walsh is unquestionably identical with this species.

Galls probably belonging to this species have been received from the following localities: Lafayette, Ind., F. M. Webster, August 15, 1890, from which were obtained two parasites, *Sympiesis* sp. and *Eurytoma studiosa* Say, supposed to be parasitic on *Anthonomus sycophanta* Walsh; Richfield Springs, N. Y., Th. Pergande, collector, September 28, 1886. Cadet, Mo., J. G. Barlow, collector, September 24, 1890.

**26. Pontania sulphurea** new species.

*Female.*—Length 4 mm.; rather slender, glistening; head and thorax somewhat coarsely punctured; clypeus circularly emarginate, lobes triangular; ridges of vertex inclosing ocellar basin present, but not distinctly defined; frontal crest small; antennal fovea very shallow, almost wanting; antennæ scarcely as long as head and thorax, filiform, joints 3 and 4 subequal; sheath very narrow, elongate, tapering toward rounded tip; claws large, deeply notched; outer veins of discal cells of hind wings interstitial; cerci very short, tapering rapidly from base. Color sulphur yellow; antennæ, quadrate spot on vertex inclosing ocelli, large spot on each of anterior lobes of mesonotum, the post scutellum and two or three spots on the succeeding sclerite, band on basal plates, and on proximal segments of abdomen brownish black, lighter on abdomen; antennæ fulvous beneath, dusky toward tips; sheath edged with brown on the dorsal and apical margins; veins light yellowish brown; stigma and costa lighter basally.

*Male.*—Agrees in general characters with the female. The dorsum of thorax is black, and the basal segments of the abdomen are black centrally, forming a narrow dark stripe extending more than half way to the tip of the abdomen.

One female and one male. Montana and Nevada. (Coll. Am. Ent. Soc.)

**27. Pontania rugulosa** new species.

*Male.*—Length 4 mm.; rather slender; head roughened, coarsely punctured, thorax with finer puncturing; clypeus deeply, narrowly emarginate, lobes triangular; lateral walls of ocellar basin indistinct or

wanting; frontal crest sharply defined, prominent, slightly notched in the center; antennal fovea very minute, almost wanting, circular; antennæ longer than head and thorax, joints 3 and 4 subequal, joints 3 to 5 nodose at tips; procidentia projecting more than its width beyond terminal segment; hypopygium narrow, rounded at tip; claws deeply cleft; third cubital cell very short, quadrate; upper discal cell of hind wing not exceeding lower. Color black; clypeus, mouth parts, angles of pronotum, tegulæ, hypopygium, and legs, except bases of coxæ, yellowish ferruginous; tips of anterior tarsi faintly and tips of posterior tibiæ and their tarsi more strongly infuscated; antennæ fulvous beneath; veins dark brown; stigma unicolorous, brown; costa lighter at extreme base.

Two males, one reared (?) from willow gall. Michigan. (Coll. U. S. Nat. Mus.)

**28. Pontania placenta** Norton.

1867. *Nematus placentus* Norton. Trans. Am. Ent. Soc., I, p. 213. (Cat., etc., p. 75.

*Male.*—Length 4.5 mm.; not very robust, shining; clypeus very broadly excavated, lobes small; vertex rounded, smooth, with a deep furrow beyond lateral ocelli; ridges limiting ocellar basin wanting or indistinct, as also frontal crest; antennal fovea large, very shallow, indistinctly limited; antennæ slender, not much longer than head and thorax; claws microscopically cleft at apex; procidentia not or scarcely projecting. The following veins are interstitial: Intercostal with basal, second recurrent with second transverse cubital and outer veins of discal cells of posterior wings. Color of antennæ, large spot on head about ocelli, occiput, mesonotum and metanotum, abdomen above except narrow lateral edge, more or less of metepisternum, and bases of posterior coxæ black; balance of body yellowish ferruginous.

One male. Canada. (Coll. Am. Ent. Soc.)

**29. Pontania pallifrons** Cresson.

1880. *Nematus pallifrons* Cresson. Trans. Am. Ent. Soc., VIII, p. 6.

*Male.*—Length 5 mm.; moderately robust; clypeus almost squarely truncate; mouth parts with short white hairs; vertex smooth, shining; ocellar basin distinctly defined; frontal crest rather large, unbroken; antennal fovea very small, circular, more deeply excavated at lower end; antennæ not much longer than head and thorax, robust and tapering; claws large, deeply divided, inner ray much shorter than outer; apex of abdomen not strongly recurved; procidentia short, strongly constricted at base, apical angles acuminate; cerci rather long, spindle shaped; venation normal, except that the intercostal vein is at right angles to costa; stigma very elongate, narrow. Color black, shining; face below ocellar basin, orbits, pronotum, tegulæ, all of venter, and legs yellowish ferruginous; metepisternum and extreme

ases of posterior coxæ brownish black; tips of posterior tibiæ and tarsi, and cerci, infuscated; antennæ unicolorous, brownish black.

One male. Cresson's type. Texas. (Coll. Am. Ent. Soc.)

30. **Pontania pyriformis** new species. (Frontispiece, fig. 5.)

*Gall.*—Galls occurring on leaves of *Salix californica* (?). Collected by Albert Koebele, Donner, Placer County, Cal., September 5, 1885. Galls occur on the underside of the leaf, attached to or near the midrib, usually singly, but sometimes two separately on the leaf, or more frequently partly coalescing, in which case one is usually abortive. They are pear-shaped, attached rather broadly (¼ to ½ greatest diameter) at the larger end, and rather acutely pointed, sometimes slightly curved at tip, or more rarely bifurcate. They consist of a mere shell, containing with the larva very little frass, as though the larva had subsisted more on secretions than on the solid interior of the gall—the gall giving now no indication of ever having been fleshy and solid. The full-grown larva escapes through the base of the gall at its point of attachment, emerging, therefore, on the upper side of the leaf. The larva is white, with light-brown head and black eye-spots, 7 to 8 mm. long. Six specimens of *Pimpla curvæ* Ashm.[1] were reared, but no gall-flies.

31. **Pontania monile** new species. (Frontispiece, fig. 6.)

*Gall.*—Gall occurring on the leaves of willow. Collected at the mouth of the American Fork Cañon, Utah, by Mr. E. A. Schwarz, June 29, 1891.

Smooth, globular, fleshy galls, 6 to 8 mm. in diameter, occurring from 2 to 6 together in a row on the underside of the midrib of willow leaf. The area of attachment is about one-half the greatest diameter of the gall, and on the upper side of the leaf appears as a slight convexity. When closely placed, the galls lose somewhat of the spherical shape, but rarely grow together. The larva begins eating out the interior of the gall near the base, and is rather robust, 10 mm. in length, with light, resinous head and dark eye-spots; light, yellowish-white body.

An exactly similar gall, except occurring 1 or 2 together, is represented in the collection, bearing the label January 10, 1884, without locality. It was collected in a later stage of development, and the interior is completely excavated. In most cases the larva had abandoned the gall, issuing near the base. The specimens probably came from the Northwest.

A gall similar to the last was also received from Mr. Lawrence Bruner, Robinson's Ranch, Wyoming, collected September 15, 1881, with the statement that it occurred on the leaves of *Populus angustifolia*. Examination of the leaves seems to indicate that they are willow rather than poplar, and the gall may be doubtfully referred to the type described above.

[1] Insect Life, III, p. 463.

## VIII. Genus PTERONUS Jurine.

Jurine, Nouvelle Méthode de Classer les Hyménoptères et Diptères, T. I, p. [illegible]
Konow, Deutsche entomologische Zeitschrift, XXXIV, 1890, Heft II, p. 237.

Body large, hard; clypeus incised at tip; claws bifid; antennæ long, frequent[ly] pale beneath; stigma usually unicolorous; mesonotum and mesopleuræ usually n[ot] or sparsely punctured; head subrotund; labium not or slightly prominent; eigh[th] dorsal abdominal segment of male subtriangular, produced at apex; procident truncate at apex; hypopygium narrow at apex and subtruncately rounded; shea[th] of female small, narrow; apex never acuminate.

The genus as characterized above by Konow is perhaps the largest [in] point of number of species of the several genera erected from the ol[d] genus *Nematus*. It is closely allied to the genus following it, but differ[s] notably in the characters of the head and wings and in the gener[al] appearance. The males of the smaller species are not so readily sepa[r]rated from the males of *Pontania*. The genus has its type species i[n] *Pteronus myosotidis* Fab., the only species remaining of those originall[y] assigned to it by Jurine. The life-history of a few of the America[n] species is familiar, as, for instance, that of *Pteronus ventralis* Say (th[e] willow sawfly) and *P. ribesii* Scop. (the gooseberry sawfly). In habit[s] the other species are for the most part probably similar to these. Som[e] confusion which has grown up with respect to some of the light-colore[d] forms is referred to in the table for the separation of the species.

TABLE OF SPECIES.

*Females.*

A. Prevailing color black; pectus always black.
  Stigma narrow, usually straight on lower margin or strongly acuminat[e] elongate, more than three times as long as wide.
    Head, thorax, and abdomen black above.
      Stigma and femora brown or black.
        Abdomen beneath black ..... 1. *vicinalis* C[ress.]
        Abdomen pale beneath.
          Orbits black ..... 2. *occidentalis* n. s[p.]
          Orbits pale ..... 3. *latus* n. s[p.]
      Stigma and femora pale ..... 4. *pacificus* n. s[p.]
    Head and thorax black; abdomen more or less pale.
      Abdomen with broad lateral pale stripe ..... 5. *limbatus* C[ress.]
      Abdomen with broad, transverse yellow band ..... 6. *latifasciatus* C[ress.]
AA. Stigma broad, rounded on lower margin, not much more than twice as long [as] wide.
    Head and thorax black; venter of abdomen pale; dorsal arcs always mo[re] or less black, except sometimes terminal ones.
      Femora black ..... 7. *ventralis* Say
      Hind femora only black ..... 8. *marlattii* Dyar
      Femora pale; orbits black or strongly infuscated.
        Coxæ black; abdomen black above, except narrow apex of som[e] of dorsal arcs ..... 9. *atriceps* n. s[p.]
        Coxæ pale; abdomen with narrow transverse brown stripes o[n] dorsal arcs, sometimes limited to basal segments, mostly pale; sheath pale ..... 10. *coloradensis* n. s[p.]

Coxæ pale; abdomen with broad central black stripe and with apex beneath strongly infuscated; sheath black.
Second recurrent interstitial with first cubital.
11. *harringtoni* n. sp.
Second recurrent received well within second cubital cell.
12. *fylesi* n. sp.
Femora pale; orbits pale or reddish.
Sheath broad, rounded or truncate at apex; stigma brown.
13. *kincaidi* n. sp.
Sheath narrow, tapering; stigma yellow ..... 14. *forcatus* n. sp.
Sheath narrow, tapering; stigma bicolorous; mesepimera with pectoral black spot..... 15. *bicolor* n. sp.
Head and thorax black; abdomen pale, except sometimes basal dorsal arc and, rarely, terminal arcs.
Hind femora black, at least apically.
Hind tibiæ with brown gradually increasing in intensity from base to tip; orbits and mouth parts pale..... 16. *tricolor* n. sp.
Hind tibiæ with basal one-third or one-half white; head black.
Elongate; basal arc black.
Terminal segments black; legs pallid and black.
17. *rufocinctus* Harrington.
Terminal segments yellow; legs reddish yellow and black.
18. *erythrogaster* Norton.
Short ovate; basal arc indistinctly or not at all infuscated.
Three terminal arcs pale..... 19. *corylus* Cr.
Three terminal arcs black ..... 20. *dyari* n. sp.
Hind femora pale.
Veins and stigma dark brown.
Angles of pronotum and the coxæ black.. 21. *fulviceps* Prov.
Angles, etc., pale.
Lateral lobes mesonotum mostly black; basal segment of abdomen infuscated..... 22. *populi* n. sp.
Lateral lobes mesonotum reddish; basal segment pale.
23. *hudsonii* Dyar.
Veins and stigma yellowish.
Orbits and spot below bases of antennæ pale.
24. *auratus* n. sp.
Orbits and spot below bases of antennæ black.
25. *californicus* n. sp.
Head and thorax more or less pale above.
Antennæ yellow or ferruginous.
Hind femora mostly black..... 26. *antennatus* n. sp.
Hind femora pale..... 27. *ribesii* Scop.
Antennæ black; legs pale..... 28. *edwardsii* Cr.

AA. Prevailing color of dorsum black; pectus and venter pale (except dusky spot on pectus of *hyalinus* and minute one in case of *rufus*, and sometimes venter of abdomen black in *militaris*).
Head altogether black.
Thorax with lateral lobes reddish; abdomen black dorsally. 29. *militaris* Cr.
Thorax and abdomen reddish, except mesoscutellum, metanotum and basal central area of abdomen ..... 30. *thoracicus* Harr.
Head black; mouth parts and orbits pale.
Stigma and costa brown.
Scutellum black.
Head nearly spherical, viewed latterly; clypeus narrowly and deeply excavated, short, robust..... 31. *odoratus* Dyar.

Head normal, triangular; clypeus rather broadly exc[illegible], cl[illegible]
gate ..... 32. *cornelli* n. s[illegible]
Scutellum pale.
Posterior tibiæ and tarsi dark brown ..... 33. *trilineatus* Nor[illegible]
Legs altogether resinous ..... 34. *magus* n. s[illegible]
Stigma and costa pale.
Scutellum entirely or for most part black.
Costa enlarged at apex; small, robust species .. 35. *quercus* n. s[illegible]
Costa normal; elongate species.
Lobes of mesonotum altogether black ..... 36. *hyalinus* n. s[illegible]
Lobes with light sutures ..... 37. *vertebratus* Sa[illegible]
Scutellum pale ..... 38. *integer* Sa[illegible]

AAA. Dorsum pale or with few black spots.[1]
Stigma pale.
Crest strongly bituberculate.
Claws normal ..... 39. *mendicus* Walsh
Claws minutely cleft ..... 40. *vancouverensis* n. sp[illegible]
Crest unbroken, straight ..... 41. *koebelei* n. sp[illegible]
Crest unbroken, curved anteriorly; stigma narrow, straight on lower mar[illegible]
gin ..... 42. *pinguidorsum* Dya[illegible]
Stigma brown; body without dark markings ..... 43. *unicolor* n. s[illegible]

*Males.*

Procidentia very broad and large.[2]
Elongate, slender; orbits black ..... 44. *longicornis* n. sp[illegible]
Short, robust; orbits reddish ..... 27. *ribesii* Scop[illegible]
Procidentia narrow; sometimes subobsolete.
Black; pectus always black.
Body altogether black, except sometimes mouth parts, pronotum, and tegul[illegible]
Legs, particularly femora and posterior tibiæ, strongly infuscated.
Ridges about ocellar basin prominent ..... 45. *iridescens* C[illegible]
Ridges about ocellar basin obsolete ..... 46. *decoratus* Pro[illegible]
Legs pale, except tips posterior tibiæ and their tarsi.
Clypeus distinctly emarginate; procidentia minute.
Stigma short, robust; apical half hind tibiæ infuscated.
47. *lombardæ* n. sp[illegible]
Stigma rather elongate, acuminate; extreme tips of hind tibi[illegible]
sharply brown.

[1] Three species of the luteus group described by Norton are distinguishable by th[illegible] color characteristics. The types are lost, with the possible exception of *trivittatus*. *Stigmatus* may prove to be a good species. *Mendicus* and *trivittatus* are closely allied, and probably identical, the older name, *mendicus*, holding. *Monochroma* may prove to be a light form of *mendicus*. These species all fall in the table with *mendicus*, with which they are closely allied. *Stigmatus* and *monochroma* may be good species, and the original descriptions of them are appended (Nos. 47 and 48). The following synopsis indicates the color differences of this group:

Dorsum pale, except tip of scutellum, metanotum, and stripe down tergum ♀ 49. *stigmatus* Nort[illegible]
Dorsum with a black spot about ocelli and three on lobes of mesonotum; body otherwise pale ..... ♀ 39. *trivittatus* Nort[illegible]
Dorsum with two spots on mesonotum, tip of scutellum, and spots on metanotum black ..... ♀ 39. *mendicus* Walsh
Insect altogether pale, including antennæ ..... ♀ 50. *monochroma* Nort[illegible]

[2] In this character the two following species depart in this sex from the characterization of the genus.

Venter black; second recurrent interstitial.
11. *harringtoni* n. sp.
Venter pale; second recurrent not interstitial.
12. *fylesi* n. sp.
Clypeus nearly truncate; procidentia long and projecting, keeled.
20. *dyari* n. sp.
Legs pale, pygidium pale ..... 48. *dubius* n. sp.
Body black, except venter of abdomen, femora, and sometimes terminal dorsal arcs.
Abdomen entirely black dorsally.
Orbits pale; mesepimera black ..... 13. *kincaidi* n. sp.
Orbits black; upper half of mesepimera pale .... 30. *thoracicus* Harr.
Abdomen with more or less of dorsal segments laterally and apically pale.
Procidentia minute, usually slightly emarginate at tip; abdomen usually nearly interrupted with yellow centrally. 7. *ventralis* Say.
Procidentia medium, rounded at tip; abdomen not as above.
10. *coloradensis* n. sp.
Black above for most part; pectus and venter pale.
Stigma and costa brown.
Dorsum, including scutellum, black.
Head nearly spherical, viewed laterally; clypeus narrowly and deeply excavated; short, robust ..... 31. *odoratus* Dyar.
Head normal, triangular; clypeus rather broadly excavated; elongate ..... 32. *cornelli* n. sp.
Dorsum black, scutellum pale ..... 41. *vancouverensis* n. sp.
Stigma and costa pale.
Procidentia as long as wide ..... 39. *mendicus* Walsh.
Procidentia twice as long as wide ..... 37. *vertebratus* Say.

INDEX TO SPECIES OF PTERONUS.

**1. Pteronus vicinalis** Cresson.[1]

1880. *Nematus vicinalis* Cresson. Trans. Am. Ent. Soc., VIII, p. 4.

*Female.*—Length 8.5 mm.; very large, robust, shining, obscured some rather dense punctuation on head and thorax; clypeus rather de ly, circularly emarginate; ridges about ocellar basin flattened, indistin frontal crest broad, slightly notched; antennal fovea shallow, indi tinct; antennæ not much longer than head and thorax, scarcely tap ing, joints 3 to 5 subequal; intercostal ver slightly, if at all, incline stigma narrow, acuminate; sheath broad, tapering, obtusely pointe cerci slender, not tapering; claws large, deeply notched, rays equ Color black; clypeus, apices of coxæ, trochanters and tibiæ except apic of posterior pair, and anterior tarsi whitish, infuscated; posterior tar with tips of posterior tibiæ, nearly black; veins very dark brown, inclu ing stigma and costa, the latter to base; tegulæ dark brown, strong infuscated; wings somewhat infuscated.

One female, Cresson's type. California. (Coll. Am. Ent. Soc.)

**2. Pteronus occidentalis** new species.

*Female.*—Length 7.5 mm.; moderately robust, shining; clype broadly and shallowly emarginate, approaching truncate; anten fovea broad, circular; antennæ distinctly tapering, not much long than head and thorax, third joint distinctly longer than fourth; upp middle cell of hind wings as long as or more commonly longer th lower; intercostal vein very close to basal vein; third cubital cell lon sides almost parallel; stigma long, narrow; sheath rather sharp pointed; claws evenly and rather finely cleft. Color black; triangul space below antennæ, tip of clypeus and the mouth parts, pronotu tegulæ, legs except middle portion of femora and tips of hind tibi and more or less of all tarsi whitish; tarsi and tips of hind tibi strongly infuscated, brownish; venter of abdomen, except tip, pal veins, including stigma and costa, dark brown; wings nearly hyalin

Nine females, three bred from willow larvæ collected in Placer County Cal., and the others collected about Los Angeles. (Coll. U. S. Nat. Mus

**3. Pteronus latus** new species.

*Female.*—Length 8 mm.; very robust and broad, viewed from abov abdomen scarcely constricted at base, sides nearly parallel; clype very broadly and shallowly emarginate; antennal fovea triangula distinctly excavated; ocellar basin well defined; frontal crest slightl notched at center; antennæ moderately robust, tapering, joints 3 and subequal; venation normal; stigma rather narrow, tapering gradual to apex; sheath broadly rounded on lower margin, pointed at ti

[1] This, with the following five species, is allied to the genus *Amauronematus* in t character of the stigma, but seem to be thrown out of the latter genus by lackin any unusual development of labium and other mouth parts, as well as other chara ters of the genus.

claws evenly but not very coarsely notched. Color black; area about bases of antennæ, orbits, and mouth parts, pronotum, tegulæ, legs for the most part, and venter of abdomen pale; femora, tips of hind tibiæ and their tarsi, brown; veins and stigma brown, wings hyaline, slightly brownish beneath stigma.

Two females. Massachusetts and Pennsylvania. (Coll. Am. Ent. Soc.)

**4. Pteronus pacificus** new species.

*Female.*—Length 6.5 mm.; robust, shining; clypeus broadly but distinctly emarginate; walls of ocellar basin distinctly defined; frontal crest unbroken; fovea deep, oval; antennæ short, slender, scarcely tapering, joints 3 to 5 subequal; venation normal, except that the third cubital cell is only about half as wide at base as at apex; stigma narrow, regularly rounded on lower margin, acuminate; sheath broad, tapering to obtuse tip; claws not very deeply notched. Color black; clypeus, mouth parts, extreme angles of pronotum, tegulæ, terminal dorsal segment, more or less of venter of abdomen, together with legs except bases of coxæ, dull resinous; posterior orbits reddish; wings hyaline; stigma light yellow; veins otherwise light brown.

Four females. Olympia, Wash. Trevor Kincaid, collector. (Coll. Cornell Univ.)

**5. Pteronus limbatus** Cresson.

1880. *Nematus limbatus* Cresson. Trans. Am. Ent. Soc., VIII, p. 8.

*Female.*—Length 7 mm.; rather short and robust, finely punctured, but shining; clypeus very slightly and broadly notched; frontal crest very prominent, broadly curved, unbroken; sides of ocellar basin strongly and sharply raised; antennal fovea small, indistinct; antennæ short, not much longer than head and thorax, tapering, third and fourth joints subequal; intercostal vein a little anterior to basal, not, or but slightly, inclined, second recurrent interstitial with second transverse cubital (in one specimen latter vein is wanting), and outer veins of middle cells of hind wings also interstitial; second and third transverse cubitals of nearly equal length; stigma elongate, narrow, terminating rather abruptly; sheath short, broad, obtusely pointed; cerci short, robust, scarcely tapering; claws deeply notched, rays about equal. Color of head, thorax, broad stripe along dorsal center of abdomen, sheath, cerci, and extreme tips of posterior tibiæ and their tarsi brownisb black; upper orbits and sides of mesonotum tinged with reddish; clypeus and mouth parts, most of pronotum, tegulæ, lateral third of dorsum of abdomen, all of venter of abdomen, and legs yellowish ferruginous; tips of anterior tarsi slightly infuscated; veins, including costa nearly to base, and stigma brown.

Two females, Cresson's types. Illinois. (Coll. Am. Ent. Soc.)

**6. Pteronus latifasciatus** Cresson.

1880. *Nematus latifasciatus* Cresson. Trans. Am. Ent. Soc., VIII, p. 7.
1886. *Nematus latifasciatus* Provancher. Add. Faun. Can. Hym., p. 24.
1895. *Nematus latifasciatus* Dyar. Trans. Am. Ent. Soc., XXII, p. 304.

*Female.*—Length 8 mm.; somewhat elongate, shining; clypeus sh
lowly and broadly emarginate, lobes short, broad; frontal crest and sid
of pentagonal area strongly raised; antennal fovea large, oval, deep
excavated; antennæ unusually slender and long, almost equaling thor
and abdomen in length, third and fourth joints subequal; intercost
oblique and almost its own length anterior to basal vein; upper cell
hind wings extending nearly one-fourth its length beyond lower; stig
narrow, elongate; sheath moderately robust, obtusely pointed, wi
straight upper margin; cerci very slender and nearly as long as seco
transverse cubital vein; claws very deeply notched, rays almost equ
Color of head, thorax with basal plates, four terminal segments of abd
men dorsally and sheath, tips of hind femora, apical half of hind tibi
hind tarsi, and extreme bases of hind coxæ brownish black; tips of an
rior tarsi dusky; tips of clypeus, labrum, bases of mandibles, palpi, a
basal half of hind tibiæ whitish; upper margin of pronotum, tegul
first four segments of abdomen dorsally except apex of fourth, all
venter, and legs yellowish ferruginous; wing veins, including cost
brown.

One female, Cresson's type. New Hampshire. (Coll. Am. Ent. Soc

Mr. H. G. Dyar has characterized the larva (l. c.) from specime
found on birch.

**7. Pteronus ventralis** Say.

1824. *Nematus ventralis* Say. Keating's Narr. Exp., II, App., p. 315.
1859. *Nematus ventralis* LeConte. Say, Ent., II, p. 211.
1861. *Nematus ventralis* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 159.
1867. *Nematus ventralis* Norton. Trans. Am. Ent. Soc., I, p. 201. (Cat., etc., p. 6
1869. *Nematus ventralis* Scudder. Ent. Corr. Harr., p. 270.
1870. *Nematus ventralis* Riley. Am. Ent. and Bot., II, p. 276.
1873. *Nematus ventralis* Sylvester. Rept. U. S. Dept. Agric., p. 254.
1881. *Nematus ventralis* Thomas. 10th Rep. Ent. Ill., 1880, p. 68.
1885. *Nematus ventralis* Forbes. 11th Rep. Ent. Ill., 1884, p. 117.
1888. *Nematus ventralis* Howard. Insect Life, I, p. 33, fig. 5.
1889. *Nematus ventralis* Lugger. Bull. 9, Minn. Exper. Sta., p. 51.
1889. *Nematus ventralis* Orcutt. Bull. 13, Dakota Exper. Sta., p. 13.
1889. *Nematus ventralis* Bruner. Bull. 14, Nebr. Exper. Sta., p. 78.
1890. *Nematus ventralis* Packard. Rep. U. S. Ent. Comm., V, pp. 524, 588.
1891. *Nematus ventralis* Orcutt. Bull. 22, S. Dak. Exper. Sta. (March).
1895. *Nematus ventralis* Dyar. Trans. Am. Ent. Soc., XXII, p. 304.

*Female.*—Length 8 mm.; only moderately robust; abdomen broade
beyond middle, shining; clypeus broadly and shallowly emarginat
lobes rounded; frontal crest large, indistinctly broken; ocellar bas
well defined; antennal fovea deep, elongate, triangular; antennæ sle
der, distinctly tapering, smooth, third joint usually slightly exceedin

fourth; upper middle cell of hind wings short, quadrate, terminating at or usually within apex of lower cell; intercostal vein very slightly inclined, interstitial, or nearly so, with basal; second recurrent interstitial, or nearly so, with second transverse cubital vein; third cubital cell not strongly divaricating apically; stigma broad, rounded beneath, widest at center; sheath pointed, slightly excavated above and rounded beneath; moderately robust; cerci robust, obtusely pointed; claws large, deeply cleft, rays subequal. Color brownish black, including dorsum generally, coxæ, femora except tips, tips of hind tibiæ, all of hind tarsi, sheath, cerci, and more or less of apex of abdomen beneath; balance yellowish white, viz, inner and outer orbits, face below base of antennæ, pronotum except two or three dusky spots (sometimes wanting), tegulæ, lateral edges of thorax and abdomen, and venter; palpi, more or less of extreme tips of fore tibiæ, and commonly some of fore tarsi dusky; wings very faintly smoky; veins, including stigma, brown, costa pale on basal half.

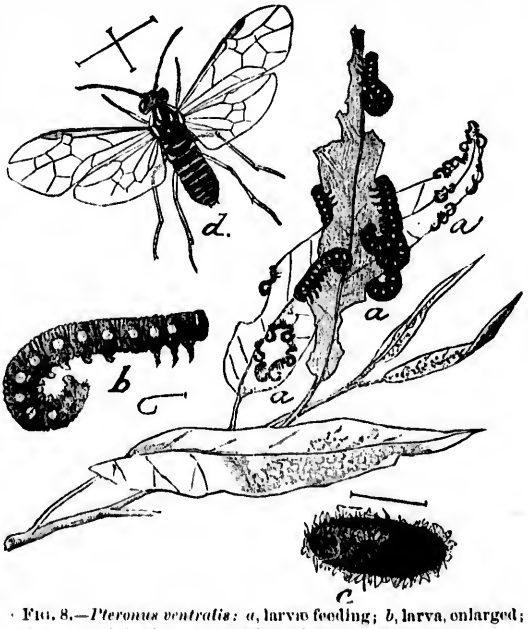



FIG. 8.—*Pteronus ventralis*: *a*, larvæ feeding; *b*, larva, enlarged; *c*, cocoon, and *d*, adult—both enlarged (from Insect Life).

*Male.*—Length 7 mm.; rather elongate; structurally as in female; procidentia as long as broad, narrow, tapering, squarely truncate or slightly emarginate at apex, constricted at base; hypopygium emarginate as viewed from end; antennæ compressed laterally, stouter than in female. Color as in female, except that the inner orbits are black and the legs are dark reddish yellow, except bases of coxæ and posterior tarsi; abdomen reddish yellow beneath and dorsally over segments 2 and 3 and less on following ones; bases of all dorsal segments dark, terminal ones particularly so; hind tibiæ very slightly infuscated, particularly at tips.

Many bred specimens of both sexes. Washington, D. C. (Coll. U. S. Nat. Mus.)

A male and a female from Carbondale, Ill. (Coll. Am. Ent. Soc.), differ from the above in that the female has the upper middle cell of the hind wings exceeding the lower, and in the male the same terminates at apex of lower. Three males from Michigan (Coll. U. S. Nat.

Mus.) vary from above in having an elongate upper middle cell in hi
wings, which, however, does not exceed lower, and in that the int
costal is a little anterior to basal.

Food-plants: *Populus* and *Salix*.

**8. Pteronus marlattii** Dyar.

1891. *Nematus marlattii* Dyar. Trans. Am. Ent. Soc., XXII, p. 305.

*Female.*—Length 5.5 mm.; moderately robust, shining; clypeus broad
and shallowly notched; ocellar basin deep and with well-defined wall
frontal crest unbroken; antennal fovea large, triangular, deeply exc
vated; antennæ slender, third and fourth joints subequal; venati
normal; stigma broad, ovate, widest at center, rounded on lower margi
sheath broad, obtusely pointed, upper margin slightly emarginat
claws deeply cleft, rays subequal. Color of head, thorax, epimera a
dorsum of abdomen for the most part, and outer half of poster
femora black; apices of posterior tibiæ and their tarsi dusky; fa
below antennæ, mouth parts, orbits, angles of pronotum narrowl
tegulæ, narrow apical margin of dorsal segments and last two segment
venter except epimera and some dusky spots on lateral margin
abdomen, and legs except as noted pallid, inclined to yellowish; ap
of sheath brownish; antennæ ferruginous beneath and toward ape
veins, including stigma and costa, the latter nearly to base, brown.

Characterized in manuscript by me from a specimen collected in Ne
Hampshire (Coll. Am. Ent. Soc.); first published by Dyar from
specimen bred from larva on alder (Dyar's Coll.).

**9. Pteronus atriceps** new species.

*Female.*—Length 6.5 mm.; moderately robust; clypeus very broadl
and shallowly emarginate, lobes minute; frontal crest strongly deve
oped, entire; lateral walls of ocellar basin not strongly raised; fov
elongate, deep; antennæ medium, with joints 3 and 4 subequal; thi
cubital cell not more than one-third as wide at base as at apex, abo
four times as long as wide at base; venation otherwise normal; stigm
broad, rounded on lower margin, tapering gradually from near base t
tip; sheath broad basally, tapering to an obtuse tip, upper margi
straight; claws not very deeply notched, inner ray nearly as long a
outer. Color black, shining; tips of clypeus, mouth parts, tegul
legs except coxæ, and venter of abdomen, including lateral edges
dorsal sclerites, yellow; upper posterior orbits and outer angles of pr
notum reddish; legs slightly infuscated, particularly the tarsi; sheat
dark brown; veins brown, stigma unicolorous, brown.

One female. Nevada. (Coll. Am. Ent. Soc.)

**10. Pteronus coloradensis** new species.

*Female.*—Length 6 mm.; rather elongate, surface shining; clypeus
deeply, circularly emarginate, lobes rounded; frontal crest and sides

pentagonal area distinctly raised, former unbroken; antennal fovea deep, triangular; antennæ slender, longer than head and thorax, third and fourth joints equal; intercostal vein its own length anterior to basal vein; upper cell of hind wings exceeding lower; stigma broad, rounded on lower margin; second transverse cubital one-third length of third, or third cubital cell strongly divaricating; sheath very narrow and obtusely pointed at tip, smooth, without or with very minute hairs; cerci short; claws deeply and almost evenly notched. Color of head except faint ferruginous touches about orbits, thorax, the first dorsal sclerite of abdomen, and bases of posterior coxæ black; following dorsal sclerites of abdomen with interrupted brown stripes on each; antennæ brownish, lighter beneath, especially toward tips; extreme tips posterior femora, apical two-thirds of their tibiæ and all their tarsi, tips of anterior pairs of tarsi, and narrow margin of sheath fuscous; clypeus and mouth parts light resinous; legs and abdomen, except as noted, light ferruginous; wing veins light brown, stigma and costa paler basally.

*Male.*—Length 6 mm.; slender, elongate; clypeus broadly emarginate, lobes short, pointed; walls about ocellar basin very minute, but distinctly defined; crest unbroken, not strongly raised; fovea very shallow, triangular; antennæ robust, strongly tapering, somewhat flattened, joints 3 to 5 subequal, third a little longer than others; venation normal; procidentia narrow, projecting somewhat more than its width, rounded at tip; claws rather deeply cleft, rays subequal. Color black, shining; mouth parts and legs, venter of abdomen, including more or less of apical edge of dorsal segments and nearly all of terminal segments, yellowish ferruginous; angles of pronotum widely, and tegulæ pallid; wings hyaline, veins brown, including stigma and costa; hind tibiæ and their tarsi brownish; posterior orbits very faintly reddish, strongly infuscated; antennæ reddish, especially beyond basal joints and on lower edge.

Three females and two males. Colorado and Montana. (Coll. Am. Ent. Soc.)

**11. Pteronus harringtoni** new species.

*Female.*—Length 7 mm.; robust, shining; clypeus broadly and not deeply notched; ocellar basin distinctly defined; crest strong, unbroken; fovea deep, with lateral channels running from it over bases of antennæ; antennæ short, tapering, joints 3 and 4 nearly equal; intercostal at right angles, or nearly so, with costa; second recurrent interstitial, stigma rounded on lower margin, somewhat acuminate at apex; cerci very short; claws deeply cleft, rays equal. Color black; angles of pronotum, tegulæ, legs for the most part, and venter of abdomen, together with marginal third of dorsum, reddish yellow; tip of clypeus and mouth parts yellowish, infuscated; extreme tips of posterior tibiæ

and posterior tarsi brownish black; wings with dusky band extendi
transversely below the stigma; stigma and veins dark brown.

*Male.*—Length 6 mm.; rather slender; characters of head and antenn
as in female; procidentia short, narrow, slightly constricted basally
truncate at apex; venation as in female. Color black; border of pr
notum and tegulæ yellowish; legs as in female; basal half of vente
of abdomen beneath reddish, strongly infuscated; dusky band o
wings somewhat lighter than in female.

One female and one male received from Mr. Harrington, who report
that this species has been somewhat abundant on willows on th
experimental farm at Ottawa, Canada. He was at first of the opinio
that it might prove to have been introduced from Europe, but it seem
to be distinct from any European species and also to be new to ou
fauna. I take pleasure, therefore, in dedicating it to Mr. Harrington
A male specimen has since been submitted to me for identification b
Rev. Thomas W. Fyles, of South Quebec, Canada. (Coll. U. S. Nat. Mus.

12. **Pteronus fylesi** new species.

1891. *Nematus pallidiventris* Fallen. Fyles, Can. Ent., XXIII, p. 135.

*Female.*—Length 7 mm.; robust, shining; clypeus circularly emargi
nate, lobes rounded; walls about ocellar basin well developed; frontal
crest unbroken; fovea oval; antennæ slender, tapering, longer than head
and thorax, third and fourth joints nearly equal; venation normal;
stigma broad, regularly tapering toward apex; sheath broad, tapering,
slightly produced, and with a rather dense tuft of short hairs at extreme
tip; cerci short; claws deeply and evenly cleft. Color black; triangle
beneath bases of antennæ, clypeus for the most part, labrum and other
mouth parts, pronotum, tegulæ, abdomen except broad dorsal stripe,
and legs for the most part reddish yellow; sheath, cerci, extreme tips
of posterior tibiæ, and the posterior tarsi dark brown; anterior tarsi
slightly infuscated; extreme bases of coxæ brown.

*Male.*—Length 6 mm.; slender; structural characters in general as
in female; antennæ somewhat stouter, slightly compressed; procidentia
short, narrow, truncate at apex. Color as in female, except that the
dorsum of abdomen is entirely black and the venter is slightly infus-
cated, especially toward apex.

Two females and one male received from Rev. Thomas W. Fyles, of
South Quebec, Canada. The species was described by Mr. Fyles in
the Canadian Entomologist, as noted above, the identification having
been made for him by the Abbé Provancher. I have compared the
species with specimens of *pallidiventris* Fallen, and there is a merely
superficial color resemblance; *pallidiventris* belongs to the genus *Pris-
tiphora*, and is a totally distinct insect. This species seems to be
distinct from any European species, and while allied somewhat closely

to *limbatus* Cresson and *harringtoni* n. sp., yet differs sufficiently, particularly in the male sex, to warrant the creation of a new species. It is possible that this is an introduced species, but if so it seems not to have been described abroad. It was found abundantly on Russian willow introduced into Canada by the late Charles Gibbs.

13. **Pteronus kincaidi** new species.

*Female.*—Length 6.5 mm.; rather robust; abdomen broad, scarcely tapering until near tip; clypeus distinctly emarginate, lobes broad and rounded; walls about ocellar basin nearly obsolete; frontal crest strongly developed, slightly broken by backward extension of elongate antennal fovea; antennæ short, scarcely tapering, joint 4 a little longer than 3; venation normal; stigma broad, rounded on lower margin; claws deeply and evenly cleft; sheath very broad, robust, scarcely tapering, rounded at apex; cerci short, tapering. Color black; space between antennæ and face beneath including narrow orbits, pronotum, tegulæ, venter of abdomen extending over onto the sides of dorsum, especially on the posterior margin of the segments, and the legs rather dark resin yellow; extreme bases of coxæ and the hind tarsi particularly, with extreme tips of hind tibiæ infuscated; sheath dark brown; wings hyaline; veins, including costa and stigma, dark brown.

*Male.*—Males agree with the females in general characteristics; procidentia short, narrow, and rounded apically, rather broad basally; hind tibiæ rather strongly infuscated, especially toward tip; dorsal arcs of abdomen entirely black; antennæ more elongate and somewhat more robust.

Nine females and five males collected in April and May by Trevor Kincaid, Olympia, Wash. (Coll. Cornell Univ.)

14. **Pteronus foveatus** new species.

*Female.*—Length 5.5 mm.; moderately robust, shining; clypeus broadly emarginate, lobes sharp pointed; ridges about ocellar basin strongly and sharply defined; frontal crest unbroken; antennal fovea large, circular, deeply and sharply excavated; antennæ a little longer than head and thorax, scarcely tapering, joints slender, 3 and 4 subequal; sheath narrow, tapering, upper edge straight, tip rounded, hairs minute; claws not very deeply cleft, rays equal; venation about normal; third cubital cell more than twice as wide at apex as at base; stigma narrow, elongate, subacuminate. Color of antennæ, large spot extending back from occiput including ocelli with branches running down in front of eyes, base of the head, thorax, bases of first six dorsal segments of abdomen except on outer edges, and the epimera except anterior upper angles of the mesepimera black; antennæ slightly rufous toward tip; sheath brownish; body otherwise yellowish ferruginous, including spot below antennæ, mouth parts, angles of pronotum, tegulæ, lateral edges and

posterior margin of dorsal segments, two terminal segments, ventr and legs; veins dark brown, including costa nearly to base; stigm yellowish, unicolorous, border brownish.

One female. Washington. (Coll. Am. Ent. Soc.)

**15. Pteronus bicolor** new species.

*Female.*—Length 5.5 to 6 mm.; robust; clypeus broadly emarginate lobes small, pointed; ocellar basin with rather faint lateral walls; front crest unbroken; antennal fovea broad, shallow; antennæ slender scarcely tapering, joints 3 and 4 subequal; venation normal; stigma broad, rounded on lower margin, rather abruptly narrowed toward tip sheath tapering to obtusely pointed tip, straight on upper side; claws evenly but not deeply divided. Color black above, pale beneath, the black limited to dorsal area of antennæ and all of the two basal joints, large spot including ocellar basin, ocelli, the occiput, thorax and abdomen above, spot on upper half of mesepimera and large spot on pectus, together with tip of sheath; face white; orbits and venter pallid, including also lateral edges of terminal abdominal segments above and all of last segment; wings hyaline; veins brown; stigma pale basally.

Two females, Mount Hood, Oreg. (Coll. Am. Ent. Soc.), and Olympia, Wash. (Coll. Cornell Univ.).

**16. Pteronus tricolor** new species.

*Female.*—Length 7 mm.; moderately robust, shining; clypeus broadly and shallowly emarginate, lobes triangular; frontal crest and sides of pentagonal area sharply defined, former unbroken; antennal fovea circular; intercostal vein more than its own length anterior to basal vein; third cubital cell not much more than one-half as wide at base as at apex; stigma moderately broad, rounded on lower margin; upper middle cell of hind wings exceeding lower; sheath smooth, polished, pointed, bordering hairs very minute. Color of head and thorax for most part, first dorsal segment of abdomen and lighter bands on two following segments (nearly wanting on third), apex of sheath, apical three-fourths of hind femora, hind tibiæ and tarsi (the former gradually paling toward bases), brownish black; the orbits and portions of the center of thorax, including scutellum, light yellowish brown; balance of abdomen ferruginous; clypeus and mouth parts, outer angles of pronotum, tegulæ, anterior legs and posterior pair, except as noted, yellowish white; anterior femora and tarsi very slightly tinged with reddish; stigma and veins, including costa, except extreme base of latter, brown.

One female. New Hampshire. (Coll. Am. Ent. Soc.)

**17. Pteronus rufocinctus** Harrington.

1893. *Nematus rufocinctus* Harrington. Can. Ent., xxv, p. 58.

*Female.*—Length 8 mm.; rather elongate, shining; clypeus very shallowly emarginate, approaching truncate; ocellar basin with very sharply

defined and strongly raised walls; frontal crest prominent, sharp, unbroken; fovea distinctly defined, oval; second, third, and fourth joints of antennæ subequal; venation normal, except that the third cubital cell is quadrate; sheath short, obtusely pointed, quite densely clothed with hairs; cerci slender, slightly tapering; claws deeply cleft, rays subequal. Color black; center of basal segment of abdomen above and all of three following segments and more or less of the base of the succeeding segment reddish yellow; tip of clypeus and mouth parts, anterior legs for the most part, coxæ except bases, trochanters, bases of femora, and basal half of tibiæ of hind legs pallid; angles of pronotum and the tegulæ pallid, infuscated; femora of fore and middle legs rather strongly infuscated; stigma and veins dark brown; wings nearly hyaline; spot in second cubital cell prominent.

Redescribed from Harrington's type specimen. (Coll. Harrington.)

18. **Pteronus erythrogaster** Norton.

1864. *Nematus erythrogaster* Norton. Proc. Ent. Soc. Phila., III, p. 8.
1867. *Nematus erythrogaster* Norton. Trans. Am. Ent. Soc., I, p. 205. (Cat., etc., p. 67.)
1886. *Nematus erythrogaster* Provancher. Add. faun. Can. Hym., p. 23.

*Female.*—Length 7.5 mm.; moderately robust, shining; head and thorax finely punctured; clypeus shallowly and broadly emarginate, lobes triangular, rather pointed; frontal crest and sides of pentagonal area strongly raised, former unbroken; antennal fovea circular, deeply excavated; antennæ moderate, somewhat longer than head and thorax; intercostal very near basal vein; second cubital cell more than two-thirds as wide at base as at apex; upper cell of hind wings exceeding lower; stigma broad, ovate, not attenuated; sheath rather robust, rugose and with numerous hairs. Color of head and thorax for the most part, basal plates, first segment of abdomen dorsally, sheath, cerci, extreme bases of hind coxæ, tips of hind femora, apical two-thirds of hind tibiæ, and all of hind tarsi black; extreme tips of clypeus and the labrum, palpi, outer angles pronotum, tegulæ, abdomen, and legs, except as noted, rufous; basal third of hind tibiæ whitish; veins and stigma in general brown; costa and some of posterior veins light.

Two females. Maryland (Coll. Am. Ent. Soc.), and Ithaca, N. Y., N. Banks, collector (Coll. U. S. Nat. Mus.).

19. **Pteronus corylus** Cresson.

1880. *Nematus corylus* Cresson. Trans. Am. Ent. Soc., VIII, p. 8.
1895. *Nematus corylus* Dyar. Trans. Am. Ent. Soc., XXII, p. 306.

*Female.*—Length 6 to 7 mm.; head and thorax rather coarsely punctured, somewhat shining; clypeus very shallowly emarginate, lobes very short and broadly rounded; frontal crest and sides of ocellar basin distinctly elevated, former unbroken, or rarely indistinctly so; antennal fovea broad and shallow, antennæ long, tapering, third joint longer than fourth; venation normal, second transverse cubital nearly as long

as third; stigma robust, rounded on lower margin; sheath not very robust, rounded at apex, and with rather long and dense hairs; cerci long, slender, as long as or longer than third cubital cross vein; claws deeply cleft, rays nearly equal. Color of head, thorax, base of first dorsal sclerite, sheath, extreme tips of posterior femora, apical half—sharply defined—of posterior tibiæ, and their tarsi black; sometimes the dorsal middle of segments 2 to 4 and rarely 6 and the cerci brownish black; bases of antennæ, tips of clypeus, and the labrum, palpi, outer angles of pronotum, tegulæ, legs, and abdomen yellowish ferruginous; posterior femora and abdomen darker; veins and stigma brown; costa yellowish.

Four females, Cresson's types, Pennsylvania (Coll. Am. Ent. Soc.), and seven females bred from larvæ on alder, Cadet, Mo., October 5, 1881 (Coll. U. S. Nat. Mus.). Adults emerged during latter part of March and early in April. The last larval stages and the cocoon are described by Mr. H. G. Dyar, who states that the larvæ are gregarious edge feeders on alder.

**20. Pteronus dyari** new species.

*Female.*—Length 6 mm.; very robust; clypeus nearly truncate; ocellar basin well defined, with prominent anterior angle; antennal fovea very shallow, indistinct; head and thorax coarsely punctured; antennæ but little shorter than the body, tapering, third joint longest; venation normal; stigma stout, regularly rounded on lower margin; sheath short, stout, scarcely projecting; claws deeply notched, rays subequal. Color black, shining; mouth parts strongly infuscated; angles of pronotum, tegulæ, first to fifth segments of abdomen ventrally and dorsally, yellowish ferruginous; coxæ except bases, trochanters, basal half of posterior tibiæ, whitish; anterior tibiæ and tarsi and anterior and posterior faces of anterior femora, together with bases of middle pair, pallid; wings nearly hyaline, or very slightly infuscated; veins, including stigma and costa to base, very dark brown.

*Male.*—Length 5.5 mm.; structurally as in female; procidentia long, projecting; antennæ more robust, tapering. Color as in female, except that the abdomen is wholly black and the legs are yellowish, except extreme tips of posterior femora and apical half of posterior tibiæ and their tarsi.

One female and one male. H. G. Dyar, collector, New York. (Coll. Dyar.)

**21. Pteronus fulvicrus** Provancher.

1882. *Nematus fulvicrus* Provancher. Nat. Can., XIII, p. 291.
1883. *Nematus fulvicrus* Provancher. Faun. Ent. Can. Hym., p. 740.
1890. *Nematus salicis* Ashmead. Bull. Colo. Biol. Assn., I, p. 15.
1894. *Nematus salicicola* Dalla Torre. Cat. Hym., I, p. 257.

*Female.*—Length 8.5 mm.; robust; clypeus broadly but not very deeply notched; walls about ocellar basin distinctly defined; crest

prominent, unbroken; fovea shallow; antennæ tapering, somewhat longer than head and thorax, joints 3 and 4 subequal; second recurrent vein interstitial with second transverse cubital; venation otherwise normal stigma moderately broad; claws deeply cleft, rays equal; sheath robust, obtusely pointed, straight on upper margin. Color black; labrum pallid; tips of anterior femora, all hind femora, and abdomen except apical segment orange yellow, inclined to reddish on legs; legs otherwise black or strongly infuscated; veins dark brown, including costa and stigma; wings slightly smoky, especially centrally.

Three females collected in Colorado: One (Ashmead's type) in Mr. Ashmead's collection; the others in collection of Cornell University. I have since obtained the original type of Provancher, through the kindness of Abbé V. A. Huard, and confirmed the synonymy as above. The type specimen now lacks the abdomen, and was labeled by Provancher *rufierus* (485), although published as *fulvicrus*. It was captured at St. Hyacinthe (Can.), and is in the Provancher collection.

22. **Pteronus populi** new species.

*Female.*—Length 7 mm.; clypeus broadly but not deeply notched, lobes broad, rounded; frontal crest very prominent, unbroken; sides of pentagonal area distinctly raised; antennal fovea broad, shallow, not distinctly defined; antennæ slender, slightly tapering, longer than head and thorax, third and fourth joints equal; intercostal vein a little in advance of basal, not inclined; first transverse cubital hyaline; upper middle cell of hind wings extending one-fifth its length beyond lower; second transverse cubital more than half as long as third; stigma not broad, rounded regularly on lower margin; sheath rather broad, excavated slightly above, pointed, and with rather dense whitish hairs at tip; cerci short; claws deeply cleft, rays nearly equal. Color of head and thorax for the most part, basal plates, base of first dorsal segment, terminal segment including sheath and cerci, extreme bases of coxæ, hind tibiæ, hind tarsi, and veins including costa brownish black; tip of clypeus, labrum, posterior orbits, outer angles of pronotum, tegulæ, spot on side of mesothorax, abdomen, and legs except as noted yellowish ferruginous; orbits, mesothorax, abdomen, and femora inclined to reddish; tibæ and tarsi of anterior legs very slightly infuscated.

One female from Massachusetts reared in May, 1888, by Mr. J. G. Jack, from larvæ found on *Populus tremuloides*. (Coll. U. S. Nat. Mus.)

23. **Pteronus hudsonii** Dyar.

1894. *Nematus hudsonii magnus* Dyar, Trans. Am. Ent. Soc., XXII, p. 306.

*Female.*—Length 10 mm.; rather robust, shining; clypeus very shallowly notched, almost truncate; fovea distinctly excavate, triangular; frontal crest very prominent, unbroken; ocellar basin distinctly defined;

antennal joints 3 and 4 subequal, or fourth a little longer than third; venation normal; stigma very broad, rounded on lower margin; sheath narrow, tapering; claws rather coarsely and evenly notched. Color of head, antennæ, anterior lobe of mesonotum, scutellum, metanotum, terminal segment of abdomen, sheath, and thorax ventrally black, shining; hind tibiæ, except basal third and their tarsi, dark brown; angles of pronotum, tegulæ, lateral lobes of mesonotum, abdomen, and legs except as otherwise noted yellowish ferruginous; clypeus and mouth parts except mandibles, pale; veins dark brown; wings hyaline, fore wings slightly infuscated below stigma.

One female, Dyar's type. (Coll. Dyar.)

This species was reared by Mr. Dyar from a larva collected on poplar.

24. **Pteronus auratus** new species.

*Female.*—Length 6.5 mm.; not very robust, shining; clypeus broadly, shallowly notched, lobes broad, rounded; frontal crest prominent, extending nearly to orbits, angulated; sides of ocellar basin very minutely raised; antennal fovea triangular, distinctly defined; antennæ long, slender, third and fourth joints subequal; venation normal, third cubital cell less than one-half as wide at base as at apex; stigma moderately broad, regularly rounded on lower margin; sheath narrow, obtusely pointed, bordering hairs very short, minute; cerci scarcely tapering; claws rather minutely cleft, rays subequal. Color as in *californicus*, except that the coxæ are entirely light and the bases of antennæ, spot beneath, angles of pronotum, and tegulæ are whitish.

One female. Washington. (Coll. Am. Ent. Soc.)

This species is closely allied to *californicus*, but differs from it in what appear to be good structural characters.

25. **Pteronus californicus** new species.

*Female.*—Length 6.5 mm.; robust, glistening; clypeus very broadly and shallowly notched, lobes rather pointed; frontal crest strongly developed, rectilinear, extending nearly to orbits, unbroken; sides of ocellar basin minutely but distinctly raised; antennal fovea deep, broad-oval; intercostal very oblique, anterior to basal; second recurrent nearly interstitial; second transverse cubital more than one-half as long as third; upper middle cell of hind wings exceeding lower; stigma robust; sheath narrow, obtusely pointed; cerci slender, tapering; rays of claws unequal. Color of head, thorax, basal plates, base of first dorsal sclerite, and bases of coxæ black; tip of sheath, posterior tarsi, and wing veins, including costa nearly to base, brown; stigma lighter; clypeus, bases of mandibles and labrum, yellowish white; outer angles of pronotum, tegulæ, palpi, legs and abdomen, including cerci, yellowish ferruginous; upper orbits with slightly reddish tinge.

One female. California. (Coll. Am. Ent. Soc.)

26. **Pteronus antennatus** new species.

*Female.*—Length 6 mm.; rather robust, shining; clypeus circularly but shallowly notched, lobes minute; ocellar basin distinctly defined, sides sharply raised; frontal crest broad, rounded, unbroken; antennal fovea deep, circular; antennæ very long, slender, almost as long as body, joints 3 and 4 subequal; third cubital cell nearly twice as wide at apex as at base; stigma very broad, regularly rounded beneath; sheath strongly tapering toward rounded apex, nearly straight on upper margin, with very short, inconspicuous pubescence; cerci short, spindle shaped; claws not deeply notched, rays subequal. Color of base of antennæ, more or less about ocelli, occiput, pronotum except outer angles, spot on anterior and lateral lobes of mesonotum, spot about cenchri, basal plates and base of first segment of abdomen, thorax beneath except centers of mesepimera, hind femora except bases, tips of hind tibiæ and their tarsi, brownish-black (one specimen has the thorax dorsally and the epimera altogether black); otherwise reddish ferruginous; coxæ, trochanters, bases of femora and anterior legs for the most part, and the mouth parts lighter yellowish; veins, including costa nearly to base, brown; stigma brown, paler basally; extreme apex of sheath brown.

Two females. New Hampshire. (Coll. Am. Ent. Soc.)
This species comes very near *tricolor*.

27. **Pteronus ribesii** Scopoli.

1763. *Tenthredo ribesii* Scopoli. Ent. Carn., p. 280.[1]
1866. *Nematus ribis* Walsh. Pract. Ent., I, p. 78.
1866. *Nematus ventricosus* Walsh. Pract. Ent., I, pp. 117–125.
1867. *Nematus ventricosus* Norton. Trans. Am. Ent. Soc., I, p. 208. (Cat., etc., p. 70.)
1867. *Nematus trimaculatus* Fitch. Trans. N. Y. Agr. Soc., XXVII, pp. 909–932.
1867. *Nematus trimaculatus* Fitch. 12th Rept. Ins. N. Y., pp. 909–932.
1867. *Nematus ventricosus* Walsh. Pract. Ent., II, pp. 67, 116.
1869. *Nematus ventricosus* Walsh and Riley. Am. Ent., II, pp. 12–22.
1869. *Nematus ventricosus* Saunders. Can. Ent., II, pp. 13–17.
1869. *Nematus ventricosus* Walsh. Can. Ent., II, pp. 9–12; 31–33.
1869. *Nematus ventricosus* Saunders. Can. Ent., II, pp. 47, 93, 112.
1869. *Nematus ventricosus* Bowles. Can. Ent., II, p. 115
1870. *Nematus ventricosus* Saunders. Can. Ent., II, pp. 146–149.
1870. *Nematus ventricosus* Packard. Packard's Guide, p. 219.
1870. *Nematus ventricosus* Glover. Ann. Rept. U. S. Dept. Agr., p. 77.
1871. *Nematus ventricosus* Bowles. Can. Ent., III, p. 7.
1871. *Nematus ventricosus* Saunders. Can. Ent., III, pp. 25–27.
1871. *Nematus ventricosus* Jones. Can. Ent., III, p. 37.
1872. *Nematus ventricosus* Packard. 3d Mem. Peabody Acad., pp. 1–17.
1874. *Nematus ventricosus* Riley. 6th Rept. Ins. Mo., pp. 43, 149.

[1] The above bibliography omits all European literature except the first description and the last generic reference, and also many of the shorter or less important American writings.

1874. *Nematus ventricosus* Provancher. Nat. Can., VI, pp. 186–192.
1874. *Nematus ventricosus* Cook. 4th Ann. Rept. St. Pom. Soc. Mich., pp. 379–380.
1874. *Nematus ventricosus* Saunders. Can. Ent., VI, pp. 101–104.
1877. *Nematus ventricosus* Riley. 9th Rept. Ins. Mo., pp. 7, 10, 21–22.
1877. *Nematus ventricosus* Packard. 9th Rept. U. S. Geol. and Geog. Surv., 1875, p. 787.
1878. *Nematus ventricosus* Provancher. Nat. Can., X, p. 56.
1879. *Nematus ventricosus* Riley. N. Y. Tribune, June 11, 1879.
1880. *Nematus ventricosus* Fuller. Am. Ent., III, p. 92.
1880. *Nematus ribesii* Fletcher. Entom. Mag., XVI, p. 278.
1880. *Nematus ventricosus* Thomas. 5th Rept. (10) Ins. Ill., p. 68.
1881. *Nematus ventricosus* Coquillett. 11th Rept. Ins. Ill., pp. 5, 46–48.
1882. *Nematus ventricosus* Saunders. Can. Ent., XIV, p. 147.
1883. *Nematus ventricosus* Lintner. Proc. Am. Assn., XXXI, pp. 471–472.
1883. *Nematus ventricosus* Lintner. Psyche, IV, pp. 48–51.
1883. *Nematus ventricosus* Lintner. Can. Ent., XV, p. 200.
1883. *Nematus ventricosus* Provancher. Petite Faune Ent. Can., II, p. 188.
1883. *Nematus ventricosus* Fyles. Can. Ent., XV, p. 205.
1883. *Nematus ventricosus* Riley. Stoddart's Encyclo. Amer., I, pp. 135–142.
1883. *Nematus ventricosus* Saunders. Ins. Inj. to Fruits, pp. 339–342, 360.
1885. *Nematus ventricosus* Lintner. 2d Rept. Ins. N. Y., pp. 217–221.
1886. *Nematus ventricosus* Lintner. N. E. Homestead, XX, p. 189.
1886. *Nematus ventricosus* Forbes. Entom. Amer., II, p. 173.
1887. *Nematus ventricosus* Lintner. Popular Gardening, II, p. 120.
1887. *Nematus ventricosus* Lintner. Albany Express, XLI, p. 2.
1888. *Nematus ribesii* Fernald. Mass. Hatch Exp. Sta. Bull., 2, p. 7.
1888. *Nematus ventricosus* Lintner. 5th Rept. Ins. N. Y., pp. 156–157.
1888. *Nematus ventricosus* Harvey. Ann. Rept. Maine Exp. Sta., pp. 182–184.
1888. *Nematus ventricosus* Weed. 7th Ann. Rept. Ohio Agr. Exp. Sta., p. 152.
1889. *Nematus ribesii* Fletcher. Can. Ent., XXI, p. 150.
1889. *Nematus ventricosus* Weed. Bull. Ohio Exp. Sta., II, No. 1, p. 6.
1889. *Nematus ventricosus* Hull. Ins. Life, I, p. 319.
1889. *Nematus ventricosus* Beckwith. Bull. IV, Del. Agr. Exp. Sta., p. 15.
1889. *Nematus ventricosus* Riley and Howard. Ins. Life, I, p. 229.
1889. *Nematus ventricosus* Hulst. Bull. XLVI, N. J. Exp. Sta., p. 8.
1890. *Pteronus ribesii* Konow. Deutsch. Ent. Zeit., XXXIV, p. 246.
1890. *Nematus ventricosus* Hopkins. Ann. Rept. W. Va. Exp. Sta., p. 153.
1891. *Nematus ribesii* Cook. Rept. Mich. Exp. Sta. 1890–91.
1891. *Nematus ribesii* Fletcher. Bull. 11, Can. Cent. Farm (May).
1892. *Nematus ventricosus* Garman. Bull. 40, Ky. Agr. Exp. Sta. (March).

*Female.*—Length 7 to 7.5 mm.; very robust, short-bodied species; head rugose, punctured, thorax less so; clypeus very broadly and shallowly emarginate, sometimes almost truncate, lobes short and not very broad; frontal crest and sides of ocellar basin not well defined, former entire or indistinctly broken; antennal fovea rather deep at apex, oval; antennæ slender, slightly tapering, third joint longest; intercostal vein considerably anterior to basal, usually at right angles to costa; second recurrent frequently interstitial; third cubital cell usually not longer than outer transverse vein; upper middle cell of hind wings frequently not reaching apex of lower or outer veins interstitial, rarely upper cell exceeding lower cell; stigma moderately robust, rounded on lower margin; sheath rather narrow, rounded at extremity, hairs short; cerci very slender and long, not tapering; claws with rays nearly equal.

Color of head above clypeus except triangle below antennæ, orbits, more or less of antennæ above, center of lobes of mesonotum more or less of scutellum, lower half of mesepimera, metepisterna, extreme tips of posterior tibiæ, posterior tarsi, and tip of sheath brownish black; balance of body and legs luteous; mouth parts, coxæ, and trochanters pallid.

*Male.*—Length 6 mm.; body short, robust, in general as in female; clypeus scarcely emarginate, slightly produced at center, giving trilobed appearance; antennæ more robust than in female, joints 3 to 5 subequal; procidentia very broad, as broad as long, constricted at base; hypopygium very much narrowed toward apex, which is obtusely rounded. Color of head above clypeus, thorax, including all of epimera, basal plates, more or less of central dorsal area of abdomen, and extreme bases of posterior coxæ brownish black; antennæ, tips of posterior tibiæ and their tarsi, veins, and stigma brownish; antennæ lighter beneath; mouth parts, pronotum tegulæ, base of costa, legs, abdomen beneath, and more or less of lateral dorsal region luteous; orbits, lateral lobes, mesonotum, and basal edges of scutellum more or less tinged with rufous.

Twelve females and five males, from Canada to Missouri. (Colls. U. S. Nat. Mus. and Am. Ent. Soc.)

28. **Pteronus edwardsii** Cresson.

1880. *Nematus edwardsii* Cresson. Trans. Am. Ent. Soc., VIII, p. 7.

*Female.*—Length 5.5 mm.; robust, shining; clypeus very slightly emarginate, almost truncate, lobes very broad; frontal crest and sides of ocellar basin indistinctly elevated, vertex nearly smooth; antennal fovea broad, triangular, shallow; antennæ tapering, almost as long as the entire body, joint 4 slightly longer than 3; intercostal vein posterior to basal, very little inclined; upper middle cell of hind wings very little exceeding lower; stigma elongate, acuminate; sheath very broad, short, obtusely pointed; cerci rather robust, tapering. Color of head and thorax except basal plates, posterior tarsi and tips of posterior tibiæ, sheath, and cerci brownish black, tinged with rufous—the latter color occurring on the pronotum, tegulæ, lateral margin of lobes of mesonotum, sides of scutellum, and upper half of mesepimera; spot below antennæ, clypeus, labrum, palpi, legs, and abdomen, including basal plates, yellowish ferruginous; antennæ unicolorous, black; wing veins, including stigma and costa, brownish.

One female, Cresson's type. Marin County, Cal. (Coll. Am. Ent. Soc.)

29. **Pteronus militaris** Cresson.

1880. *Nematus militaris* Cresson. Trans. Am. Ent. Soc., VIII, p. 7.
1886. *Nematus militaris* Provancher. Add. Faun. Can. Hym., p. 23.

*Female.*—Length 7 mm.; exp. al. 14 mm.; moderately robust, shining; clypeus deeply notched, lobes narrow; frontal crest prominent, some-

times slightly broken; antennal fovea shallow, indistinct; mouth parts with rather long yellowish hairs; antennæ very slender, slightly tapering, as long as abdomen, fourth joint a little longer than third; intercostal nerve frequently interstitial with basal, nearly at right angles with costa; upper cell of hind wings exceeding lower; third cubital cell scarcely at all divaricating apically; stigma not very robust, tapering apically; sheath obtusely pointed, straight on upper edge, narrow; cerci as long as terminal joint of antennæ, slender; head and thorax, particularly on lower side, with short, sericeous pile; claws rather minutely cleft, inner ray shortest. Color of head except palpi and sometimes lobes of clypeus, anterior margin of pronotum, band along center of mesonotum, metanotum, metepisterna, basal plates, abdomen above, including sheath and cerci, and tips of posterior tibiæ and their tarsi black; fore tarsi dusky; balance of thorax, venter of abdomen, and legs pale, ferruginous; the venter of abdomen more or less obscure with fuscous, sometimes very dark, approaching black; veins and stigma, including costa to base, dark brown.

Two females from New Hampshire (Coll. Am. Ent. Soc.) and one each from Illinois and Washington (Coll. U. S. Nat. Mus.).

30. **Pteronus thoracicus** Harrington.

1893. *Nematus thoracicus* Harrington. Can. Ent., xxv, p. 58.
1895. *Nematus thoracicus* Dyar. Trans. Am. Ent. Soc., xxii, p. 307.

*Female.*—Length 6 mm.; robust; clypeus deeply notched, lobes narrow; walls of ocellar basin rounded, crest unbroken; antennal fovea shallow, circular; venation about normal; stigma broad, rounded on lower margin; sheath rather short and robust, regularly rounded at tip; claws evenly but not deeply notched. Color reddish yellow; antennæ, head except tip of clypeus and more or less of mouth parts, apical half (sometimes all) of scutellum, metanotum, center of basal dorsal arcs of abdomen, and sheath black; tips of hind tibiæ and the hind tarsi usually infuscated; veins, including stigma, brown; wings hyaline.

*Male.*—Length 4.5 mm.; structurally in the main as in female; procidentia apparently nearly wanting. Color black; pronotum, tegulæ, legs, and upper half of mesepimera and venter of abdomen yellowish ferruginous; hind tarsi infuscated.

Redescribed from the type specimen of female loaned by Mr. Harrington and two bred specimens (male and female) received from H. G. Dyar, who reports the larvæ (which he also describes) to feed singly on the lower surface of the leaves of *Amelanchier canadensis*.

I have also examined five specimens, two from Washington and three from Mount Hood, Oreg. (Coll. Am. Ent. Soc.). In some specimens the tergum is strongly infuscated and with more or less black on lobes of mesothorax.

31. **Pteronus odoratus** Dyar.

1894. *Nematus salicis odoratus* Dyar. Can. Ent., XXVI, p. 187.

*Female.*—Length 5.5 mm.; short, robust, shining; head nearly spherical viewed laterally; clypeus rather narrowly and deeply emarginate; ocellar basin distinctly defined, sides acute, finely raised; frontal crest broad, somewhat broken at middle; antennal fovea broad, circular, shallow; antennæ longer than head and thorax, not very robust, tapering, joints 3 and 4 subequal; venation normal; stigma broadest at base, tapering regularly and acuminately to apex; sheath narrow, rounded at apex; cerci very short, robust; claws not deeply notched, rays subequal. Color of antennæ, spot on vertex including ocelli extending back over occiput, mesonotum, metanotum, abdomen dorsally except narrow lateral margin and apex, and apex of sheath black; scutellum basally and sutures of mesothorax inclined to reddish; posterior tibiæ and their tarsi slightly infuscated; antennæ inclined to ferruginous toward tip, especially beneath; entire venter and otherwise except as noted pallid; veins and stigma except extreme base of costa dark brown.

*Male.*—Length 5 mm.; moderately robust, shining; clypeus projecting, notch a complete semicircle, lobes long, rounded; ocellar basin distinctly defined; frontal crest not, or very slightly, notched; antennal fovea large, circular, deeply excavated; antennæ very robust, flattened, tapering, joints 3 and 4 subequal; venation normal, except that the third cubital cell is nearly quadrangular; stigma elongate, regularly rounded on lower margin; procidentia short, narrow, rounded at apex; hypopygium flexed so as to appear strongly notched at apex; claws minutely notched, rays subequal. Color of antennæ, head above, frontal crest extending over occiput, mesonotum, metanotum, and abdomen except narrow lateral margin black; face, mouth parts, orbits, lateral dorsal margin of abdomen above, and entire venter light yellowish; posterior tibiæ, particularly at apex, and their tarsi strongly infuscated; flagellum rufous beneath; veins, including stigma and costa, the latter to base, dark brown.

This well-marked species seems to be the one characterized by Dyar (l. c.), who also describes the eggs and larval stages. The eggs and larvæ were found at Woods Hole, Mass., on willow.

Seven females, one collected in August in Maine (Coll. Am. Ent. Soc.), three from Michigan, and three from Ithaca, N. Y. (Coll. Cornell Univ.). The male is characterized from a specimen (Coll. Am. Ent. Soc.) without locality label, evidently one of Walsh's judging from the pinning, and probably collected in Illinois.

32. **Pteronus cornelli** new species.

*Female.*—Length 7 mm.; moderately robust, shining; clypeus broadly, circularly emarginate, lobes rounded, not broad; ocellar basin deeply

and distinctly excavated; lateral walls rounded; frontal crest strongly developed, divided by narrow depressed line at middle; antennal fovea deep; antennæ slender, strongly tapering, joints 4 and 5 subequal; venation normal; sheath narrow, tapering to rounded tip; claws deeply and evenly notched. Color of antennæ, large spot including ocelli and extending over vertex, dorsum of thorax, and abdomen black; posterior tibiæ darker at tips, with tarsi brown; sheath brown; veins brown, stigma scarcely paler; face, orbits, pronotum, tegulæ, entire venter, with lateral edges of dorsum of abdomen, pallid or resinous.

*Male.*—Length 5 mm.; slender; antennæ not much stouter than in female; procidentia short, narrow, projecting about its own width. Color as in female, except that the antennæ are fulvous beneath and the pectus is strongly infuscated.

Eleven females and five males (Coll. Cornell Univ.), labeled "Lot 85, sub. 965," dated May to July, 1890.

### 33. **Pteronus trilineatus** Norton.

1867. *Nematus trilineatus* Norton. Trans. Am. Ent. Soc., I, p. 215. (Cat., etc., p. 77.)
1872. *Nematus trilineatus* Norton. Trans. Am. Ent. Soc., IV, p. 79.
1877. *Nematus trilineatus* Glover. Rept. U. S. Dept. Agric., p. 92.
1880. *Nematus similaris* Norton. Rept. Ent. U. S. Dept. Agric. 1879, p. 224, Pl III, fig 1.
1881. *Nematus trilineatus* Thomas. 10th Rept. Ent. Ill., 1880, p. 68.
1885. *Nematus robiniæ* Forbes. 14th Rept. State Ent. Ill., 1884, p. 116, Pl. 12, fig. 5.
1886. *Nematus similaris* Harrington. Can. Ent., XVIII, p. 39.
1886. *Nematus similaris* Provancher. Add. Faun. Can. Hym., p. 24.
1890. *Nematus similaris* Packard. Rept. U. S. Ent. Comm., V, p. 369, fig. 136.
1890. *Nematus robiniæ* Packard. Rept. U. S. Ent. Comm., V, p. 370.
1895. *Nematus similaris* Dyar. Trans. Am. Ent. Soc., XXII, p. 301 (larva).

*Female.*—Length 6.5 to 7 mm.; moderately robust, shining; clypeus broadly, circularly, but deeply emarginate, lobes large, triangular; frontal crest and sides of ocellar basin distinctly defined, former unbroken, curving anteriorly; antennal fovea triangular, sharply defined; antennæ long, slender, tapering, third and fourth joints equal or latter longest; venation normal; intercostal vein slightly inclined; third cubital nearly three times as long as wide at base; stigma moderately robust, widest at center; sheath narrow, smooth, tapering on both edges to rounded tip; cerci slender, not tapering; rays of claws nearly equal. Color reddish yellow; antennæ, spot on head surrounding ocelli and extending over occiput, anterior and lateral lobes of mesonotum, small spot beneath anterior wings, metanotum (except metascutellum, sutures, and lateral margin), abdomen (except lateral margin of segments and last segment), apical half of sheath, and posterior tibiæ and tarsi brownish black; antennæ fulvous beneath toward tips; tips of anterior tarsi dusky; veins, including costa to base and stigma, brown, latter darker basally.

Twelve females from Canada, Massachusetts, New York, Kansas,

South Carolina, and Montana (Colls. Am. Ent. Soc. and U. S. Nat. Mus.), and eight bred specimens, including Norton's type specimen of *similaris* (Coll. U. S. Nat. Mus.). Forbes's *N. robiniæ*, the type of which I have examined, is undoubtedly a light-colored specimen of this species. It differs in lacking the black on the anterior lobe of the mesonotum and the small spot beneath the anterior wings.

34. **Pteronus magus** new species.

*Female.*—Length 8 mm.; very robust, stout, shining; clypeus very broadly and shallowly notched, lobes small, pointed; ocellar basin distinctly defined, sides faintly raised; crest stout; fovea elongate, rather deeply excavated; antennæ longer than head and thorax, slender, tapering, joints 3, 4, and 5 subequal, fourth slightly longest; venation normal; stigma regularly rounded on lower margin; sheath broad, obtusely pointed, densely hairy at apex and on lower margin; claws large, deeply cleft, rays subequal. Color of spot on head including ocelli extending rather narrowly over vertex, large spot on anterior lobes of mesonotum, spot on apex of scutellum, metanotum, and abdomen dorsally for the most part black; head except as noted, pronotum, entire venter, the lateral edge of abdomen dorsally, more or less of posterior margin of some of the middle segments, yellowish ferruginous; antennæ black basally; flagellum reddish, more or less infuscated, especially at base above; sheath brown; veins brown, stigma and costa lighter, yellowish brown.

One female. Canada. (Coll. Am. Ent. Soc.)

35. **Pteronus quercus** new species.

*Female.*—Length 4.5 mm.; very robust, shining; clypeus nearly truncate, vertex smooth; ocellar basin indistinctly defined, sides rounded; frontal crest broad, unbroken; fovea defined only on anterior margin; antennæ not much longer than head and thorax, slender, scarcely tapering, third joint longest; intercostal interstitial, nearly at right angles to costa; venation otherwise normal; stigma very broad, ovate; apex of costa greatly thickened, half as broad as stigma; sheath robust, densely clothed with long, whitish hairs at apex and on lower margin; cerci short; claws large, deeply cleft. Color of spot on vertex including ocelli extending back over occiput, mesonotum, metanotum, and abdomen except narrow lateral margin black dorsally; antennæ brownish, inclined to ferruginous beneath; body otherwise pallid; legs, mesepimera, border of spot on vertex, slightly inclined to reddish; veins yellowish brown; stigma and costa yellowish.

One female, bred from larva found in June on oak at Ithaca, N. Y., by Mr. Trelease. Adult emerged March 22. (Coll. U. S. Nat. Mus.)

This insect may fall in the genus *Pontania*.

36. **Pteronus hyalinus** new species.

*Female.*—Length 7 mm.; rather robust, shining; clypeus very broadly, but not deeply emarginate; ocellar basin with distinctly defined walls;

crest prominent, unbroken; fovea deeply excavated but not distinctly limited; antennæ very slender, tapering, joint 4 a little longer than 3; venation normal, except that the intercostal vein is nearly interstitial with basal; sheath narrow, tapering to rounded tip; claws coarsely but not very deeply notched, rays subequal. Color of antennæ, large spot including ocelli extending over vertex, mesonotum, metanotum, and abdomen dorsally black; orbits, face beneath frontal crest, pronotum, tegulæ, lateral area of thorax, abdomen above, venter and legs altogether yellowish or pallid; pectus brown; tips of posterior tibiæ, tarsi and extreme edge of sheath brownish; stigma and costa hyaline; veins otherwise brown.

One female, reared by Mr. H. G. Dyar from a solitary larva taken feeding on edge of leaf of white birch. The larva was described by Mr. Dyar under the name of *Nematus lateralis* Norton. (Trans. Am. Ent. Soc., XXII, 1895, p. 307.)

37. **Pteronus vertebratus** Say.

1836. *Nematus vertebratus* Say. Bost. Journ. Nat. Hist., I, p. 218.
1859. *Nematus vertebratus* Leconte, Say, Ent., II, p. 678.
1861. *Nematus vertebratus* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 158.
1867. *Nematus vertebratus* Norton. Trans. Am, Ent. Soc., I, p, 215. (Cat., etc., p. 77.)
1880. *Nematus dorsivittatus* Cresson. Trans. Am. Ent. Soc., VIII, p. 10.
1895. *Nematus dorsivittatus* Dyar. Trans. Am. Ent. Soc., XX.I, p. 303.

*Female.*—Length 6 mm.; rather robust, shining; clypeus distinctly but not very broadly emarginate, lobes rounded; sides of ocellar basin distinctly, rather sharply raised; frontal crest rounded, broken at middle; antennal fovea circular, shallow; antennæ very long, slender, considerably longer than head and thorax; joints 3 to 5 subequal; venation normal; stigma moderate, circular on lower margin; sheath rather pointed, lower margin regularly rounded, upper straight or slightly concave, bordering hairs very minute; cerci slender, scarcely tapering; claws not very deeply notched, rays subequal. Color light yellowish; antennæ, spot on vertex including ocelli extending back over occiput, lobes of mesonotum except lateral edges, metanotum, and tergum centrally except apex of last sclerite black or dark brown; antennæ lighter beneath; upper margins of hind tibiæ and their tarsi more or less infuscated; extreme tip of sheath brownish; veins brownish, including costa nearly to base; stigma unicolorous, pale.

*Male.*—Length 4 mm.; slender, shining; antennæ as long as the body of the insect; structurally in general as the female; antennal joints decreasing uniformly in length from third to tip; fovea somewhat triangular, extending laterally over base of antennæ; procidentia narrow, nearly twice as long as wide, slightly notched at tip. Color of antennæ basally above, spot including ocelli and extending over occiput, mesonotum, metanotum, and dorsum of abdomen black; face below frontal crest, orbits, pronotum, tegulæ and entire venter, yellowish; antennæ

fulvous beneath and toward tip, somewhat infuscated above; posterior tibiæ and tarsi infuscated; wings hyaline; stigma and costa pale.

Two females. Nevada and California. (Coll. Am. Ent. Soc.)

What is possibly the male of this species is described from specimens received from Mr. H. G. Dyar, labeled "S. F. 311." Cresson's *dorsivittatus* can not be distinguished from this species from the description, and seems synonymous with it. The type of *vertebratus* is lost. According to Mr. H. G. Dyar, who describes the egg and the larval stages from specimens collected at Plattsburg, N. Y., this species is a solitary edge feeder on poplar.

38. **Pteronus integer** Say.

1836. *Nematus integer* Say. Bost. Journ. Nat. Hist., I, p. 218.
1859. *Nematus integer* Leconte. Say Ent., II, p. 679.
1861. *Nematus integer* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 158.
1867. *Nematus integer* Norton. Trans. Am. Ent. Soc., I, p. 216. (Cat., etc., p. 78.)
1883. *Nematus integer* Packard. Rept. U. S. Ent., pp. 149–150.
1890. *Nematus integer* Packard. Rept. U. S. Ent. Comm., V, pp. 838–840.

*Female.*—Length 6 to 6.5 mm.; robust, shining; clypeus circularly emarginate, lobes small, rounded; ocellar basin distinctly limited; frontal crest large, slightly broken at middle; antennal fovea expanding basally; antennæ very long, slender, distinctly tapering; stigma not very broad; venation normal; cerci robust, tapering; sheath rather narrow, slightly concave above, rounded at apex; claws not very deeply notched, inner ray distinctly shorter than outer. Color of spot on head, including ocelli and extending to bases of antennæ, center of anterior lobes of mesonotum, metanotum, and central portion of abdomen dorsally brownish black; antennæ dark brown, reddish beneath and apically; tibiæ and tarsi slightly infuscated; sheath narrowly tipped with brown; body otherwise pallid; veins, including costa, light yellowish brown; stigma yellowish hyaline.

Two females. Colorado and New Jersey. (Coll. Am. Ent. Soc.)

39. **Pteronus mendicus** Walsh.

1866. *Nematus mendicus* Walsh. Proc. Ent. Soc. Phila., VI, p. 261.
1867. *Nematus trivittatus* Norton. Trans. Am. Ent. Soc., I, p. 218. (Cat., etc., p. 80.)
1867. *Nematus mendicus* Norton. Trans. Am. Ent. Soc., I, p. 220. (Cat., etc., p. 82.)
1878. *Nematus mendicus* Provancher. Nat. Can. X, p. 58.
1883. *Nematus mendicus* Provancher. Faun. Ent. Can. Hym., p. 191.
1895. *Nematus mendicus* Dyar. Trans. Am. Ent. Soc., XXII, p. 302.

*Female.*—Length 5 to 6 mm.; not very robust, shining; clypeus broadly but not deeply notched, lobes rounded; ocellar basin with distinctly defined but rounded lateral walls; frontal crest prominent, broken at middle, or strongly bituberculate; antennal fovea broad, shallow; antennæ longer than head and thorax, very slender, tapering,

joints 3 and 4 subequal; venation normal; stigma broad, regularly rounded on lower margin; sheath tapering, straight or slightly concave on upper margin; cerci short, robust; claws deeply cleft, rays unequal. Color very light yellowish; very narrow border of ocelli, small spot on occiput, sometimes line on anterior lobe of mesonotum, spot on lateral lobes of mesonotum (sometimes subobsolete), apex of scutellum, spot between cenchri, brownish black; posterior tibiæ and tarsi very slightly infuscated; antennæ brown ferruginous, the latter color predominating toward tip; sheath sometimes tipped with brown; veins light yellowish brown; costa and stigma greenish hyaline.

*Male.*—Length 4.5 to 5 mm.; slender, shining; structural characters in general of female; procidentia narrow, projecting, squarely truncate at apex, about as wide as long. Color of antennæ above and basally, large spot on vertex including ocelli and extending over occiput and covering entire base of head, mesonotum, metanotum, and abdomen except lateral margins of segments black; upper orbits, venter, abdomen, and legs for the most part yellowish ferruginous; lower orbits and face below frontal crest and mouth parts pallid; tibiæ and tarsi, particularly posterior pair, infuscated; lower surface of flagellum rufous; veins brown; costa and stigma somewhat lighter, yellowish brown.

Nine females, Illinois, Pennsylvania, and New York (Coll. Am. Ent. Soc.), and from Missouri, Kansas, and Iowa (Coll. U. S. Nat. Mus.).

Three males. Massachusetts and California. (Coll. Am. Ent. Soc.)

For a discussion of the habits of this species, which Mr. Walsh erroneously supposed to be inquilinous in the galls of other Nematines, see Proc. Ent. Soc. Wash., III, p. 267. Mr. H. G. Dyar has described the early stages from material collected on willow in New York City and at Plattsburg, N. Y.

**40. Pteronus vancouverensis** new species.

*Female.*—Length 6.5 to 7 mm.; not very robust, shining; clypeus broadly emarginate, lobes broad; antennal basin with sharply raised defining walls; crest prominent, bilobed or bituberculate; fovea not distinctly defined; antennæ slender, elongate, fourth joint a little longer than third; venation normal; sheath narrow, tapering, pointed; claws very minutely but evenly cleft. Color pallid, inclined to resinous; antennæ black above, yellowish beneath; anterior lobes of mesonotum brownish, infuscated centrally; tip of scutellum with spot on either side and spots on center of metanotum black; costa and stigma hyaline, veins otherwise dark brown; extremities of legs very slightly infuscated, together with extreme tip of sheath.

*Male.*—Length 6 mm.; slender, shining; procidentia projecting considerably more than its width, narrow, squarely truncate at tip; claws minutely and evenly cleft. Color of antennæ above, large spot including ocelli and extending over vertex and occiput, lobes of mesonotum except scutellum and metanotum, most of basal abdominal segment

above, together with transverse stripe on each of succeeding segments, dark brown or black; mouth parts, orbits, and area about base of antennæ, pronotum, tegulæ, scutellum, venter with most of lateral dorsal area of abdomen and sutures of segments, and legs yellowish resinous; face paler; hind tibiæ and tarsi slightly infuscated; antennæ yellowish beneath.

Four females. Vancouver Island, Alameda and Placer County, Cal., and Nevada. (Colls. U. S. Nat. Mus. and Am. Ent. Soc.)

One male. Alameda, Cal., Mr. Koebele, collector. (Coll. U. S. Nat. Mus.)

41. **Pteronus koebelei** new species.

*Female.*—Length 5 mm.; robust, shining; clypeus deeply emarginate, lobes broad, rounded; ocellar basin sharply defined; crest unbroken at middle, straight; antennal fovea very broad, extending laterally from base of antennæ; venation normal, except that the sides of the third cubital cell are parallel; stigma broad, regularly rounded on lower margin; sheath regularly tapering on upper and lower margins to rounded apex, hairs very minute except at extreme apex, where a small tuft of longer hairs occurs; cerci long, slender, slightly tapering; claws deeply notched, rays nearly equal. Color light greenish yellow, with purple tinge on head and thorax; spot including ocelli, more or less of base of head, spot on anterior extremity of the middle lobe of mesonotum extending backward in a narrow line, spot on lateral lobes of mesonotum, one on either side of scutellum, two just within the cenchri, and small spots on basal plates black; antennæ black, sometimes ferruginous beneath; legs, especially tarsi, with distinct greenish cast; veins brown, stigma and costa greenish yellow.

Five females. California and Oregon. (Coll. U. S. Nat. Mus.)

42. **Pteronus pinguidorsum** Dyar.

1895. *Nematus pinguidorsum* Dyar. Trans. Am. Ent. Soc., XXII, p. 303.

*Female.*—Length 8 mm.; robust, shining; clypeus deeply, circularly emarginate, lobes broad, circular, rounded at tip; ocellar, basin distinctly defined, lateral walls not very sharply raised, crest unbroken, fovea deep, extending laterally over bases of antennæ; antennæ slender, tapering, joints 3 and 4 subequal; venation normal; stigma narrow, sides almost parallel, rather abruptly truncate at tip; sheath robust, obliquely truncate at tip; claws strong, deeply notched. Color light yellow, inclined to pallid; small spot connecting ocelli, antennæ above, and anterior edge of cenchri dark brown or black; anterior lobes of mesonotum brownish purple, head above tinged with purple; antennæ beneath yellowish; posterior tibiæ toward tips and all tarsi very slightly infuscated; extreme tip of sheath brown; stigma yellow; veins dark brown; wings hyaline.

One female, Dyar's type. Mr. H. G. Dyar characterizes the last larval stages from solitary larvæ found on the edges of the leaves of white birch at Keene Valley, N. Y.

43. **Pteronus unicolor** new species.

*Female.*—Length 6 mm.; moderately robust, shining; clypeus broadly and shallowly emarginate, lobes small, rather pointed; ocellar basin distinctly defined; frontal crest narrow, unbroken; antennal fovea broad, rounded, subtriangular, deeply excavated; venation normal; stigma elongate, acuminate; sheath tapering on lower margin to rather pointed apex, superior margin straight or but slightly convex; claws deeply notched, rays equal. Color uniformly yellowish ferruginous, the latter color most noticeable on vertex, dorsum of thorax and abdomen and the tips of hind femora, all the tibiæ and tarsi; veins brown, except extreme base of stigma, which is white; costa somewhat paler than other veins, especially at base.

One female. California. (Coll. Am. Ent. Soc.)

44. **Pteronus longicornis** new species.

*Male.*—Length 6 to 7 mm.; not very robust, shining; clypeus shallowly and broadly emarginate; sides of ocellar basin and frontal area rounded, indistinct; antennal fovea shallow, indistinct; antennæ very long, slightly tapering, nearly as long as body, joints nodose at tips, lower ones flattened, joints 3 to 5 subequal; procidentia very broad, one-third as wide as last segment, rounded at tip, strongly constricted basally; claws deeply notched, rays subequal; intercostal vein nearly at right angles to costa and its own length anterior to basal vein; third cubital cell nearly twice as wide at apex as at base and three to four times as long as wide at base; venation otherwise normal; stigma rather broad, ovate, rounded beneath, with slight angle near center. Color black; clypeus, mouth parts, angles of pronotum, tegulæ, narrow lateral margin of abdomen with posterior margin of the central segments and the two terminal segments, venter of abdomen, and legs yellowish ferruginous; tips of the posterior tibiæ and their tarsi, black; veins, including stigma and costa, the latter nearly to base, dark brown.

Many specimens. Michigan, New York, and Long Island (Coll. U. S. Nat. Mus.), and Massachusetts and Canada (Coll. Am. Ent. Soc.)

45. **Pteronus iridescens** Cresson.

1880. *Nematus iridescens* Cresson. Trans. Am. Ent. Soc., VIII, p. 5.

*Male.*—Length 5 to 6 mm.; not very robust, shining; clypeus circularly and rather deeply emarginate; ocellar basin large, lateral walls and frontal crest distinctly defined, the latter unbroken; antennal fovea very shallow, indistinct, elongate; antennæ robust, flattened, short, not much longer than head and thorax, tapering, joints 3 and 4

subequal; procidentia narrow, truncate, not projecting; claws not very deeply notched, rays subequal; intercostal vein at right angles to costa; third cubital cell elongate, scarcely divaricating; stigma not very broad, rounded on lower margin; venation otherwise normal. Color black; clypeus, labrum, palpi, extreme angles of pronotum, tegulæ, apices of coxæ, tips of femora, including nearly all of anterior pairs, anterior tibiæ, and tarsi more or less light yellowish; posterior tibiæ and tarsi infuscated, anterior tarsi indistinctly so; veins dark brown, including costa nearly to base; stigma brown, unicolorous.

Two males, Cresson's type specimens, from Nevada and one from southern California. (Coll. Am. Ent. Soc.)

46. **Pteronus decoratus** Provancher.

1888. *Nematus decoratus* Provancher. Add. Faun. Can. Hym., p. 369.

*Male.*—Length 5.5 mm.; rather robust, shining; clypeus very broadly, rather shallowly emarginate, lobes small, rounded; ridges about ocellar basin indistinct and rounded; vertex smooth, glistening; antennal fovea scarcely present; antennæ rather stout, tapering, not longer than head and thorax, joints 3 to 5 subequal; procidentia minute, scarcely projecting; venation normal; stigma not very broad; apex of costa greatly enlarged, almost as large as stigma; claws deeply cleft, inner ray parallel with outer. Color black, shining; orbits, face below antennæ, pronotum, tegulæ, and legs for the most part pallid; femora except line on under side, apices of hind tibiæ together with lower edges of same, and the hind tarsi brown; hind coxæ brown, except at tip; wings nearly hyaline, veins yellowish brown, stigma and costa somewhat paler.

Redescribed from Provancher's type specimen, kindly loaned me by Abbé Huard. The specimen was collected in Florida by Mr. Ashmead. It is distinct from any other known species of the genus and represents the extreme southern range of this group of sawflies. In characters of the vertex it is not typical of the genus to which it is assigned, although in characters of claw and otherwise it seems to be a *Pteronus*.

47. **Pteronus lombardæ** new species.

*Male.*—Length 5.5 mm.; rather slender, shining; clypeus shallowly but distinctly emarginate; vertex smooth, glistening; ridges about ocellar basin rounded but distinct; venation normal; intercostal very slightly inclined; stigma moderately broad, rounded on lower margin; procidentia narrow, short, blunt; claws rather minutely notched, rays subequal. Color black; clypeus, labrum, palpi, tegulæ, and legs from trochanters outward except posterior tibiæ and tarsi yellowish ferruginous; posterior tibiæ, except bases, and their tarsi strongly infuscated; veins and stigma dark brown; wings very faintly infuscated, almost hyaline.

Three males, one from Lansing, Mich., labeled "Lombardy poplar," and two specimens bred from larvæ on willow by Mr. Dyar (Coll. U. S. Nat. Mus.).

Mr. Dyar, for whom I determined as above some bred males, thinks this may prove a seasonal form of *ventralis* (Trans. Am. Ent. Soc., XXII, 1895, p. 305). Mr. Dyar's specimens were obtained in New York on *Salix*, and, together with the types, present what seem to be good specific differences from *ventralis*.

48. **Pteronus dubius** new species.

*Male.*—Length 5.5 mm.; clypeus broadly emarginate, almost truncate; frontal crest very large, strongly angled anteriorly, lateral walls of basin tapering rapidly posteriorly; antennal fovea narrow, breaking slightly through crest; antennæ robust, flattened, joints 4 and 5 a little longer than 3; venation about normal; second recurrent interstitial or nearly so in fore wings and the outer veins of discal cells interstitial in hind wings; stigma rather narrow, rounded on lower margin; procidentia short, not very broad, apex rounded; claws deeply divided, rays subequal. Color black, shining; clypeus and other mouth parts and extending to eyes whitish; narrow line on venter of abdomen, including all of hypopygium and the legs, ferruginous yellow; bases of coxæ black; wings hyaline; veins and stigma brown.

One male. Wellesley, Mass., March 29. (Coll. U. S. Nat. Mus.)

49. **Pteronus stigmatus** Norton.

1861. *Nematus stigmatus* (Harris) Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 161.
1867. *Nematus stigmatus* Norton. Trans. Am. Ent. Soc., I, p. 221. (Cat., etc., p. 83.)

*Female.*—Color greenish luteous; body short and stout; antennæ moderate, the two basal joints black; a small black spot about each of ocelli; clypeus hardly emarginate; labrum angulate, hairy; part of mesothorax, the metathorax, the first seven segments of tergum and ovipositor sheaths, and a spot on pleura below wings black; legs pale; tips of tarsi and claws blackish; wings hyaline; stigma and costa pale green.

One female. Massachusetts. (Harris's Coll.)
It has the size and form of *N. monochroma*.

50. **Pteronus monochroma** Norton.

1861. *Nematus monochroma* (Harris) Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 161.
1867. *Nematus monochroma* Norton. Trans. Am. Ent. Soc., I, p. 221. (Cat., etc., p. 83.)

*Female.*—Color honey yellow; body stout; antennæ wanting, except two basal joints, which are color of body; ocelli black, set in an irregular depression; clypeus retracted, crenate; labrum angulate; face immaculate; tegulæ, collar, venter, and coxæ paler than rest of body; pleura dark, almost piceus; legs color of body; wings hyaline; stigma and costa pale yellow.

One female. Massachusetts. (Harris's Coll.)
Resembles *N. luteus*, of Europe.

The last two species, Nos. 49 and 50, I have been unable to recognize in the material examined. The type specimens are lost, and I quote without alteration Norton's original descriptions.

## IX. Genus AMAURONEMATUS Konow.

*Amauronematus* Konow. Deutsche Entom. Zeits., XXXIV, 1890, p. 237.

Body large; clypeus emarginate at apex; claws bifid; antennæ short, subsetaceous, usually black; stigma elongate, ovate at base, elongate-acuminate toward apex; head, mesonotum, and mesopleura finely and closely punctured and more or less opaque; head subtriangular; labium long, protruding; sheath of female thick, usually large.

This genus, characterized as above by Konow, includes a group of distinctly differentiated and closely allied species, the American representatives of which may be separated by the aid of the following table:

TABLE OF SPECIES.

Inner tooth of claw small and comparatively inconspicuous ..... 1. *luteipes* Cr. ♀
Inner tooth or ray of claw large and nearly parallel with outer.
Body black dorsally; wings smoky.
Legs altogether black.
Venter of abdomen black; clypeus nearly truncate at apex.
2. *concolor* Nort. ♂
Venter of abdomen pale; clypeus distinctly emarginate.
3. *comstocki* n. sp. ♀
Tibiæ yellowish.
Clypeus and labrum pale; walls of ocellar basin distinctly defined.
4. *gracilis* n. sp.
Clypeus and labrum black; walls of ocellar basin somewhat indistinct.
5. *rapax* Cr. ♂
Body black dorsally; wings hyaline.
Abdomen black ventrally.
Legs, except apical half of hind tibiæ, red ..... 6. *rufipes* n. sp. ♂
Legs black except at joints ..... 7. *cooki* n. sp. ♂
Legs with tips of the femora and the tibiæ and tarsi pale.
Pronotum and tegulæ black; clypeus circularly emarginate.
8. *borealis* Marlatt. ♂
Pronotum and tegulæ pale margined; clypeus nearly truncate.
9. *nigrofemoratus* Cr. ♂
Pronotum broadly margined and tegulæ altogether pale; clypeus deeply emarginate, lobes triangular ..... 10. *orbitalis* n. sp. ♀
Abdomen pale ventrally ..... 11. *oregonensis* n. sp. ♀
Head and thorax usually more or less marked with black.
Abdomen black dorsally.
Stigma broadest at base; lobes of clypeus broad, rounded.
12. *fulvipes* Nort. ♂
Stigma widest at middle; lobes of clypeus small, triangular.
13. *pectoralis* Cr. ♂
Abdomen yellow; wings smoky; legs black ..... 14. *luteotergum* Nort. ♀
Abdomen yellow; wings clear or nearly so; legs pale.
Antennæ moderately robust, strongly tapering; sheath elongate, narrow, scarcely tapering, tip rounded.

Crest broken; mesonotum with three black stripes. 15. *discolor* Cr.
Crest slightly or not at all broken; mesonotum pale or with a single narrow stripe ..... 16. *lineatus* Harr.
Antennæ moderately robust, strongly tapering; sheath strongly tapering toward tip, latter obtusely pointed.
Anterior lobes, mesonotum, and tip of scutel black.
Stigma and costa dark brown ..... 17. *chalceus* n. sp.
Stigma and costa yellow ..... 18. *coquilletti* n. sp.
Anterior lobes, etc., pale ..... 19. *brunneus* Nort
Antennæ moderately robust, strongly tapering; sheath as above, but sharply produced at tip; clypeus deeply emarginate.
20. *excavatus* n. sp.
Antennæ long and slender, setaceous ..... 21. *californicus* n. sp.

INDEX TO SPECIES OF AMAURONEMATUS.



### 1. Amauronematus luteipes Cresson.

1880. *Nematus luteipes* Cresson. Trans. Am. Ent. Soc., VIII, p. 6.

*Female.*—Length 6.5 mm.; exp. al. 14 mm.; very robust, shining; finely pubescent; clypeus deeply and circularly emarginate, lobes narrow, rounded; frontal crest and sides of ocellar basin indistinct or wanting; antennal fovea very shallow, almost wanting; antennæ short, not much longer than head and thorax, rather slender, scarcely tapering, joints 3, 4, and 5 subequal; intercostal vein nearly interstitial with basal; third cubital cell scarcely longer on upper margin than wide at base; discal cells of hind wings with outer veins interstitial or nearly so; sheath narrow, obliquely truncate at apex; inner ray of claw minute, tooth like, and very near apex. Color brownish black; clypeus, labrum, bases of mandibles, orbits, particularly posteriorly, angles of pronotum, tegulæ and legs except bases of coxæ, more or less of apical margin of segments of abdomen, particularly ventrally, yellowish fulvous; sheath and cerci fulvous; veins, including stigma and costa, brown; wings slightly infuscated.

One female. Nevada. (Coll. Am. Ent. Soc.)

In the structure of the claw, this species diverges somewhat from the genus to which it is now assigned and approaches the structure occurring in *Pachynematus*. In general characters, however, it falls under *Amauronematus*.

2. **Amauronematus concolor** Norton.

1867. *Nematus concolor* Norton. Trans. Am. Ent. Soc., 1, p. 196. (Cat., etc., p. 58.)
1867. *Nematus violaceipennis* Norton. Trans. Am. Ent. Soc., 1, p. 201. (Cat., etc., p. 63.)
1886. *Nematus concolor* Provancher. Add. Faun. Can. Hym., p. 22.

*Male.*—Length 6.5 to 7 mm.; exp. al. 15 to 16 mm.; slender species; clypeus very slightly emarginate, almost truncate; crest and sides of ocellar basin nearly obsolete, indistinct; antennal fovea small, very elongate; antennæ longer than head and thorax, rather robust, flattened, fourth joint longer than third; intercostal its own length anterior to basal, strongly inclined; third cubital more than twice as long as wide at base; venation otherwise normal; procidentia very minute and squarely truncate or broadly excavated at apex; hypopygium broad and squarely truncate at apex, or slightly emarginate. Color black, with hairy pubescence on sides of thorax; clypeus, labrum, cheeks, and bases of mandibles whitish; upper and outer orbits faintly tinged with rufous; wings infuscated; veins, including costa and stigma, brown.

Two males. Maine and Michigan. (Colls. Am. Ent. Soc. and U. S. Nat. Mus.)

A single male collected in Massachusetts agrees exactly with the above in all structural characters, and differs only in that the abdomen is lighter, inclining to reddish, strongly infuscated, especially on the tip and base. This is Norton's *Nematus violaceipennis*, which undoubtedly belongs to *concolor*. I have seen a specimen also from Natick, Mass., collected April 19. (Coll. Cornell Univ.)

3. **Amauronematus comstocki** new species.

*Female.*—Length 9 mm.; rather elongate, slender; clypeus very shallowly emarginate; walls of ocellar basin rounded, indistinct, frontal crest almost wanting; antennal fovea shallow, elongate; antennæ short, joints 3 to 5 subequal, fourth longest; wing venation normal, stigma slightly angulated near middle; sheath obliquely truncate at tip. Color dull black; oral region, together with outer orbits and triangle at base of antennæ, most of pronotum, and venter of abdomen yellowish white; labium and palpi dark brown, pronotum marked with one or more circular brown spots; apical ventral segments more or less brown; sheath black; legs uniformly black, including joints; wings strongly infuscated; veins black.

One female. Ithaca, N. Y., May 2. (Coll. Cornell Univ.)

This species is very closely allied to *gracilis* in general appearance, but seems to be distinct by the structural characters of the vertex as well as colorationally. *A. concolor* Norton, of which males only are known, approaches this species very closely, and breeding records may eventually show the two species to be identical.

4. **Amauronematus gracilis** new species.

*Female.*—Length 8 mm.; elongate, slender; clypeus rather broadly and shallowly emarginate, lobes triangular; walls of ocellar basin distinctly defined; crest narrow, not extending laterally, slightly broken by deeply excavated, elongate antennal fovea; fourth joint of antennæ longer than third; upper discal cell of hind wings very elongate and considerably exceeding lower; sheath somewhat elongate, rounded at apex; cerci very long and filiform. Color dull brownish black; triangle between bases of antennæ, orbits and oral region, angles of pronotum, more or less of apical ventral segments, joints of legs, including most of the anterior tibiæ, yellowish; stigma and wing veins dark brown; wings slightly infuscated; labium and palpi brown.

Two females. Ithaca, N. Y., May 8, and Natick, Mass., April 19. (Coll. Cornell Univ.)

5. **Amauronematus rapax** Cresson.

1880. *Nematus rapax* Cresson. Trans. Am. Ent. Soc., VIII, p. 4.

*Male.*—Length 7 mm.; exp. al. 17 mm.; clypeus circularly but not deeply emarginate; frontal crest and sides of ocellar basin subobsolete; antennal fovea broad, shallow, not sharply limited, and extending indistinctly into ocellar basin; antennæ robust, flattened, not longer than head and thorax, joints 3 to 5 subequal, fourth and fifth slightly longer than third; venation normal; stigma broadest near base, tapering uniformly to attenuated apex; procidentia small, strongly keeled, truncate; hypopygium narrow at tip, slightly emarginate; outer ray of claw distinctly longer than inner. Color black, with hoary pubescence, particularly on thorax and legs; tips of femora, tibiæ, and two anterior pairs of tarsi, fulvous; outer orbits tinged with rufous; wings distinctly but not strongly infuscated.

One male. Nevada. (Coll. Am. Ent. Soc.)

6. **Amauronematus rufipes** new species.

*Male.*—Length 9 mm.; very slender, elongate; clypeus very broadly emarginate; ocellar basin distinctly defined but not deeply excavated; frontal crest not strongly developed, fovea triangular; antennæ very long and slender, fourth joint longest, nearly a third longer than third joint; first cubital cross vein wanting; stigma very elongate, narrow, acuminate; upper cell of lower wings exceeding lower by one-third its length; procidentia short, more than twice as broad as long, truncate; claws coarsely notched. Color black, shining; basal joint of maxillary palpi, all of legs except apical half of posterior tibiæ, reddish; tarsi inclined to yellowish, more or less infuscated, particularly posterior pair; wings hyaline; veins dark brown; costa, including tegulæ, somewhat paler.

One male. Indiana. (Coll. Cornell Univ.)

7. **Amauronematus cooki** new species.

*Male.*—Length 5 mm.; clypeus moderately and rather narrowly emarginate, lobes small, rounded; frontal crest not extending at all laterally, slightly broken by the shallow antennal fovea; sides of pentagonal area rounded, indistinct; furrows running from occiput to base of antennæ wide and deep; antennæ longer than head and thorax, joints 4 and 5 subequal, longer than 3; venation normal; procidentia short, squarely truncate with sharp angles, keeled; claws deeply notched. Color black; clypeus, oral region and beneath eyes whitish; joints of legs, with more or less of anterior face of tibia and apices of femora, yellowish; wings hyaline; stigma and veins, including costa nearly to base, dark brown; extreme angles of pronotum sordid yellowish.

One male. Michigan. (Coll. U. S. Nat. Mus.)

8. **Amauronematus borealis** Marlatt.

1892. *Nematus borealis* Marlatt. Proc. Acad. Nat. Sci. Phila., 1892, p. 133.

*Male.*—Length 6 mm.; exp. al. 14 mm.; head and thorax coarsely punctured, body generally more or less shining, particularly the abdomen; clypeus circularly but not deeply emarginate; frontal crest and sides of ocellar basin indistinct; antennal fovea elongate; antennæ rather stout, flattened, joints 4 and 5 with downward curve, fourth joint longest; third submarginal cell very narrow at base, not much more than one-third as wide as at apex; venation otherwise normal; stigma widest and slightly angulated one-third from base, tapering regularly to acuminate apex; procidentia narrow, short, constricted at base, truncate at apex; hypopygium narrow, rounded at tip; claws deeply cleft, rays subequal. Color black; labrum, tip of abdomen, tips of femora, the tibiæ and tarsi, except terminal joints of latter, yellowish or resinous; wings perfectly hyaline; veins dark brown, including costa to base; stigma luteous, with narrow brown border.

One male. Disco Island. (Coll. Am. Ent. Soc.)

9. **Amauronematus nigrofemoratus** Cresson.

1880. *Nematus nigrofemoratus* Cresson. Trans. Am. Ent. Soc., VIII, p. 4.

*Female.*—Length 6.5 mm.; exp. al. 16 mm.; very robust; clypeus very slightly emarginate, almost truncate; frontal crest and sides of ocellar basin indistinct; antennal fovea shallow, not distinctly defined, elongate; antennæ short, hardly as long as head and thorax, third to fifth joints subequal; intercostal cross vein very near basal, strongly inclined; venation otherwise normal; stigma broadest at base; sheath rather large, rounded on both sides toward the obtuse tip, which bears a dense scopa; cerci slender, medium, scarcely tapering. Color in general black; entire body, particularly the thorax, with a fine sericeus pile; upper and outer orbits, edge of angles of pronotum, border of tegulæ, spot below eyes, tip of clypeus and the labrum, trochanters, tips of

coxæ, tips of femora, tibiæ except extreme tips, yellowish; tips of tibiæ, especially posterior pair, tarsi, and palpi infuscated; wings hyaline; veins, including stigma and costa, brown.

One female. Nevada. (Coll. Am. Ent. Soc.)

10. **Amauronematus orbitalis** new species.

*Female.*—Length 7 mm.; exp. al. 15 mm.; rather slender; head and thorax finely punctured but more or less shining; abdomen more so; pubescence very minute; clypeus circularly, broadly, and rather deeply emarginate, lobes triangular, sharply pointed; frontal crest slightly broken; side walls of ocellar basin not very distinct; antennal fovea very minute, circular; antennæ very short, not nearly so long as head and thorax, third to fifth joints subequal; intercostal cross vein not half its length anterior to basal; third cubital cell not twice as long as wide at base, nearly quadrate; outer veins of discal cells of hind wings interstitial, or nearly so; venation otherwise normal; stigma narrow, tapering; sheath large, upper edge straight; cerci very long, slender, scarcely tapering. Color black; upper and outer orbits very broadly, inner orbits narrowly, beneath base of antennæ, clypeus, cheeks, outer angles of pronotum, tegulæ, apices of coxæ, trochanters, inner and outer faces of femora, tibiæ, tarsi, apex of abdomen beneath, yellowish fulvous; face inclined to pallid; tips of tarsi, particularly posterior pair, fuscous; sheath and cerci dark brown, almost black; veins brown, except basal two-thirds of costa; stigma brown, somewhat lighter centrally, especially at base.

Two females. Oregon and Colorado (Gillette). (Coll. U. S. Nat. Mus.)

11. **Amauronematus oregonensis** new species.

*Female.*—Length 7 mm.; exp. al. 15 mm.; head and thorax finely punctured; abdomen shining; clypeus very slightly, circularly emarginate; frontal crest large and broken; ocellar basin not very distinctly defined; antennal fovea distinct, circular; antennæ very slender, scarcely tapering, fourth joint longest; venation normal; stigma narrow, acuminate; sheath narrow, rounded; cerci slender, long, not tapering; claws deeply cleft, rays subequal. Color black; triangle beneath antennæ, orbits broadly except narrowly on inner side, cheeks, clypeus, labrum, bases of mandibles, palpi, angles of pronotum, tegulæ, abdomen beneath, apical margin of penultimate and all of the last dorsal segment, coxæ except at base, trochanters and legs whitish, the face being pallid and semitransparent; legs inclined to fuscous on upper and lower margins, and the tarsi strongly infuscated; sheath and cerci black, the venter more or less spotted with brown; wings hyaline; veins including costa except at extreme base, brown; stigma transparent along the center.

Two females. Mount Hood, Oreg. (Coll. Am. Ent. Soc.)

A specimen from Mr. Dyar differs from the above only in the darker-colored wing veins.

12. **Amauronematus fulvipes** Norton.

1861. *Nematus fulvipes* (Harris) Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 160.
1867. *Nematus fulvipes* Norton. Trans. Am. Ent. Soc., I, p. 212. (Cat., etc., p. 71.)
1882. *Nematus semirufus* Kirby. List Hym. Brit. Mus., I, p. 148.

*Female.*—Length 6 mm.; exp. al. 14 mm.; a short, robust species; clypeus shallowly, rather broadly emarginate, lobes short, broad; frontal crest short, strongly raised, and scarcely broken; sides of ocellar basin indistinct or wanting; antennal fovea small, shallow, circular; antennæ medium, third, fourth, and fifth joints subequal; intercostal cross vein very little anterior to basal, and oblique; venation normal; stigma broad near base, tapering regularly to apex; sheath very broad, obliquely truncate, upper angle obtusely pointed; cerci minute, very slender. Spot including ocelli and extending to base of antennæ, center of lobes of mesonotum, apical half of scutellum, metanotum, the abdomen dorsally, sheath, lower half of mesepimera, black; frontal crest, head below antennæ, orbits, pronotum, legs, and venter of abdomen pallid luteous; sutures of mesonotum, upper half of mesepimera, luteous, inclining to reddish; veins yellowish brown; stigma somewhat lighter, particularly at base; tarsi and posterior tibiæ, labium, and palpi very slightly infuscated.

One female. Maine. (Coll. Am. Ent. Soc.)

13. **Amauronematus pectoralis** Cresson.

1880. *Nematus pectoralis* Cressm. Trans. Am. Ent. Soc. VIII, p. 9.

*Female.*—Length 6.5 mm.; exp. al. 15 mm.; clypeus broadly emarginate, lobes small, triangular; frontal crest large, not distinctly defined, unbroken; antennal fovea minute, circular, shallow; antennæ short, slender, tapering, fourth joint slightly longer than third; intercostal anterior to basal vein; third cubital cell three times as long as wide at base; venation otherwise normal; stigma not very robust, widest at middle, lower margin circular; sheath moderately robust, obtusely pointed; claws large, rays subequal. Spot on head inclosing ocelli, with branches running to base of antennæ, antennæ, spot on anterior lobe and small spot on lateral lobes of mesonotum, apex of scutellum with spot on following sclerite, metanotum, dorsum of abdomen except terminal segment and narrow lateral margin, sheath, lower half of mesepimera except pectoral spot, upper and lower edges and bases of femora, and extreme bases of coxæ piceus; prothorax beneath, labium, and palpi fuscous; tibiæ and tarsi somewhat infuscated; head and thorax except as noted, abdomen beneath, and legs yellowish ferruginous, inclined to reddish on head and sutures of thorax and mesepimera; veins light yellowish brown; stigma and costa somewhat lighter.

In some specimens the mesepimera are entirely reddish or only slightly infuscated on their lower portion; also part of the face and base of wings are inclined to whitish.

Four females. Colorado and Nevada. (Coll. Am. Ent. Soc.)
This species scarcely differs from *A. fulvipes* Norton.

14. **Amauronematus luteotergum** Norton.

1861. *Nematus luteotergum* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 161.
1867. *Nematus luteotergum* Norton. Trans. Am. Ent. Soc., I, p. 206. (Cat., etc., p. 68.)
1882. *Nematus luteotergum* Provancher. Nat. Can., XII, p. 291.
1883. *Nematus luteotergum* Provancher. Faun. Ent. Can. Hym., II, p. 740.
1895. *Nematus luteotergum* Dyar. Trans. Am. Ent. Soc., XXII, p. 304.

*Female.*—Length 8.5 mm.; exp. al. 19 mm.; very robust; head and thorax opaque, abdomen shining, the former covered with a very minute hairy pubescence; clypeus somewhat broadly emarginate, lobes small, rounded; frontal crest and sides of ocellar basin indistinct; antennal fovea elongate, shallow; antennæ as long as head and thorax, fourth joint longer than third; intercostal cross nerve its own length anterior to basal nerve, strongly inclined; second transverse cubital but half as long as third; venation otherwise normal; stigma very narrow, elongate, and acuminate; sheath elongate, obtusely rounded at apex; cerci very long, scarcely tapering; claws deeply notched, the rays almost equal. Color of head and thorax for the most part, usually the dorsal center of basal plates with lateral spot and terminal dorsal segment of abdomen, sheath, legs, cerci, labium, and palpi black; front face of two anterior pairs of femora and tibiæ, paler; terminal joints of antennæ rarely, spot beneath base of antennæ, clypeus, labrum, bases of mandibles, more or less of upper and outer orbits, angles of pronotum, spot on lateral half of basal plates, and abdomen except as noted yellowish ferruginous; veins and stigma, including costa and tegulæ, dark brown; anterior wings particularly infuscated, and with a minute dot near the center of the second cubital cell, also one near the apex of the median cell.

Three females. Massachusetts. (Coll. Am. Ent. Soc.) I have also compared five specimens (females), representing Wellesley and Natick, Mass., and Ithaca, N. Y. (Coll. Cornell Univ.) Mr. H. G. Dyar describes the larvæ of this species from specimens taken on alder, Keene Valley, N. Y.

15. **Amauronematus discolor** Cresson.

1880. *Nematus discolor* Cresson. Trans. Am. Ent. Soc., VIII, p. 8.

*Female.*—Length 8.5 mm.; exp. al. 18 mm.; large, elongate, moderately robust species; the clypeus rather deeply emarginate, lobes large, rounded; frontal crest strongly elevated; sides of ocellar basin somewhat indistinct; fovea very elongate, shallow, and cutting through the

crest; antennæ short, not longer than head and thorax, slender, tapering, joints 4 and 5 subequal, longer than 3; intercostal cross nerve very oblique, nearly interstitial with basal nerve; second cubital cross vein about half as long as the third; venation otherwise normal; stigma very slender, elongate, and acuminate; sheath narrow, elongate, rounded at apex; cerci very slender, longer than last dorsal segment; claws deeply cleft, rays subequal. Color in general luteous; large spot on head including ocelli, antennal region except spot above clypeus, antennæ, center of anterior lobes of mesonotum, apex of scutellum, metanotum, narrow margin of basal plates, prothorax beneath, spot on outer angles of same, bases of coxæ and trochanters, ventral half of mesepimera, extreme tip of sheath, and the cerci piceus; upper and lower edges of femora and upper edges of tibiæ and tarsi, particularly the posterior pair, fuscous; veins, including stigma, costa, and tegulæ, yellowish brown; a minute dot occurs at the apex of the median cell and near the center of the second cubital cell; anterior wings, particularly, slightly infuscated.

Three females. Colorado. (Coll. Am. Ent. Soc.)

A female collected on willow blossoms at Olympia, Wash. (Coll. Cornell Univ.), differs from the above in being in general lighter colored, the dark markings being generally present but somewhat more restricted. The wing veins and particularly the stigma are lighter, and the mesepimera lack the pectoral dark spot.

16. **Amauronematus lineatus** Harrington.

1893. *Nematus lineatus* Harrington. Can. Ent., xxv, p. 59.

*Female.*—Length 7.5 mm.; robust, abdomen tapering from near base quite strongly toward apex; clypeus distinctly emarginate, lobes triangular; lateral walls of ocellar basin indistinct; frontal crest large, sharply defined, slightly or not at all broken; fovea triangular; antennæ not so long as head and thorax, tapering, joints 3 to 5 subequal; venation normal; stigma elongate, widest at base, tapering regularly to apex; sheath long, narrow, regularly and equally rounded on both margins to obtuse apex; cerci rather long, slender, scarcely tapering; claws large, deeply cleft, rays subequal. Color yellowish ferruginous; vertex and mesonotum inclined to reddish or with a purplish tinge; antennæ except on scape beneath, narrow line sometimes wanting on anterior lobe of mesonotum, apex of mesoscutellum, metanotum for most part, and the dorsal abdominal segments centrally, narrowing posteriorly, black; extreme upper and outer margin of sheath brown; extreme tips of posterior tibiæ and their tarsi very slightly infuscated; veins light yellowish brown; stigma and costa somewhat lighter yellowish.

Redescribed from the type of this species loaned by Mr. Harrington, and two specimens—one collected in Maine (Coll. Am. Ent. Soc.)

and the other in New York (Coll. U. S. Nat. Mus.). In the former the abdomen is very narrowly black centrally, and only on three or four basal segments. A female (Coll. U. S. Nat. Mus.) taken June 26, at Garland, Colo., is also provisionally placed with this species. It agrees in coloration with the Maine specimen, and also in structure, except that the sheath of the ovipositor is broadened basally.

17. **Amauronematus chalceus** new species.

*Female.*—Length 10 mm.; large, rather robust; clypeus deeply and broadly emarginate, lobes large, rounded; ocellar basin distinctly defined; frontal crest prominent, not or but slightly broken, extending in an indistinct ridge to the orbits; antennal fovea large, triangular, rather deeply excavated; antennæ distinctly tapering, third and fourth joints very much longer than fifth, third longest; third submarginal cell elongate, sides parallel; upper discal cell of hind wings considerably exceeding lower; sheath broad, tapering, slightly constricted before apex, with distinct scopa at tip; cerci short, slightly constricted at base; claws deeply and evenly notched. Color reddish yellow or resinous; antennæ with circle about base extending downward to clypeus, anterior and lateral lobes of mesonotum, apex of scutellum, metascutum, more or less of center of basal plates, prothorax beneath, and lower half of mesepimera brownish black; ocellar region, posterior tarsi, and tip of sheath more or less infuscated; wings slightly infuscated, especially between stigma and posterior border; veins and stigma dark brown, almost black.

Two females. Olympia, Wash. T. Kincaid, collector. (Coll. Cornell Univ.)

18. **Amauronematus coquilletti** new species.

*Female.*—Length 8 mm.; robust; clypeus broadly, rather deeply notched, lobes large, rounded; ocellar basin distinctly defined, lateral walls not strongly raised; frontal crest slightly broken by the backward extension of the deep and sharply defined oval antennal fovea; antennæ stout, longer than head and thorax, slightly tapering, densely clothed with short hairs; second recurrent nearly interstitial with second cubital; stigma broad, rounded on lower margin, acuminate; sheath narrow, tapering, slightly but obtusely produced at tip; claws coarsely and evenly notched. Color resinous yellow, inclined to reddish; antennæ, small spot including ocelli with branches running down toward bases of antennæ, stripe on each of anterior lobes of mesonotum, metanotum for the most part, ventral sclerites of prothorax, and lateral sclerites of metathorax black or dark brown; extreme tip of sheath brownish; wings hyaline or slightly smoky from rather dense pubescence; veins uniformly light yellowish brown; stigma and costa somewhat paler.

One female. Los Angeles, Cal. Mr. D. W. Coquillett, collector. (Coll. U. S. Nat. Mus.)

19. **Amauronematus brunneus** Norton.

1864. *Nematus brunneus* Norton. Proc. Ent. Soc. Phila., III, p. 8.
1867. *Nematus brunneus* Norton. Trans. Am. Ent. Soc., I, p. 205. (Cat., etc., p. 67.)

*Female.*—Length 7 mm.; exp. al. 16 mm.; robust; head and thorax finely punctured, opaque; clypeus sometimes almost truncate, or very slightly emarginate; sides of ocellar basin and frontal crest present but rounded, latter slightly broken; antennal fovea elongate; antennæ not longer than head and thorax, scarcely tapering, slender, joints 3 to 5 subequal; stigma not very broad, elongate, subacuminate; sheath tapering on both edges, somewhat angularly, to an obtuse tip, smooth, margined with very short scattering hairs; claws very large, deeply notched, rays subequal. Color in general very light yellowish; mesonotum and mesepimera dull reddish; antennæ ferruginous, black, or light brown above, growing lighter toward tips; tips of hind tibiæ and their tarsi somewhat infuscated; veins light yellowish brown; stigma, costal, and subcostal veins lighter, unicolorous.

One female. Colorado. (Coll. Am. Ent. Soc.) I have compared also a specimen collected at Ithaca, N. Y. (Coll. Cornell Univ.)

20. **Amauronematus excavatus** new species.

*Female.*—Length 7 mm.; robust; clypeus deeply and circularly emarginate, lobes narrow, rounded at tip; walls of ocellar basin distinctly defined; frontal crest deeply broken by the backward prolongation of the large oval antennal fovea; antennæ short, fourth joint longest; venation normal; stigma rather broad, circular on lower margin, widest at middle; sheath acuminate, rather pointed at tip; cerci short, inconspicuous. Color resinous, darker on thorax and vertex; ocellar basin and line connecting posterior ocelli black; veins light yellowish brown; stigma and costa lighter yellowish.

One female, without locality label. (Coll. Am. Ent. Soc.) This species seems to be somewhat intermediate between the genus to which it is now assigned and *Pteronus*.

21. **Amauronematus californicus** new species.

*Female.*—Length 6 mm.; rather robust, shining; clypeus distinctly, circularly notched, lobes rounded; frontal crest broad, stout, unbroken; ocellar basin with rounded, indistinct lateral walls; fovea indistinctly defined, extending laterally over bases of antennæ; antennæ very slender, elongate, filiform, third joint longest; venation normal; stigma elongate, narrow; sheath narrow, squarely truncate at tip; claws evenly but not very deeply cleft. Color light resinous yellow; antennæ brown above; basal joints darker; ocelli with very narrow black border; two black spots just back of mesoscutellum; veins light brown; stigma and costa light yellowish.

Two females. Los Angeles, Cal. D. W. Coquillett, collector. (Coll. U. S. Nat. Mus.)

## X. Genus CRŒSUS Leach.

*Crœsus* Leach. Zool. Misc., III, 1817, p. 129.

The characters distinguishing this genus are indicated in the table of genera. It is closely allied to both *Amauronematus* and *Pteronus* in the characters of the vertex, clypeus, and claws. The original descriptions of the two American representatives are reproduced without change.

### Crœsus latitarsus Norton.

1862. *Crœsus latitarsus* Norton. Proc. Ent. Soc. Phila., I, p. 199.
1867. *Crœsus latitarsus* Norton. Trans. Am. Ent. Soc. I, p. 84. (Cat., etc., p. 54.)
1881. *Crœsus latitarsus* Packard. Bull. 7, U. S. Ent. Comm., pp. 129, 184.
1882. *Crœsus latitarsus* Provancher. Nat. Can., XIII, p. 291.
1883. *Crœsus latitarsus* Provancher. Faun. Ent. Can. Hym., p. 740.
1885. *Crœsus latitarsus* Dimmock. Psyche, IV, p. 286.
1888. *Crœsus latitarsus* Jack. Psyche, V, p. 41.
1890. *Crœsus latitarsus* Packard. 5th Rept. U. S. Ent. Comm., p. 485.
1893. *Crœsus latitarsus* Dyar. Can. Ent., XXV, p. 246.
1894. *Nematus* (*Crœsus*) *latitarsus* Dalla Torre. Cat. Hym., I, p. 233.

*Female.*—Antennæ as long as body, black; body shining, blue black, a crescent-shaped elevation between antennæ; clypeus notched; labrum, mandibles and palpi piceous; mesothorax with confluent longitudinal punctures; legs black, the anterior pair piceous toward tip; posterior trochanters and basal half of all the tibiæ white; posterior tibiæ enlarged and very much flattened toward the tip; first joint of tarsi still wider, compressed, longer than remaining four joints together, its edges elevated to a rim on both sides; wings hyaline, a little smoky below stigma; a dot in middle of both second and third submarginal cells.

Massachusetts (Harris's Coll.), Pennsylvania (Coll. Am. Ent. Soc.). (Smithsonian Institution).

(Three females.) Quite rare. Wild cherry. August 16.

Bred by Mr. Walsh from larvæ feeding on birch.

### Crœsus laticulus Norton.

1869. *Crœsus laticulus* Norton. Trans. Am. Ent. Soc., II, p. 368. (Cat., etc., p. 222.)
1894. *Nematus* (*Crœsus*) *laticulus* Dalla Torre. Cat. Hym., I, p. 232.

*Female.*—Length 0.18 inch; black; tegulæ, a spot on sides of basal plates and of second and third segments of abdomen whitish; apex of mandibles and the legs ferruginous, with the apex of hinder femora, the apical two-thirds of their tibiæ and the most part of the first tarsal joint blackish; antennæ very long (0.36 inch), quite slender; each ocellus at the head of a pentagonal basin; a protuberance between antennæ, nasus incurved; some scattered subobsolete oval punctures on the head and mesothorax; scutel polished; pleura dull, but not punctured; tergum with delicate cross striæ; abdomen slender, cylindrical; hinder tibiæ one-half longer than first and second, somewhat enlarged, twice as wide as the others, with a deep channel down the upper side; all the joints of their tarsi enlarged and flattened, the first joint widest, but not as wide as tibiæ, the patellæ long and white, the claws with a strong inner tooth; wings ample, hyaline; nervures piceous; stigma black; first transverse submarginal nervure obsolete, except its rudiments near the nerves; second recurrent nervure received near the transverse nervure.

Two females. Massachusetts (Coll. Am. Ent. Soc.), Virginia (Peabody Institute, Salem).

## XI. Genus HOLCOCNEME Konow.

*Holcocneme* Konow. Deutsche Entom. Zeits. XXXIV, 1890, p. 232.

Body large; clypeus emarginate at apex; claws bifid or with subapical tooth; head and thorax more or less punctured, but little shining; stigma ovate at base, acuminate at apex, black; posterior tibiæ and tarsi thickened, the former deeply channeled exteriorly; hypopygium of male emarginate at apex; sheaths of female small, thickened.—Konow.

This genus seems to me to be of very doubtful standing. I have found no American representatives, and the European examples show a tendency toward the preceding form (*Crœsus*) in the enlargement of the hind tibiæ and metatarsus. The chief distinguishing character of the genus is the grooving of the hind tibiæ exteriorly, but this occurs to a greater or less extent in practically all Nematids.

## XII. Genus NEMATUS Jurine.

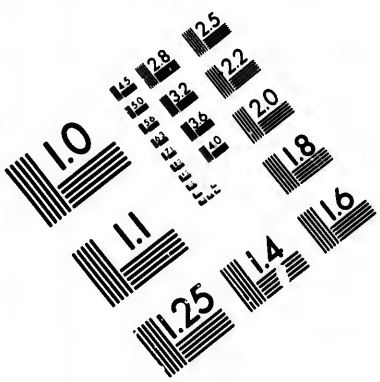
*Nematus* Jurine. Nouv. Méth. Class. Hym., 1807, p. 59.

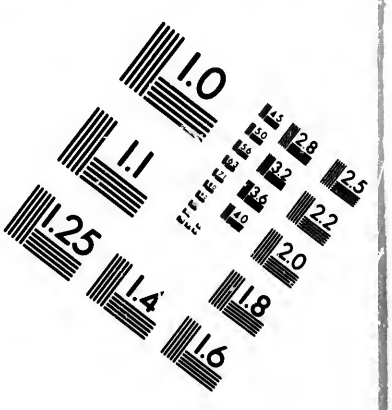
The characteristics of this genus, as indicated by the table of genera and an examination of the principal European specimens referred to it by Konow, are as follows:

Body robust; antennæ slender, tapering; clypeus more or less emarginate; hind tibiæ and tarsi simple; claws bifid; last ventral segment of the male emarginate at tip, not produced or pointed; eighth dorsal segment of male broadly, obtusely truncate at tip, not at all produced; sheath of female broad and thick and with the last dorsal segment greatly developed and constituting nearly half of the abdomen.

Konow assigned to this genus the group of species represented by the European *Nematus luteus* Pz., *abdominalis* Pz., *bilineatus* Klug., and a few others. The very large and thickened sheath, with long bordering fringe of hairs and large, thick, acuminately pointed ovipositor, together with the enormously developed lateral clasping portion of the last dorsal segment, at once distinguish this genus from all other Nematines. *Nematus unicolor* n. sp. is typical in the features indicated and exhibits a close relationship with *N. luteus* Pz. of Europe. It is the only undoubted representative of this genus as restricted occurring in this country. Of the three other American species, two (*N. pergandei* n. sp. and *N. chloreus* Norton) possess the peculiarities of sheath and ovipositor, but lack the unusual development of the last segment. The third (*N. mexicanus* Cameron) seems from the description to be a true *Nematus*.

The unusual development of ovipositor and adjoining parts in *unicolor* n. sp. and the European species would suggest some peculiarity of habit in ovipositing calling for such modification. Nothing in this direction seems to be indicated by the habits, so far as known, in the absence of direct observation on oviposition. The European species feed on *Alnus*, the larvæ resting on the upper surface of the leaves,

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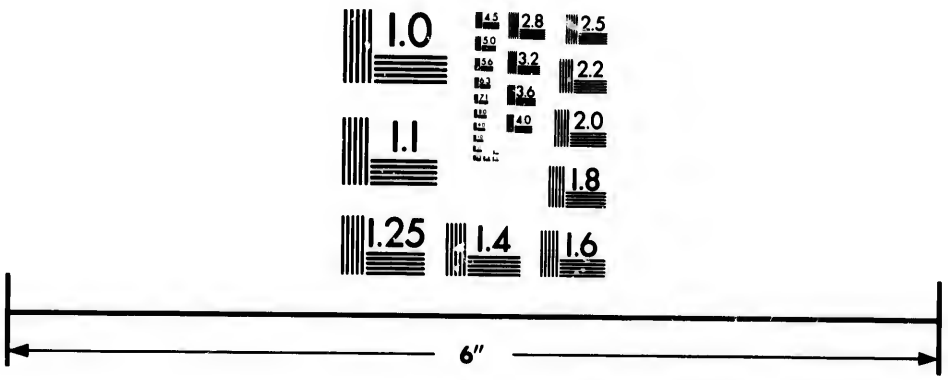



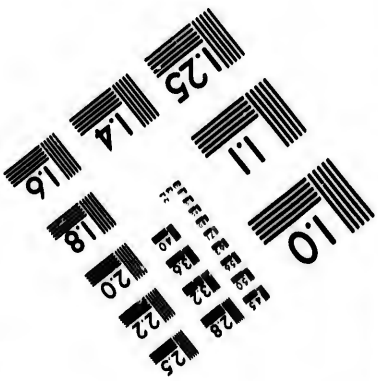


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skeletonizing them at first and in their later stages eating entirely through.

Mr. H. G. Dyar has described the larva of *unicolor* n. sp. (Trans. Am. Ent. Soc., XXII, p. 308), the food-plant being white birch, but in feeding habits agreeing with the European species.

TABLE OF SPECIES.

*Females.*

Last dorsal arc of abdomen enormously developed.
Claws bifid.
Wings slightly infuscated basally; stigma brown basally; dorsum pale.
1. *unicolor* n. sp.
Wings clear; stigma pale; metanotum and abdomen above black.
2. *mexicanus* Cameron.
Claws with minute inner tooth ..... 3. *pontanioides* n. sp.
Last dorsal arc not unusually developed.
Ocellar basin with distinct lateral walls and containing two small tubercles.
4. *pergandei* n. sp.
Ocellar basin with indistinct lateral walls and without tubercles.
5. *chlorens* Norton

**1. Nematus unicolor** new species.

1895. *Nematus unicolor* Dyar. Trans. Am. Ent. Soc., XXII, p. 308. (Larva.)

*Female.*—Length 7 mm.; rather robust, shining; clypeus deeply, rather narrowly notched, lobes large, rounded; ocellar basin scarcely present, deep furrow connecting anterior ocellus with antennal fovea; antennæ slender, scarcely tapering, setaceous, about as long as head and thorax, third, fourth, and fifth joints subequal; intercostal nearly at right angles with costa, interstitial or nearly so; third cubital with sides parallel; posterior wings with outer veins of discal cells interstitial, or nearly so; stigma moderately elongate; sheath tapering, pointed, and with terminal abdominal segment enormously developed, representing nearly half of abdomen; cerci very long, slender, almost as long as first joint of hind tarsi; claws rather large, inner ray very distinctly shorter than outer. Color uniformly reddish yellow; wing veins and stigma yellowish brown; antennæ infuscated basally; ocelli very narrowly margined with black; basal plates more or less infuscated; wings hyaline, veins brown, stigma and costa yellow, former brown basally.

Three females, one from Mount Hood, Oreg. (Coll. Am. Ent. Soc.), and two reared by Mr. H. G. Dyar from larvæ on white birch collected in Green Valley, New York (Coll. Dyar).

**2. Nematus mexicanus** Cameron.

1881. *Nematus mexicanus* Cameron. Trans. London Ent. Soc., p. 481.

*Female.*—Livid, testaceous; face, sides and apex of abdomen above, and legs obscure livid yellow; antennæ, metanotum, and back of abdomen except at apex, apex of hind tibiæ, and tarsi black; anterior tibiæ inclining to fuscous; wings clear hyaline; costa and stigma whitish yellow; antennæ shorter than the abdo-

men, almost glabrous, third joint a little shorter than fourth; vertex raised in center; frontal area a deep wide depression; antennal fovea large, longer than wide; clypeus deeply incised; palpi fuscous; wings longish; second cubital cellule double the length of third, not angled where the recurrent nervures are received; third cellule a little widened at apex; the second recurrent nervure received a little in front of third transverse cubital; abdomen larger than the head and the thorax together, narrowed toward the apex, its last segment largely developed above; cerci long; ovipositor long, nearly half the length of the abdomen; the sheath at apex pilose; blotch small; cerci large, white; claws bifid, spurs shortish. The vertex and mesonotum are very finely punctured; on the middle lobe of the latter is a central furrow; the extreme apex of the scutellum is black, and there is a narrow obscure black line down its center.

Length 7 mm.

Closely allied to the European *N. hæmorrhoidalis* Spin. and to the North American *N. chloreus* Norton. The occurrence of a *Nematus* so far south is of much interest, this being the first record of that northern genus in Central America.

*Habitat:* Northern Sonora, Mexico (Morrison).

The type of this species was not procurable and the original description is quoted without alteration.

3. **Nematus pontanioides** new species.

*Female.*—Length 5 mm.; rather robust; clypeus very deeply and circularly emarginate, lobes rounded; walls about ocellar basin and the frontal crest rounded, indistinct; vertex smooth, shining; antennal fovea broad, shallow; antennæ not longer than head and thorax, slender, filiform, joints 3, 4, and 5 subequal; second recurrent received near second cubital; third cubital cell very elongate, three times as long as wide, narrow; stigma broad; sheath large, tapering, sharply acuminate, occupying with overlapping terminal dorsal sclerite nearly one-half of the abdomen; cerci very long, extremely slender, as long as basal joint of hind tarsi; inner tooth of claw minute. Color honey yellow and dark brown; spot including ocelli and extending to antennæ, anterior lobe of mesonotum, metanotum, abdomen except last segment and sheath, pleura, and pectus brown; antennæ brown, fulvous beneath; femora inclined to brownish; coxæ basally dark brown, almost black; wings nearly hyaline; veins yellowish brown; stigma yellowish hyaline, darker basally.

One female. Mount Hood, Oreg. (Coll. Am. Ent. Soc.)

In character of antennæ and development of ovipositor and last segment of the abdomen, this species is closely allied to *unicolor*, but differs in the structure of the claws. The last segment of the abdomen is enormously developed, and the long, sharply pointed sheath and long cerci may indicate a gall-making habit, whence the designation *pontanioides*. The inner tooth of the claw is very minute and close to the tip, but in spite of this marked divergence from the characters of the claw of the genus the features of abdomen and ovipositor are so striking as not to permit of its being placed elsewhere.

4. **Nematus pergandei** new species.

*Female.*—Length 7 mm.; exp. al. 15 mm.; very robust, short; head not broadened posteriorly; clypeus broadly, circularly emarginate; lobes broad, obtuse; frontal crest very large, obtusely rounded; lateral walls of ocellar basin sharply defined; basin filled by two tubercles; antennal fovea very broad, shallow; antennæ little longer than head and thorax, very slender, scarcely tapering, joints 4 and 5 subequal, shorter than 3; sheath thick, squarely truncate, tubular; venation normal; stigma ovate at base, tapering rather regularly toward the somewhat truncate apex; claws very deeply cleft, rays nearly equal. Color luteous, shining; face below antennæ, orbits, pronotum, most of venter, and legs, pallid; dorsal area of head, mesonotum, margin of abdomen above, basal half of mesepimera, and sheath reddish yellow; lateral margin of mesonotum, most of metanotum, broad stripe covering dorsal center of the segments of the abdomen except the last, black; antennæ brown, fulvous beneath; ocelli ringed with black and a small black or brownish spot just at base of each antenna; wings hyaline; veins light yellowish brown; stigma and costa yellowish, almost hyaline.

One female. Washington, D. C. (?). (Coll. Am. Ent. Soc.)

5. **Nematus chloreus** Norton.

1867. *Nematus chloreus* Norton. Trans. Am. Ent. Soc., I, p. 221. (Cat., etc., p. 83.)
1872. *Nematus chloreus* Norton. Trans. Am. Ent. Soc., IV, p. 80.
1888. *Nematus chloreus* Provancher. Add. Faun. Can. Hym., p. 348.

*Female.*—Length 5 to 5.5 mm.; very robust; head and thorax finely punctured, opaque; clypeus nearly truncate; vertex smooth; lateral ridges of ocellar basin not very prominent, rounded; basin very shallow and indistinct; crest rather large, rounded; antennal fovea very shallow, indistinct; antennæ short, not as long as head and thorax, slender, tapering, third joint very little longer than fourth; stigma broad basally, tapering regularly nearly to apex; apex of costa very greatly thickened; sheath thick, short, scarcely projecting, margined with long, not very numerous curved hairs; cerci rather long, slender; claws large, deeply notched. Color yellowish ferruginous; mesonotum, mesepimera, margin of abdomen dorsally, and sheath somewhat inclined to reddish; antennæ, spot on either side of mesoscutellum, apex of same and metanotum except metascutum, basal plates and central area of abdomen above, black; antennæ lighter beneath, especially toward apex; veins brown, stigma and costa yellowish.

Two females from Texas, one Norton's type (Colls. U. S. Nat. Mus. and Am. Ent. Soc.)

In general characteristics this species comes very near *Nematus pergandei* n. sp., but it is less than one-half the size of the latter, and differs in other details.

## XIII. Genus PACHYNEMATUS Konow.

*Pachynematus* Konow. Deutsche Entom. Zeits., XXXIV, 1890, p. 238.

Body short, rather stout; clypeus emarginate at apex; inner tooth of claw generally minute and at right angles to outer; antennæ of the male long, more or less compressed; female shorter, subsetaceous, usually black; pentagonal area of vertex distinct; eighth dorsal segment of the male broad, wide at tip; hypopygium subtriangular, produced at apex; sheath of female short, stout.—Konow.

This genus is characterized chiefly by the short inner tooth of claw projecting nearly at right angles with the claw and the emarginate clypeus, together with the distinctly developed ridges to the ocellar basin (pentagonal area). Its American representatives may be readily divided into three well-marked groups. The first is the smaller of the three groups and is characterized by the large, greatly projecting, and rounded, flattened sheath of the female. The rest of the species are separated into two well-marked groups by the characters of the head and antennæ. In one the head is very strongly developed and widens notably back of the compound eyes, particularly in the case of the females, and with the males the antennæ are very long, cylindrical, and not at all or scarcely compressed. In the other group the head narrows in both sexes back of the compound eyes, and the antennæ in the males are comparatively short, usually robust, and very strongly compressed. The first of these latter subdivisions, or the second group of species, has a typical representative in the wheat and grass sawfly (*Pachynematus extensicornis* Norton), the habits of which are described and illustrated in Insect Life, IV, pp. 174–177, fig. 14. The species was then referred to *marylandicus*, but it now appears that Norton's earlier description of *extensicornis* was of the male of this species. The close similarity of the species in this group in structural characters suggests a like similarity in habits, and we may therefore expect most of them to be grass feeders. They represent all sections of the country, from Maine to California. The third group approaches very closely in characters the following genus (*Lygæonematus*) in that the clypeus is often only slightly emarginate, and the separation and reference is therefore not entirely satisfactory in all cases.

TABLE OF SPECIES.

*Females.*

I. Sheath very large, projecting free at least one-half its length, not or scarcely tapering, rounded at apex.

Second recurrent usually interstitial; prevailing color black or dark brown.

Lobes of clypeus triangular; clypeus and labrum very hairy; venter infuscated ..... 1. *dimmockii* Cresson.

Lobes broad, rounded; clypeus and labrum nearly smooth; venter pallid. 2. *ruralis* Cresson.

Second recurrent not interstitial; prevailing colors yellow or resinous. 3. *ocreatus* Harrington.

II. Sheath normal, but slightly projecting; tip usually obliquely truncate or tapering; head strongly developed and widening back of compound eyes; second recurrent vein usually interstitial; rather robust species; stigma and costa usually hyaline.

Metanotum more or less yellow; tergum yellow ..... 4. *auroctiacus* n. sp.

Metanotum and tergum black.

Head (except usually a spot about ocelli) and more or less of mesonotum pale.

Mesonotum pale or with two or three black spots; body beneath pale except rarely black spot on pectus and infuscated bases of femora.

Stigma and costa pale; wings hyaline.

Sheath broad, obliquely truncate; large species.

5. *extensicornis* Norton.

Sheath rather narrow, tapering regularly ..... 6. *affinis* n. sp.

Stigma and costa pale; wings infuscated ..... 7. *suadus* Cresson.

Stigma and costa dark brown ..... 8. *auratus* n. sp.

Mesonotum mostly black, with one or two pale spots, or sutures pale; mesepimera black, except sometimes lateral light spot; venter more or less infuscated; femora and coxæ black basally.

Mesepimera black ..... 9. *graminis* n. sp.

Mesepimera with lateral white spot ..... 10. *pleuricus* Norton.

Head black; orbits black or strongly infuscated; thorax and abdomen black except sometimes central area of venter.

Stigma and costa pale.

Head and thorax with long, dense pubescense; stigma narrow, acuminate; reddish spot on mesepimera ..... 11. *pubescens* n. sp.

Head and thorax not unusually pubescent; stigma robust; mesepimera black.

Femora and venter mostly pale; large, robust species.

12. *montiragus* n. sp.

Femora and venter black; small species. 13. *coloradensis* n. sp.

Stigma brown or black.

Labrum, angles of pronotum, and tegulæ pale.

Clypeus black; bases of femora infuscated .. 14. *robustus* n. sp.

Clypeus with pale tips; femora pale ..... 15. *clypeatus* n. sp.

Labrum, angles of pronotum, and tegulæ black.

16. *ater* McGillivray.

III. Sheath as above; head narrowing more or less back of compound eyes; usually slender, elongate, black species, with brown costa and stigma.

Sheath narrow, regularly rounded at tip; stigma acuminate; venter pale; pectus black ..... 17. *nigropectus* Cresson.

Sheath moderately robust, more or less obliquely truncate, tip obtusely pointed; stigma broad, not acuminate.

Tergum reddish yellow; head coarsely, rugosely punctured.

18. *punctulatus* n. sp.

Tergum black, except lateral rufous spot on segments 2 to 5.

19. *abdominalis* n. sp.

Tergum black.

Femora pale ..... 20. *hoodi* n. sp.

Anterior femora pale; hind infuscated at tip .... 21. *corniger* Norton.

Femora all more or less infuscated or black.

Anterior femora light basally; basal half posterior tibiæ white.

22. *subalbatus* Norton.

Anterior femora infuscated basally, paling apically; posterior tibiæ gradually infuscated, more strongly toward tip.

23. *palliventris* Cresson.

*Males.*

I. (No male representatives).

II. Head not narrowed back of compound eyes, usually expanding; antennæ slender, not or scarcely compressed, and nearly if not quite as long as the entire insect.

1. Black dorsally and ventrally.

. Stigma and costa more or less infuscated.

Legs, except tibiæ and tarsi, black.

Mouth parts and orbits black..... 5. *extensicornis* Norton.

Mouth parts and orbits pale..... 6. *affinis* n. sp.

Legs, except bases of femora, yellow..... 24. *tritici* n. sp.

Stigma and costa hyaline..... 25. *apicalis* n. sp.

2. Venter and more or less of tergum pale.

Wings hyaline; stigma brown.

Head pale, except large spot on vertex..... 8. *auratus* n. sp.

Head black ..... 4. *aurantiacus* n. sp.

Wings strongly infuscated; stigma and costa smoky.. 26. *infumatus* n. sp.

3. Head and thorax mostly yellow; abdomen black, except tip; stigma and costa hyaline ..... 27. *thoracicus* n. sp.

III. Head usually distinctly narrowed back of compound eyes, never expanding; antennæ usually shorter, stouter, and compressed.

1. Black, including all of venter.

Pronotum and tegulæ black; legs beyond base of femora yellow, infuscated..... 28. *koebelei* n. sp.

Pronotum, tegulæ, and legs reddish yellow ..... 29. *occidentalis* n. sp.

2. Black; venter more or less pale.

Orbits pale, or head with black limited to spot about ocelli.

30. *carolinensis* n. sp.

Orbits black or strongly infuscated.

Clypeus deeply emarginate; triangle between antennæ and clypeus white; inner tooth of claw large..... 31. *evangeli* n. sp.

Clypeus deeply emarginate; triangle black; inner tooth of claw minute; stigma very narrow, tapering ..... 32. *minutus* n. sp.

Clypeus broadly emarginate, approaching truncate; triangle black; claws normal.

Clypeus black; venter infuscated laterally ..... 20. *hoodi* n. sp.

Clypeus with pale tips.

Legs pale, except extreme tips of posterior tibiæ and their tarsi.

22. *subalbatus* Norton.

Legs pale, except tips of hind femora above and apical third of hind tibiæ and the hind tarsi..... 21. *corniger* Norton.

Legs reddish yellow; femora infuscated basally; abdomen usually entirely reddish yellow beneath.

33. *nevadensis* n. sp.

INDEX TO SPECIES OF PACHYNEMATUS.

**1. Pachynematus dimmockii** Cresson.

1880. *Nematus dimmockii* Cresson. Trans. Am. Ent. Soc., VIII, p. 6.

*Female.*—Length 8 mm.; exp. al. 18 mm.; rather robust, elongate, shining; clypeus deeply emarginate, lobes triangular, rounded, and with labrum clothed with long hairs; frontal crest and lateral walls of ocellar basin distinctly but not strongly elevated, former slightly broken at middle; antennal fovea shallow, indistinct; antennæ slender, as long as head and thorax, fourth joint much longer than third; second recurrent vein interstitial with second transverse cubital; outer veins of discal cells of hind wings interstitial; stigma rather broad, ovate or somewhat tapering; sheath very long, rounded at apex, projecting free one-half its length, blades thin and closely applied; cerci long, very slender, filiform; inner tooth of claw near apex rather broad. Color brownish black; abdomen lighter, inclined to fulvous; face below antennæ, upper and posterior orbits, pronotum, tegulæ, and legs except bases of coxæ, reddish yellow, strongly infuscated, particularly posterior tibiæ and all the tarsi; veins, including stigma, dark brown.

One female, Cresson's type. Collected by Mr. George Dimmock near the summit of Mount Washington, New Hampshire. (Coll. Am. Ent. Soc.)

**2. Pachynematus ruralis** Cresson.

1880. *Nematus ruralis* Cresson. Trans. Am. Ent. Soc., VIII, p. 5.

*Female.*—Length 8 mm.; head strongly developed back of compound eyes; clypeus angularly incised, lobes broad and rounded; ridges about anterior ocellus wanting; pentagonal area smooth, not depressed; antennal fovea sharply defined anteriorly; antennæ short, slender, joints 4 and 5 subequal and slightly longer than 3; intercostal vein nearly interstitial with basal; second cubital and second recurrent interstitial or nearly so, as also the outer veins of discal cells of hind wings; sheath very prominent, elongate, projecting free one-half its length, regularly tapering on both margins to rounded apex, blades thin, closely applied; cerci very slender, filiform; inner tooth of claw very minute. Color brownish black; orbits except narrow inner margins, face below base of antennæ, pronotum, tegulæ, abdomen beneath,

last dorsal segment, sheath, and legs yellowish white, with more or less brownish infuscation; bases of coxæ brown; femora and tips of tibiæ and tarsi brownish; wings slightly infuscated, nearly hyaline; veins, including stigma, brown.

One female, Cresson's type. Nevada. (Coll. Am. Ent. Soc.)

3. **Pachynematus ocreatus** Harrington.

1889. *Nematus ocreatus* Harrington. Can. Ent., XXI, p. 95.

*Female.*—Length 8.5 mm.; moderately robust; head expanding somewhat back of compound eyes; clypeus broadly, rather deeply emarginate, lobes rounded; ocellar basin with distinct and broad lateral walls; crest strong, unbroken; fovea shallow; antennæ slender, joints 3 and 4 subequal, fifth somewhat shorter; venation normal; sheath of ovipositor very long and large, projecting one-half its length beyond tip of abdomen, apex broadly rounded, blades thin, translucent, closely applied; cerci very long, slender; claws with minute inner tooth. Color shining resinous yellow; antennæ, spot on either side of lateral lobes of mesonotum, apex of scutellum, a few indeterminate marks on metanotum, and narrow border of basal plates brownish black; extreme tips of tibiæ brown; wings hyaline, stigma paler basally, costa yellow.

Redescribed from Harrington's type specimen. A specimen reared by Mr. Harrington from larva on spruce agrees very closely with this species, particularly in possessing the unusually developed sheath. In color the legs are a little more inclined to reddish and the hind tarsi and tip of sheath are distinctly infuscated. (Coll. Harrington.)

4. **Pachynematus aurantiacus** new species.

*Female.*—Length 9 mm.; robust; abdomen at middle much wider than thorax; head not narrowing back of compound eyes; clypeus distinctly but broadly incised, lobes broad, rounded; ocellar basin with sharply raised limiting walls; frontal crest sharp, unbroken; fovea deep, circular, distinctly limited; antennæ slender, about as long as head and thorax, tapering, third joint longer than fourth; venation normal, except that the second recurrent is sometimes interstitial or nearly so; stigma moderate, widest at middle, regularly rounded on lower margin; sheath broad, rather suddenly truncate near apex; cerci slender, not tapering; inner tooth of claw obtuse, remote from apex. Color orange yellow; inner orbits, head, above antennæ except upper and posterior orbits, broad stripe on the anterior and lateral lobes of mesonotum, apex of scutellum, postscutellum, spot on either side of cenchri, metascutum, center and sides of the basal plates, lower half of mesoepimera, corresponding sclerite of the metathorax together with spot on mesepisterna, black; extreme tips of posterior tibiæ and their tarsi infuscated; antennæ dark brown above, reddish ferruginous beneath; wings hyaline; veins, except costa, brown; stigma brown, costa yellow.

*Male.*—Length 6.5 mm.; structurally for the most part as in female; head not narrowing back of compound eyes; antennæ nearly as long as body of the insect, strongly tapering, robust, and somewhat compressed basally; procidentia broad, rounded, not projecting more than half its width, strongly keeled. Color black, shining; apex of clypeus, labrum, palpi, angles of pronotum, tegulæ, legs except bases of coxæ, venter, and most of tergum yellowish ferruginous; base of the dorsal segments, particularly of the first and second and fifth to seventh, brownish black; in some specimens all the segments are brownish black basally; tips of posterior tarsi and sometimes extreme tips of posterior tibiæ infuscated; antennæ reddish brown; wings hyaline, costal veins pale, stigma and veins otherwise brown.

Four females and five males. Montana. (Coll. Am. Ent. Soc.)

### 5. Pachynematus extensicornis Norton.

1861. *Nematus extensicornis* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 159.
1861. *Nematus marylandicus* Norton Proc. Am. Ent. Soc. Phila., III, p. 7.
1867. *Nematus extensicornis* Norton. Trans. Am. Ent. Soc., I, p. 117. (Cat., etc., p. 59.)
1867. *Nematus marylandicus* Norton. Trans. Am. Ent. Soc., I, p. 197. (Cat., etc., p. 59.)
1867. *Nematus aureopectus* Norton. Trans. Am. Ent. Soc., I, p. 219. (Cat., etc., p. 81.)
1878. *Nematus extensicornis* Provancher. Nat. Can., X, p. 54.
1883. *Nematus extensicornis* Provancher. Add. Faun. Ent. Can. Hym., p. 185.
1891. *Nematus marylandicus* Riley and Marlatt. Insect Life, IV, p. 174, fig. 14.

*Female.*—Length 7 to 8.5 mm.; very robust species; abdomen particularly broad; head very much enlarged back of compound eyes; clypeus very shallowly excavated, lobes short, rounded; frontal crest and sides of ocellar basin strongly and distinctly defined, the former very minutely notched; antennal fovea extending laterally over bases of antennæ; antennæ moderately slender, tapering, joints distinctly defined, 1 and 2 equal; second recurrent vein interstitial with second transverse cubital; third cubital cell two and one-half times as long on lower margin as wide at base; discal cells of hind wings long, narrow, upper usually exceeding the lower; stigma rather broad, oval, not tapering more at apex than at base; sheath moderately broad and thick, obliquely truncate, upper edge nearly straight; cerci rather long, not tapering; claws with a very minute inner tooth, about ¼ of length of claw from apex. Color resinous or sulphur yellow; antennæ, small spot including ocelli, stripe on lateral lobes of mesonotum, spot on either side of and on base of scutellum, metanotum, tergum except narrow lateral margin and the two terminal segments, and sheath brownish black; bases of posterior coxæ, apices of their tibiæ and their tarsi, infuscated. There is ordinarily a faint trace of a black stripe on the middle lobe of the mesonotum, and in light specimens the black markings of the mesonotum are nearly obliterated, and the abdomen

is more or less banded with yellow on the posterior margin of the segments. The wing veins are light brownish for the most part; the costa and outer half of subcosta, the stigma, and the bases of most of the veins reaching the body of both fore and hind wings are nearly hyaline.

*Male.*—Length 6 to 7.5 mm.; rather slender, elongate, shining; structural details in general as in female; head not narrowed back of compound eyes; frontal crest is less distinctly raised and more distinctly notched; antennæ not compressed, almost as long as the body, and the nodes are distinctly enlarged, angular, clothed with distinct, rather short, black pubescence, third joint very robust and third to fifth subequal; procidentia very broad, slightly tapering and rounded at apex; hypopygium more or less excavated at tip. Color black; tips of femora, tibiæ, and hypopygium yellowish, infuscated; tarsi, cerci, and tips

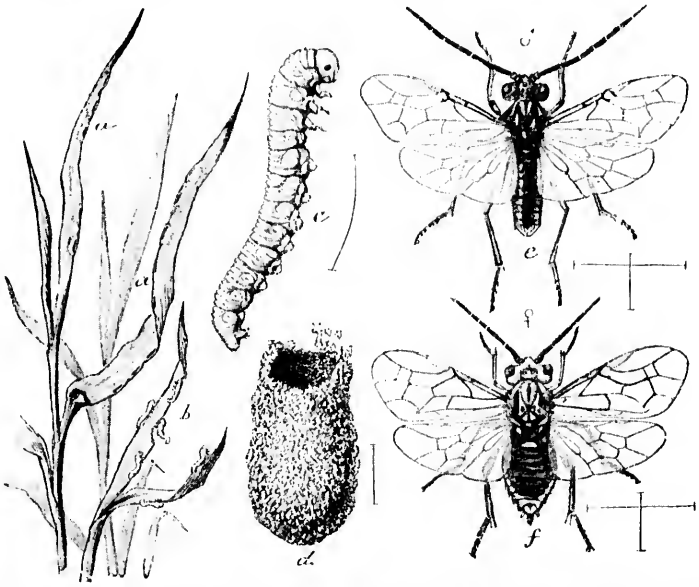

FIG. 9.—*Pachynematus extensicornis: a*, eggs in wheat; *b*, young larvæ; *c*, mature larva; *d*, cocoon; *e*, adult male; *f*, adult female; *a* and *b*, natural size; *c* to *f*, enlarged. (From Insect Life.)

of tibiæ more distinctly infuscated; posterior orbits tinged with fulvous; veins dark brown; stigma and costa yellowish brown, the former lighter at center.

Represented by many specimens of both sexes, some of them reared from larvæ taken on wheat in Indiana by Mr. Webster and others collected throughout the Northeastern United States. (Colls. U. S. Nat. Mus., Am. Ent. Soc., and Cornell Univ.)

6. **Pachynematus affinis** new species.

*Female.*—Length 5.5 to 6 mm.; very robust, shining; head greatly dilated back of eyes; clypeus very broadly and not deeply excavated,

lobes rounded; vertex roughened; lateral walls of ocellar basin irregular, not very distinctly raised; frontal crest rather sharply but not strongly developed, unbroken; antennal fovea shallow, extending widely over bases of antennæ; antennæ considerably longer than head and thorax, very slender, tapering, joint 4 as long as or longer than 3; second recurrent interstitial with second transverse cubital; upper discal cell of hind wings very slightly exceeding lower, venation otherwise normal; stigma broad, regularly rounded on lower margin; sheath rather narrow, tapering, straight on upper margin, obtusely pointed; cerci long, slender, filiform; inner tooth of claw minute, remote from apex. Color luteous; antennæ, small spot including ocelli, spot on lateral lobes of mesonotum, spot on either side and apex of scutellum, postscutellum and central region of metanotum, basal plates, tergum (except lateral margins and last two segments), and sheath black; apical margins of segments yellow in the lighter specimens; extreme apices of hind tibiæ, the hind tarsi, bases of posterior coxæ, and small spot beneath anterior wings infuscated; stigma, costa, upper edge of subcosta, and bases of all veins reaching the body hyaline; other veins brown.

*Male.*—Length 6 mm.; not very robust, shining, head expanding beyond compound eyes posteriorly; clypeus scarcely emarginate, nearly truncate; vertex roughened; walls about ocellar basin rounded, indistinct, basin narrowly excavated at center; antennal fovea circular, shallow, extending laterally over bases of antennæ; antennæ long, tapering, cylindrical, basal joints slightly compressed, joints nodose at tip, fourth longest; venation normal, except that the second recurrent and second transverse cubital and the outer veins of discal cells of hind wings are interstitial; stigma moderately broad, rounded beneath, tapering or acuminately pointed; procidentia projecting only about half its width, broadly truncate at apex; claws with minute inner tooth remote from apex. Color black; clypeus, mouth parts, upper and posterior orbits, apices of femora, the tibiæ and tarsi, and extreme apex of abdomen, particularly hypopygium, yellowish ferruginous, more or less infuscated, particularly at apices of posterior tibiæ and all of tarsi; veins brown; stigma and costa light brown.

Eight females and four males. Montana. (Coll. Am. Ent. Soc.)

**7. Pachynematus suadus** Cresson.

1880. *Nematus suadus* Cresson. Trans. Am. Ent. Soc., VIII, p. 10.
1886. *Nematus suadus* Provancher. Add. Faun. Can. Hym., p. 24.

*Female.*—Length 6.5 mm.; very short and robust; head strongly expanding posteriorly to compound eyes; clypeus broadly and shallowly excavated; frontal crest and sides of ocellar basin indistinct; vertex somewhat roughened; antennal fovea almost wanting; second recurrent interstitial with second transverse cubital; discal cells of hind wings of about equal length; third cubital cell but little more

than twice as long as wide at base, its upper and lower sides of equal length; stigma oval at base, rather acute at apex; sheath narrow and pointed at tip, upper edge straight; cerci prominent, not tapering; inner tooth of claw distinct. Color shining honey yellow; antennæ, narrow spot connecting ocelli, line on the anterior and lateral lobes of mesonotum, mesopostscutellum, metascutum, center of basal plates, and the bases of the first six dorsal segments black or fuscous; sheath reddish fuscous, almost black; tarsi infuscated, particularly posterior pair; wings infuscated; veins light yellowish brown; stigma and costa nearly hyaline.

Two females, labeled "F. B." and "N. H.," Cresson's types. (Coll. Am. Ent. Soc.)

8. **Pachynematus auratus** new species.

*Female.*—Length 8 mm.; very robust; abdomen very much wider than thorax, somewhat flattened; head strongly expanding back of eyes, shining; clypeus distinctly but shallowly and broadly emarginate, lobes rounded; vertex roughened; frontal crest and lateral walls about ocellar basin rounded, indistinct, basin scarcely excavated; antennal fovea deep, circular, with lateral channels branching out over bases of antennæ; antennæ but little longer than head and thorax, slender, tapering, joints 3 to 5 subequal; venation normal, except that the second recurrent vein is interstitial, or nearly so, with the second transverse cubital, and the outer veins of the discal cells of the posterior wings are nearly interstitial; stigma broad, regularly rounded beneath; sheath rather narrow, slightly excavated on upper margin, rather sharply pointed at apex; inner tooth of claw minute, remote from apex. Color orange yellow; antennæ, small spot on vertex including ocelli, central line on scutellum and basal half of same, central area of metanotum, tergum except narrow lateral margin, apex of sixth and all of terminal segments, extreme bases of posterior coxæ, and the outer margin of sheath black; tips of posterior tibiæ and their tarsi infuscated; veins, including stigma and costa, except basal third of latter, dark brown.

*Male.*—Length 6.5 mm.; much more slender than female, but less so than male of *marylandicus;* structurally much as in female; head not narrowing back of compound eyes; antennæ long, slender, not noticeably compressed; procidentia large, triangular, projecting, obtusely rounded at tip. Color black, shining; face below antennæ, posterior and upper orbits, pronotum, tegulæ, venter extending over dorsal edge, narrowly on basal segments and more broadly toward apical ones, legs entirely except bases of coxæ, yellowish ferruginous; extreme tips of posterior tibiæ, with tarsi, slightly infuscated; wings hyaline; veins colored as in female.

Four females and two males. Montana. (Coll. Am. Ent. Soc.)

This species is very closely allied to the last in general characteristics, but is easily distinguished from it, also from *extensicornis*, with

which it agrees more nearly in point of size. The three species together form a very closely allied group, and doubtless have similar habits.

9. **Pachynematus graminis** new species.

*Female.*—Length 6.5 mm.; head dilated back of eyes; clypeus emarginate, almost truncate; antennal fovea distinct and breaking slightly through the frontal crest, the latter extending indistinctly to the orbits; second recurrent interstitial with the second cubital cross nerve; venation otherwise normal; stigma evenly rounded on lower margin; sheath rather broad, somewhat acuminately pointed, with straight upper margin; cerci very slender. Color brownish black; head yellowish, except area about ocelli and bases of antennæ; pronotum, tegulæ, abdomen beneath, terminal dorsal arcs, and most of legs yellowish white; more or less of base of scutellum whitish; bases of coxæ, extreme bases of femora, apices of tibiæ and the tarsi brownish, or more or less strongly infuscated; wings clear; veins brownish; stigma and costa almost hyaline.

One female. Nevada. (Coll. Am. Ent. Soc.)

10. **Pachynematus pleuricus** Norton.

1867. *Nematus pleuricus* Norton. Trans. Am. Ent. Soc., 1, p. 208. (Cat., etc., p. 70.)

*Female.*—Length 6.5 mm.; rather robust, shining; head dilated back of eyes; clypeus rather shallowly and broadly emarginate; walls about the ocellar basin broad and rounded, crest unbroken, fovea extending laterally over bases of antennæ; antennæ slender, filiform, joints 4 and 5 equal and longer than 3; sheath narrow, tapering, tip obtusely pointed; venation normal, except that the first cubital is nearly hyaline; claws with minute inner tooth. Color black and pallid or resinous; antennæ, spot on vortex including ocelli and reaching to bases of antennæ, large spot on each of the anterior lobes of mesonotum, apex of scutellum with spot on either side, metanotum, tergum except tip, mesepimera except large lateral spot, more or less of base of venter, bases of coxæ, trochanters, and bases of femora black; extreme tips of tibiæ, particularly hind pair, and tarsi strongly infuscated; sheath brown; except as noted, resinous yellow; wings hyaline; veins brown; stigma and costa hyaline.

Two females. Colorado, C. P. Gillette, collector (Coll. U. S. Nat. Mus.), and Idaho (Coll. Cornell Univ.). Norton's type specimens are lost.

11. **Pachynematus pubescens** new species.

*Female.*—Length 8 mm.; robust, shining; head dilated back of eyes; clypeus broadly, shallowly notched; ocellar basin rather indistinctly defined, crest low, unbroken; antennal fovea triangular; head very coarsely roughened with small elevations and, together with thorax, densely clothed with long whitish pubescence; antennæ slender, joints

4 and 5 subequal, longer than 3; sheath short, tapering, obtusely pointed; claws with minute inner tooth; venation normal, except that the second recurrent is interstitial with the second cubital; stigma very narrow and acuminate. Color black; tips of clypeus, mouth parts, extreme angles of pronotum, tegulæ, tip of abdomen except sheath, and outer half of femora reddish yellow; tibiæ pale yellowish; tarsi slightly infuscated; sides of mesepimera slightly reddish; wings hyaline, veins dark brown; costa and stigma hyaline.

Two females. Mount Washington, N. H. One labeled as having been taken at an elevation of about 6,000 feet, July 9, 1891. (Coll. Cornell Univ.)

12. **Pachynematus montivagus** new species.

*Female.*—Length 8 mm.; robust; head dilated back of eyes; head and thorax opaque from rather fine and dense puncturing, together with very short and inconspicuous pubescence; clypeus broadly and shallowly emarginate; pentagonal area distinctly defined, lateral walls sharp, minute; crest unbroken, not prominent; fovea oval; antennæ short, slender, tapering, joints 3 and 4 subequal; sheath short, tapering; claw with short inner tooth; venation normal, except that second recurrent is interstitial with second cubital; stigma broad, rounded beneath, scarcely tapering. Color black; labrum, angles of pronotum, tegulæ, extreme tip of abdomen, venter for the most part, and legs yellowish, inclined to reddish on femora; coxæ except tips and extreme bases of femora infuscated; tips of posterior tibiæ and their tarsi brownish; abdomen with brownish spots beneath, noticeably at base; wings hyaline, or nearly so; veins brown; stigma and costa light yellowish, almost hyaline.

One female. Mount Washington, N. H. (Coll. Cornell Univ.)

This species resembles the preceding in size and general characteristics, but diverges notably in the character of the stigma and pubescence of head and thorax.

13. **Pachynematus coloradensis** new species.

*Female.*—Length 6 mm.; moderately robust, shining; head dilated back of eyes; clypeus broadly, circularly emarginate; pentagonal area distinctly defined, but walls rounded; crest low, unbroken; fovea shallow, extending over bases of antennæ; antennæ slender, tapering, joint 4 slightly longer than 3; venation normal, except that the second recurrent is nearly interstitial with second cubital; stigma rounded, scarcely tapering; sheath obliquely tapering on lower margin, pointed; claws with minute inner tooth. Color black, shining; posterior orbits, mouth parts including tips of clypeus, angles of pronotum, tegulæ, tip of abdomen except sheath, outer third of femora, and the tibiæ and tarsi pallid more or less infuscated, particularly tarsi and orbits;

wings hyaline, or nearly so; veins light brown; stigma and costa pale, nearly hyaline.

One female. Colorado. C. P. Gillette, collector. (Coll. U. S. Nat. Mus.)

14. **Pachynematus robustus** new species.

*Female.*—Length 6 mm.; short, very stout; head dilated back of eyes; clypeus rather shallowly but distinctly emarginate; frontal crest well defined, unbroken; antennal fovea circular, deep; head very coarsely and rugosely punctured; antennæ very slender, elongate, joints 3 and 4 subequal; intercostal more than twice its length anterior to basal vein; second recurrent interstitial or nearly so with second cubital, venation otherwise normal; stigma large, widest near base; sheath robust, slightly acuminate toward apex; cerci long, filiform. Color black; labrum, angles of pronotum, tegulæ, more or less of the ventral segments of abdomen, the apex of the last dorsal segment, and legs for the most part light yellowish brown; coxæ basally strongly infuscated; femora, apices of tibiæ, and the tarsi dark brown; wings hyaline; veins and stigma brown; costa yellowish.

One female. Montana. (Coll. Am. Ent. Soc.)

15. **Pachynematus clypeatus** new species.

*Female.*—Length 6.5 mm.; somewhat elongate, shining; head rather coarsely punctured, widening noticeably back of compound eyes; clypeus not very deeply emarginate, lobes short, rounded; pentagonal area distinctly defined, walls not very sharply raised; fovea shallow; crest low, unbroken; antennæ rather slender, fourth joint a little longer than third; sheath tapering, somewhat obliquely truncate toward tip; venation normal, except that the second recurrent is interstitial with second cubital; stigma broad, rounded on lower margin; claws with minute inner tooth. Color black; small spot beneath bases of antennæ, tips of clypeus, labrum and other mouth parts, outer half of pronotum, tegulæ, legs, and venter of abdomen yellowish; posterior margins of dorsal segments, especially basal ones, pale, together with all of the terminal segment; bases of coxæ, extreme tips of posterior tibiæ, and the posterior tarsi brown; bases of femora slightly infuscated; sheath brown; wings nearly hyaline; veins and stigma light brownish; posterior orbits reddish, strongly infuscated.

Two females. Montana. (Coll. U. S. Nat. Mus.)

16. **Pachynematus ater** McGillivray.

1893. *Messa atra* McGillivray. Can. Ent., xxv, p. 238.

*Female.*—Length 6 mm.; robust, shining, somewhat duller on head from rather dense punctuation; head dilated back of eyes; clypeus very broadly and shallowly notched; ocellar basin distinctly limited, walls

rounded; crest slightly broken; fovea shallow (antennæ wanting); venation normal, except that the second recurrent is interstitial with the second cubital; stigma broad, rounded beneath, somewhat acuminately pointed; claws with minute inner tooth. Color black, including mouth parts, pronotum, and tegulæ; tips of coxæ, trochanters, tips of femora, the anterior tibiæ, and the tarsi pallid, strongly infuscated; veins, including costa and stigma, dark brown; wings nearly hyaline, slightly smoky.

One female, McGillivray's type. Olympia, Wash. Trevor Kincaid, collector. (Coll. Cornell Univ.)

17. **Pachynematus nigropectus** Cresson.

1880. *Nematus nigropectus* Cresson. Trans. Am. Ent. Soc., VIII, p. 6.

*Female.*—Length 8 mm.; moderately robust, glistening; clypeus very gently emarginate; frontal crest and lateral margins of ocellar basin distinctly but not strongly developed, former unbroken; antennal fovea deep, expanding broadly posteriorly; antennæ slender, filiform, joint 4 longest, 5 longer than 3; venation normal; stigma very broad, ovate, somewhat acuminate at apex; sheath narrow, regularly rounded at apex; cerci very narrow, not tapering; inner claw tooth rather large, sharp. Color for the most part luteous; face and upper and posterior orbits pallid; antennæ, vertex and occiput, prosternum, mesonotum, metanotum, broad stripe on dorsal sclerites of abdomen except last, basal half of mesepimera (pectus), and the metepisterna black; tip of sheath and tips of posterior tibiæ, the posterior tarsi, and the anterior tarsi to a less extent, infuscated; veins, including stigma and the costa nearly to base, brown; wings slightly infuscated, almost hyaline.

One female. Nevada. (Coll. Am. Ent. Soc.)

18. **Pachynematus punctulatus** new species.

*Female.*—Length 6.5 mm.; rather robust, head and thorax strongly punctured and somewhat opaque; clypeus, labrum, and pleuræ with rather long and dense yellowish hairs; clypeus shallowly emarginate, lobes broad and rounded; frontal crest and elevated ridges about anterior ocellus prominent, former unbroken; antennal fovea broad, oval; second recurrent interstitial or received in third cubital cell; second cubital cross vein two-thirds as long as third; upper middle cell of hind wings very little exceeding lower; stigma broad, rounded on lower margin, widest at center; sheath broad, truncate; cerci moderately slender, tapering; inner tooth of claw short, obtuse. Head and thorax for most part, basal plates, base of first dorsal segment, sheath, and extreme bases of coxæ brownish black; upper orbits and some marks on dorsum of thorax, including most of scutellum, reddish; triangle below antennæ, tips of clypeus, labrum, pronotum, tegulæ, legs, and abdomen including cerci reddish yellow; extreme tips of posterior tibiæ and the

posterior tarsi slightly infuscated; veins and stigma light brown; costa yellowish.

One female. New Hampshire. (Coll. Am. Ent. Soc.)

19. **Pachynematus abdominalis** new species.

*Female.*—Length, 6.5 mm.; robust, shining; head obscured by dense punctuation; clypeus nearly truncate, scarcely emarginate; ocellar basin indistinctly defined, lateral walls almost obsolete; frontal crest low; fovea oval (antennæ wanting); sheath short, obliquely truncate at apex; stigma regularly rounded beneath, not very broad; venation normal; claw with large, prominent inner tooth near apex. Color black; clypeus whitish; pronotum, tegulæ, and legs reddish yellow; tarsi brown; spot on either side of tergum, extending over segments 2 to 5, reddish yellow; venter of abdomen with yellowish central stripe and more or less yellow toward tip; tips of posterior tibiæ and the posterior tarsi infuscated; wings smoky; veins, including stigma, brown.

One female. Skokomish River, Washington, May 14, 1892, Trevor Kincaid, collector. (Coll. Cornell Univ.)

20. **Pachynematus hoodii** new species.

*Female.*—Length 6.5 mm.; very short, robust; clypeus shallowly and broadly emarginate; frontal crest strongly developed, unbroken; antennal fovea circular; antennæ long, slender, joints 3 and 4 subequal; venation normal; stigma broad, evenly rounded; sheath broad, obliquely truncate at apex; cerci rather robust; claw with minute inner tooth. Color black, shining; labrum, bases of mandibles, palpi, angles of pronotum, tegulæ, venter of abdomen, terminal dorsal segment, and the legs light yellowish; extreme bases of coxæ and the sheath dark brown, almost black; hind tarsi dark brown; wings slightly infuscated, almost hyaline; veins, including stigma and costa, dark brown.

*Male.*—Length 5 mm.; head narrowing back of compound eyes; antennæ very large and long, compressed; procidentia narrow, not strongly produced, rounded at apex. Color as in female, except that the light areas are inclined to yellowish brown, with the venter of the abdomen decidedly brownish.

One female and five males. Mount Hood, Oregon, and Washington. (Coll. Am. Ent. Soc.)

21. **Pachynematus corniger** Norton.

1861. *Nematus corniger* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 159.
1867. *Nematus corniger* Norton. Trans. Am. Ent. Soc., I, p. 199. (Cat., etc., p. 61.)
1878. *Nematus corniger* Provancher. Nat. Can., I, p. 55.
1883. *Nematus corniger* Provancher. Faun. Ent. Can. Hym., p. 184

*Female.*—Length 6 to 7 mm.; moderately robust; clypeus shallowly incised, approaching truncate; vertex finely tuberculate; lateral walls

of ocellar basin very minutely but sharply raised, becoming obsolete posteriorly; frontal crest acutely elevated, angulated, and extending nearly to orbits; antennal fovea broad, extending laterally over bases of antennæ; antennæ long, slender, third joint longer than fourth; intercostal cross nerve nearly twice its length anterior to basal nerve, slightly inclined; second recurrent interstitial, or nearly so, with second transverse cubital; venation otherwise normal; stigma broad, regularly rounded beneath; sheath broad, straight on upper margin, obliquely truncate at apex, bordering hairs minute, scattering; cerci long, scarcely tapering; inner tooth of claw small, remote from apex. Color black, shining; apex of clypeus and other mouth parts, outer third of pronotum, tegulæ, anterior pairs of legs entirely, posterior pair except extreme bases of coxæ and apices of femora and of tibiæ and all of tarsi, venter of abdomen except overlapping sides of last dorsal segment and sheath, very narrow lateral margin of abdomen dorsally, and more or less of apex of all segments yellowish white; femora, particularly hind pairs, more or less inclined to reddish; stigma and veins, except base of costa and slightly at apex, brown.

*Male.*—Length 5 to 5.5 mm.; structurally for the most part as in female; antennæ very broad or strongly compressed, tapering; procidentia rounded at apex, not constricted basally, strongly keeled. Color black; tips of clypeus, mouth parts, angles of pronotum, tegulæ, venter of abdomen, and legs except extreme bases of coxæ and apices of posterior tibiæ and tarsi of same, yellowish ferruginous; venter of abdomen infuscated laterally, and sometimes more or less entirely.

Seven females and three males. Canada, New Jersey, New Hampshire, Pennsylvania, and Illinois (Coll. Am. Ent. Soc.), and Colorado (Coll. U. S. Nat. Mus.).

22. **Pachynematus subalbatus** Norton.

1864. *Nematus subalbatus* Norton. Proc. Ent. Soc. Phila., III, p. 7.
1867. *Nematus subalbatus* Norton. Trans. Am. Ent. Soc., I, p. 199. (Cat., etc., p. 61.)
1878. *Nematus subalbatus* Provancher. Nat. Can., X, p. 54.
1883. *Nematus subalbatus* Provancher. Faun. Ent. Can. Hym., p. 181.

*Female.*—Length 8 mm.; rather elongate; head densely and closely punctured or rugose; clypeus distinctly but not deeply emarginate, lobes rounded; frontal crest very strongly developed, very slightly broken at center, not reaching orbits; sides of ocellar basin distinct, but not strongly elevated; antennal fovea distinct, broadening posteriorly into a suture beneath frontal crest; antennæ longer than head and thorax, moderately robust, tapering, third joint longest; venation normal, except that second recurrent is interstitial, or nearly so, with second transverse cubital; stigma broad, scarcely tapering, until near apex; sheath rather broad, rounded, truncate at apex, straight on upper margin; cerci rather stout, tapering; inner tooth of claw minute,

remote from apex. Color black; tips of clypeus, labrum, angles of pronotum, tegulæ, coxæ except bases, trochanters, bases of femora and tips of anterior pairs, tibiæ except tips of posterior pair, anterior tarsi and venter except laterally at base and apex pallid; palpi fuscous; sheath and cerci black; stigma and veins dark brown, except base of costa, which is lighter.

*Male.*—Length 6.5 mm.; slender; head much narrowed back of compound eyes; structurally for the most part as in female; antennæ large and strongly compressed, tapering; procidentia short, narrow, truncate. Color black; tips of clypeus and mouth parts otherwise, angles of pronotum, venter and legs except extreme bases of coxæ, extreme tips of posterior tibiæ, and all posterior tarsi yellowish ferruginous; venter more or less infuscated laterally and apically (in a specimen from Michigan altogether dark fuscous).

Three females and two males. Massachusetts, Pennsylvania, and Michigan. (Colls. Am. Ent. Soc. and U. S. Nat. Mus.)

The reference of the males to this species is made with considerable doubt on general resemblance and correspondence in habitat.

23. **Pachynematus palliventris** Cresson.

1880. *Nematus palliventris* Cresson. Trans. Am. Ent. Soc., VIII, p. 5.
1894. *Nematus pallidiventralis* Dalla Torre. Cat. Hym., I, p. 248.

*Female.*—Length 6 mm.; moderately robust, shining; head as wide as thorax, quadrangular, vertex tuberculate; clypeus broadly and gently emarginate; frontal crest distinctly elevated, unbroken, extending nearly to orbits; sides of ocellar basin rounded, not strongly raised, indistinct; antennal fovea large, circular, deeply excavated; antennæ longer than head and thorax, rather slender, tapering, joint 3 longest; venation normal; stigma robust, broadest about middle; sheath rather slender, somewhat pointed at tip, dorsal margin nearly straight; cerci minute, filiform; inner tooth of claw minute, obtuse, remote from apex. Color black; labrum, bases of mandibles, angles of pronotum, tegulæ, coxæ except bases, trochanters, tibiæ of anterior pairs of legs and their tarsi, and venter of abdomen yellowish, inclined to pallid, especially on abdomen; femora brown, posterior ones darkest; posterior tibiæ and tarsi decidedly infuscated, especially tips of the tibiæ and the tarsi; more or less of the dorsal segments are narrowly yellow on the posterior margin and the lateral edges are yellow, also base of pygidium, including cerci; sheath black; wings hyaline; veins, including costa and stigma, brown.

One female, Cresson's type. Nevada. (Coll. Am. Ent. Soc.)

24. **Pachynematus tritici** new species.

*Male.*—Length 5.5 mm.; not very robust, head not narrowing back of compound eyes; clypeus rather deeply, somewhat angularly emargi-

nate, lobes broad, rounded; frontal crest and sides of ocellar basin not very strongly elevated, distinct; antennal fovea very shallow, broad; antennæ longer than head and thorax, rather robust and tapering, not compressed, joints 4 and 5 subequal, longer than 3; procidentia longer than broad, squarely truncate at apex; hypopygium strongly produced, rather narrow, and very slightly emarginate at apex; second recurrent interstitial or received at base of third cubital cell, which is scarcely or not twice as long as wide at base; outer veins of discal cells of hind wings interstitial, or nearly so; stigma broad at base, tapering roundly at apex. Color black, shining; triangular spot below antennæ, labrum, upper and posterior orbits, palpi, outer angles of pronotum, tegulæ, apex of abdomen, hypopygium and more or less of venter laterally, apices of coxæ, trochanters, femora except bases, tibiæ except apices, light fulvous; tips of tibiæ, the tarsi, veins, and stigma infuscated; costa yellowish on basal half.

One male, reared from a larva collected on wheat in Indiana by F. M. Webster; adult issued April 22. (Coll. U. S. Nat. Mus.)

25. **Pachynematus apicalis** new species.

*Male.*—Length 7 mm.; very slender, elongate, shining; head not narrowed back of compound eyes; clypeus very shallowly emarginate; walls about ocellar basin distinctly raised, rounded; antennal fovea circular; antennæ very long, slender, tapering, not compressed, fourth joint longest, all joints distinctly nodose at tip; procidentia broad at base, very long, tapering suddenly at tip, which is obtusely rounded; venation normal, except that the second recurrent is interstitial, or nearly so, with the second transverse cubital; outer veins of discal cells of hind wings are also nearly interstitial; stigma broad, widest near base, tapering regularly to apex; inner tooth of claw very minute, remote from apex of claw. Color black; tips of clypeus, labrum, upper and posterior orbits, angles of pronotum, tegulæ, apical half of femora, tibiæ and tarsi, and apical segments of abdomen yellowish ferruginous; stigma and costa and all veins reaching the body basally light yellowish, almost hyaline; other veins brown.

Two males. Montana. (Coll. Am. Ent. Soc.)

26. **Pachynematus infumatus** new species.

*Male.*—Length 8 mm.; robust, head not nearly as wide as thorax, not narrowing back of compound eyes; clypeus very slightly emarginate, almost truncate; vertex rugose; walls about ocellar basin indistinct; antennal fovea extending laterally over bases of antennæ, indistinctly defined; antennæ much longer than head and thorax, tapering, somewhat compressed basally; procidentia very broad, tapering, squarely truncate at apex, not keeled; venation normal; claws with minute inner tooth. Color black; labrum, upper and posterior orbits, outer angles of pronotum, tegulæ, outer two-thirds of femora, tibiæ and tarsi, abdomen

except base of first segment dorsally, yellowish ferruginous; the tarsi and the extreme apices of the posterior tibiæ, pronotum, and tegulæ are distinctly infascated; veins yellowish brown, stigma and costa lighter, but distinctly infuscated; wings distinctly smoky, especially centrally; small spot in center of the median and of the second cubital cell.

One male. Agricultural College, Mich. (Coll. U. S. Nat. Mus.)

27. **Pachynematus thoracicus** new species.

*Male.*—Length 6 mm.; rather robust, head expanding back of compound eyes; antennæ slender, cylindrical, filiform, not compressed; clypeus broadly emarginate, lobes rather pointed; pentagonal ridges sharply raised; antennal fovea divaricating over bases of antennæ; second recurrent and second cubital and outer veins of discal cells of posterior wings interstitial; stigma broad; claws with very minute inner tooth; procidentia very broad, protruding, tapering to roundly truncated apex. Color luteous ferruginous; antennæ, triangular spot beneath, large spot on vertex extending nearly to base of antennæ and posteriorly to occiput, center of lateral lobes of mesonotum, small spot at apex of scutellum, central area of metanotum, including all of basal plates and the abdomen dorsally and ventrally except apex, black; thorax beneath and legs entirely yellowish ferruginous; wings hyaline; veins light brown; costa and stigma yellow, nearly hyaline.

One male. Montana. (Coll. Am. Ent. Soc.)

In characters of head and antennæ and notably also in colorational features this species agrees with remarkable closeness with the female of *affinis*, and departs just as widely in these particulars from the male of that species. There is a possibility, therefore, that it is a hermaphroditic form.

28. **Pachynematus koebelei** new species.

*Male.*—Length 6 mm.; slender, elongate; head not expanding back of compound eyes, or slightly narrowed; clypeus shallowly emarginate; vertex roughened with minute, dense tubercles; ocellar basin with indistinct limiting walls; frontal crest low and scarcely developed; antennal fovea circularly, deeply excavated; antennæ longer than head and thorax, tapering, strongly compressed, joints 3 and 4 subequal; procidentia narrow, protruding nearly twice its width, strongly keeled, rounded at apex; hypopygium very obtusely rounded at apex, short; claws with minute inner tooth remote from apex; venation normal; stigma moderately broad, widest at center. Color black, shining; apical half of femora, tibiæ, and tarsi reddish ferruginous, more or less infuscated, particularly extreme tips of posterior tibiæ and their tarsi; veins dark brown, almost black, including stigma and costa.

One male. Oregon. (Coll. U. S. Nat. Mus.)

29. **Pachynematus occidentalis** new species.

*Male.*—Length 6 mm.; rather slender, elongate; head slightly narrowing back of compound eyes; clypeus broadly and shallowly emarginate; antennæ short, stout, strongly compressed; crest rounded, unbroken; fovea deep, oblong, somewhat constricted medially; procidentia broad, rounded; venation normal, except that the third cubital cell is quite elongate, the sides but slightly divaricating; stigma robust; antennæ very broad, flattened, and not much longer than head and thorax. Color black, shining; extreme apex of clypeus, labrum, part of angles of pronotum, tegulæ, and legs light reddish brown; coxæ, except extreme tips, black; tips of posterior tarsi brownish; wings slightly infuscated; veins and stigma dark brown.

Two males. Washington. (Coll. Am. Ent. Soc.)

30. **Pachynematus carolinensis** new species.

*Male.*—Length 5 mm.; head much narrowed back of compound eyes; clypeus broadly, circularly emarginate, lobes triangular; ocellar basin with distinctly defined limiting ridges; frontal crest strong, unbroken; fovea oval, shallow; antennæ elongate, tapering, slightly compressed basally; procidentia narrow, produced, truncate at apex; third cubital cell very short, quadrate; outer cross veins of discal cells of hind wings interstitial; stigma regularly rounded on lower margin. Color black; orbits, face beneath antennæ, mouth parts, pronotum, tegulæ, large spot on upper half of mesepimera, venter, and legs yellowish resinous; posterior tarsi slightly infuscated; wings hyaline; veins, including stigma, brown.

Three males. North Carolina. (Coll. Am. Ent. Soc.)

31. **Pachynematus wrangeli** new species.

*Male.*—Length 6 mm.; rather slender; head distinctly narrowed back of compound eyes; clypeus rather deeply incised, lobes medium, rounded at apices; vertex shining; walls about ocellar basin distinctly but not strongly raised, rounded; frontal crest slightly broken; antennal fovea very distinct, clearly defined, circular; antennæ long, tapering, slightly compressed basally, fourth joint distinctly longer than third; upper discal cell of hind wings very slightly exceeding lower; procidentia scarcely projecting, nearly squarely truncate at apex, slightly constricted basally; hypopygium distinctly notched at tip; inner tooth of claw large, remote from apex. Color black, shining; triangular spot beneath antennæ, lower orbits, mouth parts, angles of pronotum, tegulæ, coxæ, trochanters, all of anterior legs, more or less of underside of posterior femora, and the venter yellowish white, more or less infuscated, giving a grayish aspect to the lighter-colored parts; veins, stigma, and costa to base dark brown.

Three males. Fort Wrangel, Alaska. Mr. H. F. Wickham, collector. (Coll. U. S. Nat. Mus.)

32. **Pachynematus minutus** new species.

*Male.*—Length 5 mm.; slender, head not much narrowed back of compound eyes; clypeus broadly emarginate, lobes small, triangular; ocellar basin with low but distinct lateral walls; crest low, slighty broken; fovea oval; antennæ rather long, slender, slightly compressed basally, joint 4 slightly longer than 3; venation normal; stigma very narrow, acuminate; claw with minute inner tooth not very remote from tip. Color black; tips of clypeus, labrum, tegulæ, last ventral segment of abdomen, and legs for the most part reddish yellow; coxæ and bases of femora black; wings slightly infuscated; veins brown; stigma scarcely paler.

Three males. Olympia, Wash., May 5–16, 1894–95. Trevor Kincaid, collector. (Coll. Cornell Univ.)

33. **Pachynematus nevadensis** new species.

*Male.*—Length 6 mm.; slender, elongate; head somewhat narrowed back of compound eyes; clypeus shallowly, broadly emarginate, lobes narrow, rather sharp pointed; ocellar basin distinctly defined, walls rounded; antennal fovea oval, not very distinctly defined; antennæ longer than head and thorax, strongly compressed, tapering, joints 3 to 5 subequal; venation normal; stigma moderately robust, widest at center; procidentia small, narrow, protruding, rounded at apex; claws with minute inner tooth not very remote from apex. Color black, shining; more or less of apex of clypeus, labrum and mouth parts, extreme angles of pronotum, tegulæ, legs except coxæ, venter, and more or less of apex of dorsal sclerites reddish ferruginous, somewhat infuscated, especially on bases of femora, trochanters, posterior tibiæ and their tarsi; posterior orbits narrowly and obscurely reddish; veins and stigma dark brown.

Five males. Nevada. (Coll. Am. Ent. Soc.)

## XIV. Genus **MICRONEMATUS** Konow.

*Micronematus* Konow. Deutsche Entom. Zeitsch., XXXIV, 1890, p. 239.

Body small, ovate; clypeus emarginate at apex; claws with subapical tooth; pentagonal area obsolete; antennæ short, filiform; costal vein greatly dilated at apex, first transverse cubital nerve present; eighth (seventh ?) dorsal segment of male with short carina; sheaths of female simple.—Konow.

This genus seems to be of doubtful value and at least has no American representatives. The only one of the European species which I have had the opportunity of examining, *Micronematus pullus* Först., seems to belong to my new genus *Gymnonychus*.

## XV. Genus LYGÆONEMATUS Konow.

*Lygæonematus* Konow. Deutsche Entomologische Zeitschrift, 1890, II, p. 238.

Body elongate-ovate; clypeus truncate at apex; pentagonal area more or less distinct; claws with short, subapical tooth; last dorsal segment of the male carinate, carina subproduced at apex; sheath of female simple.—Konow.

As already indicated under the preceding genus, the characters given in the descriptions of the genera *Pachynematus* and *Lygæonematus* by Konow are insufficient to satisfactorily separate the species. For this reason most of the American species have been referred to the first-named genus. I have, however, placed two species in the genus *Lygæonematus* which seem most typical in the characters supposedly peculiar to it. One of them, the European *L. erichsonii* Hartig, is also so referred by Konow. Almost all of the third group of species referred to *Pachynematus* could with equal propriety be placed in *Lygæonematus*. If it should seem later advisable to separate the material now referred to *Pachynematus* it could be best done, at least so far as the American species are concerned, on the basis of the characters indicated in the table of species separating groups 2 and 3, rather than on characters proposed by Konow. The two species referred to *Lygæonematus* may be roughly separated, as follows:

Abdomen black ..... 1. *winnipeg* Norton.
Abdomen, with four basal segments, orange yellow.. ..... 2. *erichsonii* Hartig.

### 1. Lygæonematus winnipeg Norton.

1867. *Nematus winnipeg* Norton. Trans. Am. Ent. Soc., I, p. 198. (Cat., etc., p. 60.)

*Female.*—Length 8 mm.; very robust; clypeus truncate; lateral ridges of ocellar basin low, indistinct, frontal crest wanting; fovea small, shallow (antennæ wanting); venation normal; stigma elongate, circular on lower margin; sheath broad, rounded at apex; cerci slender, tapering. Color black; head and thorax opaque; abdomen shining; clypeus in part, labrum, angles of pronotum, tegulæ, apex of abdomen dorsally and ventrally, apices of coxæ, trochanters, and legs for the most part yellowish ferruginous; anterior femora brown on lower margin, posterior femora with the brown extending over the sides, especially apically; extreme apices of posterior tibiæ and tarsi somewhat infuscated; veins, including costa nearly to base and stigma, brown.

One female, Cresson's type; a much-damaged specimen. Hudson Bay territory (Lake Winnipeg?). (Coll. Am. Ent. Soc.)

The males referred to in the original description have been lost.

### 2. Lygæonematus erichsonii Hartig.

1837.[1] *Nematus erichsonii* Hartig. Fam. Blatt. Holzwesp., p. 187.
1880. *Nematus notabilis* Cresson. Trans. Am. Ent. Soc., VIII, p. 7.

[1] Later European references are omitted.

1881. *Nematus erichsonii* Hagen. Can. Ent., XIII, p. 37.
1883. *Nematus erichsonii* Packard. Rept. U. S. Ent., pp. 138–146.
1883. *Nematus erichsonii* Packard. Bull. 3, Div. Ent., U. S. Dept. Agr., pp. 29, 30.
1883. *Nematus erichsonii* Fyles. Can. Ent., XV, p. 205.
1884. *Nematus erichsonii* Fletcher. Can. Ent., XVI, pp. 215, 216.
1884. *Nematus erichsonii* Packard. Am. Nat., XVIII, pp. 293–296.
1884. *Nematus erichsonii* Packard. Rept. U. S. Dept. Agric., p. 377.
1885. *Nematus erichsonii* Provancher. Add. Faun. Can. Hym., p. 5.
1885. *Nematus erichsonii* Provancher. Nat. Can., XV, pp. 38, 45–50.
1885. *Nematus erichsonii* Fletcher. Rept. Dept. Agric., Ottawa, Can., p. 28.
1886. *Nematus erichsonii* Harrington. Can. Ent., XVIII, p. 39.
1886. *Nematus erichsonii* Provancher. Nat. Can., XVI, p. 32.
1887. *Nematus erichsonii* Fletcher. Rept. Dept. Agric., Ottawa, Can., p. 35.
1888. *Nematus erichsonii* Lintner. Fifth Rept. Ins. N. Y., pp. 164–173.
1889. *Nematus erichsonii* Fletcher. Can. Ent., XXI, p. 152.
1890. *Nematus erichsonii* Packard. Fifth Rept. U. S. Ent. Comm., p. 879.
1890. *Lygaonematus erichsonii* Konow. Deutsch. Entom. Zeit., XXXIV, p. 217.

*Female.*—Length 11 mm.; exp. al. 22 mm.; large, moderately robust; head and thorax finely punctured, entire body shining; clypeus scarcely emarginate, almost truncate; frontal and lateral ridges of ocellar basin rounded, indistinct; vertex nearly smooth; antennal fovea long, shallow, deepest at apex; antennæ about as long as head and thorax, rather robust, tapering, joints 3 and 4 subequal; sheath broad, rounded, truncate at tip; cerci flattened, somewhat tapering; intercostal cross vein hyaline, indistinct, but anterior to basal and nearly at right angles to costa; first transverse cubital indistinct or wanting; stigma moderately broad, not acuminate; claw with minute inner tooth near apex. Color black; tip of clypeus, palpi, basal two-thirds of tibiæ, apices of trochanters, and extreme angles of pronotum whitish; femora, tips of anterior tibiæ and their tarsi, first four segments of abdomen above and beneath except base of first segment, orange rufous; extreme tips of middle femora above and hind femora a little more broadly, tips of hind tibiæ and their tarsi, black; lower surface of antennæ rufous; veins black, except costa, which is fulvous, and anal vein, which is whitish; wings somewhat infuscated; dusky spot in second cubital cell large, prominent.

*Male.*—Length 8.5 to 9 mm.; slender, elongate, abdomen not wider than thorax; in general, structurally as in female; procidentia strongly keeled, somewhat constricted basally, short, not projecting beyond the seventh dorsal segment; last ventral segment slightly emarginate at apex. Color black; antennæ, three basal segments of the abdomen dorsally except more or less of base of first segment, base of the fourth segment, all of venter of abdomen, and the legs except bases of coxæ reddish yellow; tips of the hind tibiæ and the hind tarsi brownish; face below antennæ, more or less of lower orbits, pronotum, and tegulæ whitish; wings as in female.

Male described from one and female from many reared specimens from Canada. (Coll. U. S. Nat. Mus.) Other females examined repre-

sent Labrador and Massachusetts—the latter Cresson's types of *notabilis*. (Coll. Am. Ent. Soc.)

## XVI. Genus PRISTIPHORA Latreille.

*Pristiphora* Latreille, Fam. Nat. du Regne Animal, Paris, 1825.
*Pristiphora* Konow, Deutsche Ent. Zeits., XXXIV, 1890, p. 238.

Body short, ovate; clypeus truncate at apex; pentagonal area obsolete; claws either with subapical tooth or bifid; first transverse cubital of anterior wings often wanting or hyaline; eighth (seventh?) dorsal segment of the male carinate, carina not prominent at apex; sheath of female with rather dense scopa at tip.—Konow.

The species of this genus form a fairly well defined group, but are often referable rather from the sum of the characters than from any particular feature. The absence of the first cubital nerve is by no means constant, even in the same species, although usually a good generic character and to be relied upon. The claws are sometimes very evenly notched at the tips, but not deeply so. When this is the case, however, the smooth vertex, which is a very constant characteristic of the genus, taken in connection with the other characters, will usually determine the true affinities. Very little is known by actual rearings of the habits of the species, but in this particular they probably present no striking peculiarities. A number of them feed on willow and *P. idiota* Norton is an important enemy of the cranberry.

TABLE OF SPECIES.

*Females*

I. Head, thorax and abdomen black.
  Wings strongly infuscated ..... 1. *nigra* n. sp.
  Wings not or very slightly infuscated.
    Tegulæ black.
      Head small, narrow, not much more than one-half width of thorax.
        Posterior tibiæ and tarsi unicolorous, pale .. 2. *labradoris* Norton.
        Posterior tibiæ pale, tips black; tarsi black .. 3. *sycophanta* Walsh.
      Head broad, much more than one-half width of thorax.
        Posterior tibiæ strongly infuscated, nearly black. 4. *lata* Cresson.
        Posterior tibiæ pale except tips, which with tarsi are brown.
          5. *siskiyouensis* n. sp.
    Tegulæ pale.
      Labrum black; extreme tips only of hind tibiæ black.
        Stigma brown ..... 6. *murtfeldtiæ* n. sp.
        Stigma luteous, pale at base ..... 7. *relativa* Norton.
      Labrum, together with tip of clypeus, pale; apical half of hind tibiæ black ..... 8. *banksi* n. sp.

II. Head black; thorax and abdomen, or abdomen only, distinctly marked or banded with yellow.
  1. Pronotum black or only the extreme angle yellow; abdomen, with segments 2 to 5, yellow, sometimes interrupted centrally above ..... 9. *idiota* Norton.
  2. Pronotum, with outer one-half, yellow; femora yellow; segments 1 to 4 reddish yellow, infuscated ..... 10. *dyari* n. sp.

3. Pronotum as above; femora brown at tips or bases; segments 1 to 6 yellow. Stigma three times as long as wide; costa not or scarcely paler than stigma ..... 11. *jocularis* Cresson.
Stigma twice as long as wide; costa much paler than stigma. 12. *hoodi* n. sp.

4. Pronotum yellow; thorax otherwise black; abdomen black, except lateral third of segments after the first and venter ..... 13. *koebelei* n. sp.

5. Pronotum yellow; thorax and abdomen reddish yellow, marked with black. 14. *bivittata* Norton.

*Males.*

Femora altogether black, or at least hind pair.
Pronotum and tegulæ black.
Posterior tibiæ pale, strongly infuscated at tips ..... 5. *siskiyouensis* n. sp.
Posterior tibiæ strongly infuscated, nearly black ..... 4. *lata* Cresson.
Pronotum black; tegulæ pale; apical half of hind tibiæ black . 8. *banksi* n. sp.
Femora black basally, paling apically; pronotum and clypeus black; labrum infuscated ..... 9. *idiota* Norton.
Femora pale, except sometimes tips of posterior pair.
Abdomen, with basal segments, yellow ..... 11. *jocularis* Cresson.
Abdomen altogether black dorsally.
Venter pale ..... 15. *carolinensis* n. sp.
Venter black.
Pronotum and legs orange yellow ..... 16. *luteola* Norton.
Pronotum and legs reddish yellow; genitalia strongly infuscated. 17. *occidentalis* n. sp.
Pronotum black, except extreme angles; legs and genitalia yellow. 18. *coloradensis* n. sp.

INDEX TO SPECIES OF PRISTIPHORA.



**1. Pristiphora nigra** new species.

*Female.*—Length 5.5 mm.; surface somewhat shining, head rather densely and finely granulate; clypeus scarcely emarginate, almost truncate; elevations, frontal and ocellar, almost obsolete; antennal fovea broad, circular, shallow; intercostal cross vein about its own length anterior to basal and strongly inclined; first transverse cubital wanting, venation otherwise normal; stigma not greatly broadened at base; apex of costa considerably enlarged; scopa of sheath rather long and dense; cerci short tapering; inner tooth of claw short, obtuse. Color black; tibiæ, except apices of posterior pair and bases of tarsi, lighter, inclined to whitish; wings strongly infuscated; veins, including stigma and costa, dark brown.

One female, Easton, Wash. (Coll. U. S. Nat. Mus.)

**2. Pristiphora labradoris** Norton.

1867. *Nematus labradoris* Norton. Trans. Am. Ent. Soc., I, p. 196. (Cat., etc., p. 58.)
1878. *Nematus labradoris* Provancher. Nat. Can., X, p. 53.
1883. *Nematus labradoris* Provancher. Faun. Ent. Can. Hym., p. 185.

*Female.*—Length 5 mm.; short, robust; head and thorax densely granulate-punctate, with minute hoary pubescence; abdomen smooth, shining; head narrow, not more than half as wide as thorax, strongly trilobed when viewed from above; clypeus broadly but very shallowly emarginate, almost truncate; frontal crest and sides of ocellar basin indistinct, almost wanting; fovea indistinct; antennæ short, slender, scarcely tapering, third to fifth joints subequal; intercostal cross vein nearly twice its length anterior to basal vein, inclined; third cubital cell not much more than twice as long as wide at base, venation otherwise normal; stigma tapering regularly to somewhat acuminate apex from rather broadly ovate base; sheath tapering on both edges to rounded extremity, and with very distinct and heavy scopa; cerci strongly tapering; inner tooth of claw minute. Color black; margin of labrum, bases of mandibles and palpi, tibiæ and tarsi, apical half of anterior pair and extreme tips of two posterior pairs of femora, fulvous, more or less infuscated; veins light yellowish brown, including stigma and costa; wings hyaline, or but slightly infuscated.

One female, Norton's type (?). Labrador. (Coll. Am. Ent. Soc.)

**3. Pristiphora sycophanta** Walsh.

1866. *Pristiphora sycophanta* Walsh. Proc. Ent. Soc. Phil., VI, p. 263. ♂
1867. *Pristiphora sycophanta* Norton. Trans. Am. Ent. Soc., I, p. 76. (Cat., etc., p. 46). ♂
1867. *Pristiphora tibialis* Norton. Trans. Am. Ent. Soc., I, p. 76. (Cat., etc., p. 46).
1878. *Pristiphora tibialis* Provancher. Nat. Can., X, p. 50.
1881. *Pristiphora sycophanta* Packard. Bull. 7, U. S. Ent. Comm., p. 141.
1882. *Nematus sycophanta* Kirby. List Hym. Brit. Mus., I, p. 140.
1882. *Nematus trivialis* Kirby. List Hym. Brit. Mus., I, p. 140.
1883. *Pristiphora tibialis* Provancher. Faun. Ent. Can. Hym., p. 182.
1886. *Pristiphora sycophanta* Provancher. Add. Faun. Can. Hym., p. 22.
1890. *Pristiphora sycophanta* Packard. Fifth Rept. U. S. Ent. Comm., p. 598.
1894. *Nematus tibialis* Dalla Torre. Cat. Hym., I, p. 266.
1895. *Pristiphora sycophanta* Marlatt. Proc. Ent. Soc., Wash., III, p. 267.
1895. *Pristiphora tibialis* Dyar. Trans. Am. Ent. Soc., XXII, p. 301 (larva).

*Female.*—Length 5 mm.; moderately robust; head small, narrow, not much more than half the width of thorax; clypeus nearly truncate; vertex smooth, ridges rounded, subobsolete; fovea very minute, circular; antennæ slender, slightly tapering, third joint much longer than fourth; claw with very minute inner tooth; venation normal, except that the second cubital is wanting. Color black, shining, including mouth parts and tegulæ; anterior and middle tibiæ and tarsi yellowish; posterior tibiæ, except apical third, whitish; wings nearly hyaline; veins and stigma brown.

One female. Nevada. (Coll. U. S. Nat. Mus.) A specimen from Ithaca, N. Y., has also been referred, doubtfully, to this species.

Mr. H. G. Dyar reared this insect from green larvæ found on white birch (*Betula papyrifera*) at Keene Valley, N. Y., and also on willow and yellow birch at Jefferson, N. Y.

4. **Pristiphora lata** Cresson.

1880. *Nematus latus* Cresson. Trans. Am. Ent. Soc., VIII. p. 4.

*Female.*—Length 5.5 mm.; short, very robust; head nearly as wide as thorax, not noticeably trilobed, finely granulate; body generally clothed with fine hoary pile; clypeus truncate; frontal crest and sides of ocellar basin entirely wanting; antennal fovea very minute, shallow, circular; antennæ short, not longer than head and thorax, somewhat compressed, tapering, third and fourth joints subequal; intercostal cross nerve nearly interstitial with basal, inclined; third cubital cell not more than twice as long as wide at base; venation otherwise normal; sheath not very robust, tapering on both edges, with distinct scopa; cerci minute, not tapering; inner tooth of claw very minute. Color black; head and thorax opaque, abdomen shining; clypeus, apical two-thirds of first pair of femora and their tibiæ, and tarsi fulvous, inclined to fuscous; posterior tibiæ and tarsi fuscous; wings hyaline; veins dark brown; extreme angle of pronotum fulvous.

*Male.*—Characters in general as in the female. Color the same, except that the female sometimes has the extreme tip of the pronotum yellow; antennæ robust, short, strongly compressed; first cubital cross vein hyaline. Easily distinguished from all other males of the genus by the black pronotum and tegulæ, and black or strongly infuscated hind tibiæ.

Two females and one male. Nevada. (Colls. Am. Ent. Soc. and U. S. Nat. Mus.)

This species is very closely allied to *labradoris*, but differs particularly in the much wider head relative to the thorax, and also in minor details.

5. **Pristiphora siskiyouensis** new species.

*Female.*—Length 5 mm.; rather robust; head large, nearly as wide as thorax; vertex smooth, shining, with no indications of ridges; clypeus nearly truncate; antennal fovea wanting, or nearly so; antennæ slender, slightly tapering, third joint much longer than fourth; claw with minute inner tooth; venation normal, except that second cubital is wanting. Color black, shining, including mouth parts and tegulæ; anterior tibiæ and tarsi pallid, the tarsi slightly infuscated; posterior tibiæ white, except tips, which, with posterior tarsi, are brownish, almost black; wings hyaline; veins and stigma brown.

*Male.*—Agrees with female in colorational characters; antennæ stouter and somewhat compressed, distinctly tapering; easily distinguished by the black pronotum and tegulæ from other species, except

the closely allied *lata*, from which it may be separated by the characters of the hind tibiæ.

Two males and one female. Siskiyou County, Cal. April. Mr. Albert Koebele, collector. (Coll. U. S. Nat. Mus.)

This species is closely related in general appearance to *sycophanta* Walsh, but differs distinctly in shape and size of head relative to thorax.

6. **Pristiphora murtfeldtiæ** new species.

*Female.*—Length 6 mm.; not very robust, shining; head and thorax very finely punctured; clypeus truncate; antennal fovea shallow, indistinct, merging into the smooth ocellar region; antennæ moderately stout, joint 3 longest; intercostal vein more than its length anterior to basal; third cubital cell not more than twice as long as wide at base; inner tooth of claw obtuse, rather large. Color black; tegulæ, trochanters, tips of anterior femora, all tibiæ except tips of posterior pair, anterior pairs of tarsi and bases of posterior pair, fulvous.

One female, reared by Miss Mary Murtfeldt, at Kirkwood, Mo., from a smooth, greenish slug with black head, found feeding on black willow. Adult issued April 10, 1887. (Coll. U. S. Nat. Mus.)

7. **Pristiphora relativa** Norton.

1867. *Pristiphora relativus* Norton. Trans. Am. Ent. Soc., 1, p. 77. (Cat. etc., p. 47.)

1882. *Nematus relativus* Kirby. List Hym. Brit. Mus., 1, p. 140.

*Female.*—Length 0.18, br. wings 0.38 inch. Color shining black. Antennæ as in *P. tibialis*. Head coriaceous, without sensible depressions about the ocelli; edge of nasus incurved. Tegulæ and legs whitish; coxæ and a wide band on the femora black; tips of posterior tibiæ and their tarsi, except basal joint, fuscous. Wings hyaline, stigma and costa luteous, the latter pale at base; second submarginal cell contracted at junction with third cell.

Great Slave Lake, H. B. T. R. Kennicott, collector.

This is not as stout as the preceding species (*tibialis*), but resembles it much.

I have not examined the type of this species, and merely reproduce the original description.

8. **Pristiphora banksi** new species.

*Female.*—Length 5 mm.; rather robust; head nearly as wide as thorax; clypeus rounded in front, not at all emarginate; vertex without ridges around ocellar basin, deeply and coarsely punctured; antennæ tapering, third joint longest; claws with minute inner tooth; venation normal, except that second recurrent is wanting. Color black, shining; apex of clypeus, labrum, tegulæ, apices of coxæ, trochanters, and tibiæ for the most part pallid; anterior tarsi slightly infuscated; apical half of posterior tibiæ and the posterior tarsi black.

*Male.*—Agrees for the most part in structural and colorational char-

acters with the female. Antennæ are stouter and somewhat compressed. Differs from the female in that the pronotum is entirely black.

One male and one female. Sea Cliff, Long Island, and Ithaca, N. Y. Mr. Nathan Banks, collector. (Coll. U. S. Nat. Mus.)

9. **Pristiphora idiota** Norton.

1867. *Pristiphora idiota* Norton. Trans. Am. Ent. Soc., I, p. 77.
1867. *Pristiphora identidem* Norton. Trans. Am. Ent. Soc., I, p. 77. (Cat., etc., p. 47.)
1869. *Pristiphora identidem* Glover. Rept. U. S. Dept. Agr., p. 207.
1870. *Pristiphora identidem* Packard. Guide to Study of Insects, p. 217.
1872. *Pristiphora identidem* Norton. Trans. Am. Ent. Soc., IV, p. 78.
1877. *Pristiphora identidem* Glover. Rept. U. S. Dept. Agric., p. 92.
1878. *Pristiphora idiota* Provancher. Nat. Can., X, p. 50.
1881. *Pristiphora identidem* Thomas. 10th Rept. State Ent. Ill., 1880, p. 69.
1882. *Nematus idiotus* Kirby. List Hym. Brit. Mus., I, p. 140.
1883. *Pristiphora idiota* Provancher. Faun. Ent. Can. Hym., p. 182.
1883. *Pristiphora identidem* Saunders. Ins. Inj. to Fruits, p. 373.

*Female.*—Length 5 mm.; moderately robust; head with coarse, deep puncturing; ridges on either side of anterior ocellus rounded, nearly obsolete; clypeus nearly truncate; antennæ slender, third joint very much longer than fourth, fourth and fifth subequal; sheath rather slender, rounded at tip, with dense bordering fringe of hairs; claws with minute inner tooth; venation normal, except that the first cubital cross vein is wanting. Color black, shining; clypeus and palpi, tegulæ, and central area of abdomen, latter more or less interrupted dorsally, yellow; legs yellow; femora usually brown basally and apically, especially on upper and lower margins, or brown with sides reddish yellow; tips of posterior tibiæ and tarsi brown; wings hyaline; veins brown.

*Male.*—Agrees with female in structural and colorational characters, except that the abdomen is entirely black. Antennæ are considerably stouter than those of the female, cylindrical, not at all compressed.

Many specimens of both sexes. New Hampshire. (Colls. Am. Ent. Soc. and U. S. Nat. Mus.)

10. **Pristiphora dyari** new species.

*Female.*—Length 5.5 mm.; very robust; head with coarse, dense puncturing; frontal ridge slightly elevated; fovea shallow; clypeus nearly squarely truncate; antennæ tapering, third joint longest; sheath not very broad, rounded at apex, with dense bordering hairs; claws minutely cleft, sharp, inner tooth near apex; venation normal, except that first cubital is wanting. Color black, shining; clypeus, outer half of pronotum, tegulæ, segments 1 to 4 of abdomen, and legs reddish yellow; apical third of posterior tibiæ and their tarsi black; wings hyaline; veins dark brown.

One female. Keene Valley, N. Y., June 21, 1894. (Coll. Dyar.)

11. **Pristiphora jocularis** Cresson.

1880. *Pristiphora jocularis* Cresson. Trans. Am. Ent. Soc., VIII, p. 3.
1882. *Nematus jocularis* Kirby. List Hym. Brit. Mus., I, p. 141.

*Female.*—Length 7 mm.; robust; head coarsely punctured; vertex with ridges about anterior ocellus present, but rounded and indistinct; antennal fovea circular, shallow; clypeus squarely truncate, and with labrum clothed with rather dense and long, whitish hairs; sheath stout, with rather dense hairs; first cubital wanting; stigma three times as long as wide; claw tooth small and near apex, approaching bifid. Color black, shining, subsericeous; labrum and tip of clypeus pallid; outer half of angles of pronotum, tegulæ, abdomen except two apical segments, and legs for most part yellow; extreme bases of coxæ black; tips of posterior femora, tips of posterior tibiæ and their tarsi, brownish black; wings nearly hyaline; veins, including stigma and costa, dark brown.

*Male.*—Length 5 mm.; structurally as in female, except that the ridges of vertex are practically obsolete; fovea very shallow, almost wanting; antennæ compressed, tapering; procidentia short, keeled, constricted basally. Color as in female, except that the abdomen is black above, banded with yellow on second and third segments; posterior femora brown only at extreme tips above.

Cresson's type specimens, one male and one female. Morrison, collector. Nevada. (Coll. Am. Ent. Soc.)

12. **Pristiphora hoodi** new species.

*Female.*—Length 7 mm.; robust; head coarsely punctured; vertex, with ridges about anterior ocellus, rounded, subobsolete; antennal fovea circular, distinctly excavated anteriorly; clypeus squarely truncate; sheath broad, thickly clothed with hairs toward apex; claws with minute inner tooth near apex; first cubital wanting; stigma about twice as long as wide. Color black, shining, subsericeous; tip of clypeus and labrum whitish; outer half of angles of pronotum, tegulæ, abdomen except three terminal segments, and legs for the most part reddish yellow; outer half of posterior femora brown, anterior femora slightly infuscated basally; tips of posterior tibiæ and their tarsi infuscated; basal half of coxæ black; basal plates tinged with rufous; wings hyaline; veins brown, costa somewhat paler; first cubital cross vein hyaline.

One female. Mount Hood, Oreg. (Coll. Am. Ent. Soc.)

This species comes very close to Cresson's *jocularis*, but differs, perhaps, sufficiently to warrant a new species.

13. **Pristiphora koebelei** new species.

*Female.*—Length 6 mm.; robust; head coarsely and rugosely roughened with little tubercles; lateral ridges about anterior ocellus obsolete;

frontal crest moderately developed, obtuse; fovea shallow, clypeus truncate; antennæ moderately stout, scarcely tapering until near tip, third joint not, or scarcely, longer than fourth; venation normal, except that the first cubital is hyaline; sheath with dense fringe of hairs; claws, with rather large inner tooth, approaching bifid. Color black, shining; apex of clypeus, labrum, pronotum, tegulæ, abdomen, and legs for the most part reddish yellow; basal segment of abdomen, narrow line down center of dorsum of following segments, more or less interrupted at sutures, black; posterior tarsi and extreme tips of posterior tibiæ black; bases of all coxæ black; band on mesonotum, just above scutellum, rufous; wings hyaline, or nearly so; veins and stigma dark brown; spot in second cubital cell large and prominent.

Four females. Washington. (Colls. U. S. Nat. Mus. and Am. Ent. Soc.)

14. **Pristiphora bivittata** Norton.

1861. *Nematus bivittatus* Norton. Proc. Boston Soc. Nat. Hist., VIII., p. 158.
1867. *Nematus bivittatus* Norton. Trans. Am. Ent. Soc., I, p. 219. (Cat., etc., p. 31.)
1878. *Nematus bivittatus* Provancher. Nat. Can., X, p. 56.
1883. *Nematus bivittatus* Provancher. Faun. Ent. Can. Hym., p. 188.

*Female.*—Length 6.5 mm.; robust, shining; head densely and finely tuberculate-granulate, opaque, clothed with sericeous hairs; clypeus nearly squarely truncate; ocellar and frontal ridges almost wanting; antennal fovea shallow, tapering anteriorly, indistinct; antennæ very robust, last four joints tapering somewhat suddenly, third to fifth joints subequal, more robust; sheath not very broad, obtusely pointed, scopa not very long but dense; cerci short, tapering; claws with rather long inner tooth; intercostal anterior to basal and almost at right angles with costa; wings otherwise normal; first transverse cubital wanting; stigma ovate at base, tapering regularly to apex. Color in general reddish orange; clypeus, labrum, bases of mandibles, inclined to pallid; head above clypeus and antennæ, stripe on lateral lobes of mesonotum and sometimes on anterior lobe, scutellum, metanotum, lateral dorsal angle of first segment, narrow stripe along center of dorsum, terminating on next to last segment, lower third of mesepmera, and sheath black or dark brown; tips of hind tibiæ and the hind tarsi strongly infuscated; veins, including stigma and costa nearly to base, dark brown; first transverse cubital hyaline, indistinct.

Four females. Canada, Massachusetts, and Illinois. (Coll. Am. Ent. Soc.)

15. **Pristiphora carolinensis** new species.

*Male.*—Length 5 mm.: rather slender; vertex without prominent ridges about anterior ocellus, somewhat roughened, with minute tubercles; frontal crest obsolete, fovea very shallow or nearly wanting; clypeus nearly truncate or very broadly and shallowly emarginate;

antennæ slender, elongate, joints slightly enlarged at tips; second cubital hyaline; outer veins of discal cells of hind wings interstitial; procidentia broad, strongly keeled; claws with minute inner tooth remote from apex. Color black, shining; clypeus, mouth parts, pronotum, tegulæ, legs, central area of abdomen ventrally, pale yellowish; apical half of posterior tibiæ and their tarsi brownish black; wings hyaline; veins light brown.

Three males, two without locality labels and one collected in North Carolina. (Coll. Am. Ent. Soc.)

16. **Pristiphora luteola** Norton.

1867. *Nematus luteolus* Norton. Trans. Am. Ent. Soc., I, p. 200. (Cat., etc., p. 62.)
1878. *Nematus luteolus* Provancher. Nat. Can., X, p. 55.
1883. *Nematus luteolus* Provancher. Faun. Ent. Can. Hym., p. 185.
1893. *Nematus luteolus* McGillivray. Can. Ent., XXV, p. 238.

*Male.*—Length 6 mm.; rather slender, elongate, shining; head and thorax strongly punctured; clypeus squarely truncate; ocellar and frontal ridges subobsolete; antennal fovea very shallow, broad; antennæ very robust, flattened, tapering, longer than head and thorax, joints 3 to 5 subequal; venation normal, except that intercostal vein is nearly at right angles to costa and the first transverse cubital is subobsolete or hyaline; upper discoidal cell of hind wings sometimes extending more than ⅛ its length beyond the lower cell; procidentia very broad, slightly excavated at tip, not projecting; hypopygium distinctly notched at tip; claws with rather large, prominent inner tooth. Color black; clypeus, labrum, bases of mandibles, palpi, legs for the most part, pronotum, and tegulæ yellowish ferruginous; tips of posterior tibiæ and tarsi fuscous; veins, including costa and stigma, except base of latter, brown.

Two males. Illinois and Massachusetts. (Coll. Am. Ent. Soc.)

17. **Pristiphora occidentalis** new species.

*Male.*—Length 5 mm.; not very robust; head roughened; lateral walls about anterior ocellus entirely wanting; crest present, rounded; fovea shallow; clypeus truncate; antennæ tapering, compressed basally; procidentia broad, not projecting beyond seventh segment; claws with minute inner tooth near apex; second cubital cross vein present; third cubital cell quadrate. Color black, shining; clypeus yellowish; pronotum, tegulæ, and legs reddish yellow; posterior tarsi infuscated; wings slightly smoky; veins and stigma dark brown; costa yellowish; genitalia strongly infuscated, nearly black.

Three males. Oregon and Washington. (Coll. U. S. Nat. Mus.)

18. **Pristiphora coloradensis** new species.

*Male.*—Length 5 mm.; not very robust; head roughened with minute tubercles; ridges about anterior ocellus wanting; crest indistinctly

raised; fovea shallow; clypeus truncate; antennæ stout, tapering, fourth joint longer than third; first transverse cubital wanting; claws with minute inner tooth. Color black, shining; distinct pubescence on pleura; apex of clypeus, labrum, extreme angles of pronotum, tegulæ, and legs for the most part yellow; coxæ black basally; posterior tibiæ at tips and their tarsi infuscated; wings hyaline; veins light brown; genitalia yellow.

One male. Colorado. (Coll. Am. Ent. Soc.)

## XVII. Genus GYMNONYCHUS nov. gen.

[From γυμνός, naked, and ὄνυξ, claw.]

Body short, ovate; antennæ short, filiform, third joint longest; venation of *Pristiphora*, second cubital with both recurrent nervures; lanceolate cell petiolate; stigma ovate; tip of clypeus more or less emarginate; pentagonal area of vertex indistinctly outlined or wanting; claws simple, without inner tooth; sheath of female simple, obtusely pointed at tip.

This genus is separated from the preceding, *Pristiphora*, by the possession of a simple claw, without inner branch or tooth. The type of the genus is the species designated as *californicus*. Examination of the species of *Pristiphora* indicates also that *appendiculatus* Hartig (=*grossulariæ* Walsh) falls in this genus. These two species are very important ones economically, the latter being a well-known enemy of the gooseberry and the former reported to be a very serious enemy to the pear in various localities in California.

TABLE OF SPECIES.

Very short, robust; angles of pronotum broadly yellow.
- Clypeus and labrum black ..... 1. *californicus* n. sp.
- Clypeus and labrum pale ..... 2. *proximatus* Norton.

Somewhat less robust; pronotum unicolorous.
- Color black ..... 3. *appendiculatus* Hartig.
- Color resinous, inclined to reddish ..... 4. *resinicolor* n. sp.

### 1. Gymnonychus californicus new species.

*Female.*—Length 4.5 mm.; very short and robust, shining; head densely punctured, rather opaque; clypeus very slightly emarginate; frontal crest wanting or very slightly indicated; antennæ very short, not as long as head and thorax, filiform, third joint longest; intercostal nearly at right angles with costa, interstitial with basal; venation otherwise normal; stigma short, broad, ovate at base; apex of costa strongly thickened; sheath broad, slightly emarginate beneath and acuminate at tip; claws simple. Color black; angles of pronotum, tegulæ, trochanters, apices of femora (particularly anterior pair), tibiæ, and tarsi yellowish ferruginous; the posterior tibiæ and tarsi particularly somewhat infuscated; veins, including stigma and costa, dark brown; wings hyaline.

Eleven females, one collected at Brockport, N. Y., the others bred from larvæ found on pear trees near Sacramento, Cal., the adults issuing in March. (Coll. U. S. Nat. Mus.)

This sawfly was reported by Matthew Cooke to be very injurious in 1881–82 about Sacramento, Cal., and in adjoining counties. It feeds on the leaves of pear trees, skeletonizing them more or less, somewhat after the manner of the common cherry and pear slug. It forms little brown cocoons about the base of the tree, in which the larvæ hibernate, the adults issuing early in March. A second brood, apparently, was obtained in the latter part of April, indicating the probable occurrence of several annual broods. Mr. Koebele also sent specimens of this sawfly from Natoma, Cal., reporting it to be most destructive to pear trees in that region. He also noticed the same species ovipositing on pear trees at Santa Clara. If disturbed, the parent insect falls to the ground and remains

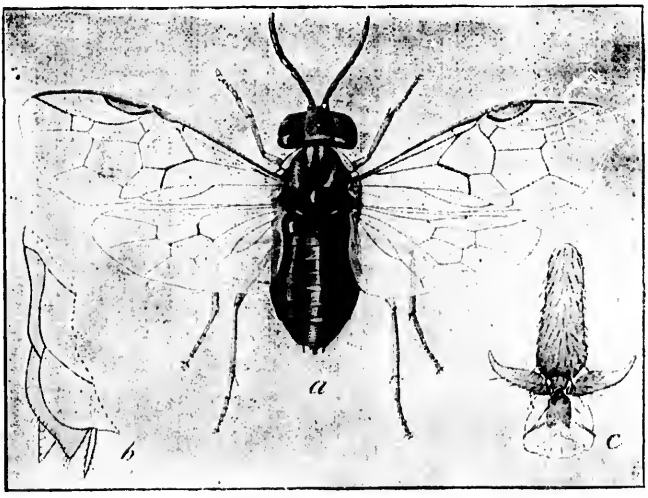


FIG. 10.—*Gymnonychus californicus: a*, female; *b*, lateral view of tip of abdomen, showing sheath and cercus; *c*, claw and pulvillus—all enlarged (original).

motionless for a time, with the antennæ and legs bent closely to the body. The characteristic features of the adult insect are indicated in the accompanying figure (fig. 10). It is probable that this is the undetermined pear sawfly referred to by Dr. J. A. Lintner as being very injurious in the Hammond nurseries, Geneva, N. Y., May 29, 1894. (2nd Rept. N. Y. State Entom., 1885, p. 5.)

### 2. **Gymnonychus proximatus** Norton.

1861. *Nematus proximatus* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 160.
1867. *Nematus proximatus* Norton. Trans. Am. Ent. Soc., I, p. 202. (Cat., etc., p. 64).
1878. *Nematus proximatus* Provancher. Nat. Can., X, p. 55.
1883. *Nematus proximatus* Provancher. Faun. Ent. Can. Hym., p. 185.

*Male.*—Length 5.5 mm.; rather slender, shining; head and thorax punctured; clypeus squarely truncate; crest of head rounded, almost

wanting; antennal fovea indistinct or wanting, at most very shallow; antennæ not very robust, flattened, tapering, joints 3 to 5 subequal; venation normal; stigma not very robust, tapering; procidentia very broad, obtuse, strongly keeled; hypopygium broad, rounded at apex; claws without inner tooth. Color black; clypeus, labrum, and mouth parts pallid; angles of pronotum, tegulæ, more or less of apical half of femora, the anterior tibiæ and tarsi, and the basal two-thirds of tibiæ yellowish; more or less of bases of femora, especially of hind pair and apices of hind tibiæ and tarsi, and the tips of anterior tarsi brownish black; veins, including stigma and costa, the latter nearly to base, dark brown.

One male. Canada. (Coll. Am. Ent. Soc.)

3. **Gymnonychus appendiculatus** Hartig.

1823. *Pristiphora pallipes* Lepeletier. Mongr. Tenth., p. 60.
1835. *Nematus flaripes* Dahlbom. Conspect. Tenth. Scan., p. 9.
1837. *Nematus appendiculatus* Hartig. Fam. Blat. Holtz., p. 202.
1866. *Pristiphora grossulariæ* Walsh. Pract. Ent., I, pp. 117–125.
1866. *Pristiphora grossulariæ* Walsh. Pract. Ent., II, pp. 20, 33.
1867. *Pristiphora grossulariæ* Norton. Trans. Am. Ent., Soc. I. p. 77.
1867. *Pristiphora grossulariæ* Walsh. Pract. Ent., II, p. 121.
1868. *Pristiphora rufipes* Fitch. 12th Rept. Ins. N. Y., p. 908.
1869. *Pristiphora grossulariæ* Walsh and Riley. Am. Ent., II, pp. 12–22.
1870. *Pristiphora grossulariæ* Packard. Guide to Study of Ins., p 217.
1870. *Pristiphora grossulariæ* Glover. Rept. U. S. Dept. Agr., p. 77.
1875. *Pristiphora grossulariæ* Glover. Rept. U. S. Dept. Agr., p. 118.
1877. *Pristiphora grossulariæ* Riley. 9th Rept. Ins. Mo., pp. 23–26.
1877. *Pristiphora grossulariæ* Packard. 9th Rept. U. S. Geol. and Geog. Surv., 1875, p. 787.
1877. *Pristiphora grossulariæ* Glover. Rept. U. S. Dept. Agr., p. 92.
1878. *Pristiphora grossulariæ* Provancher. Nat. Can., X, p. 56.
1880. *Pristiphora grossulariæ* Provancher. Nat. Can., XII, p. 126.
1880. *Pristiphora grossulariæ* Thomas. 5th Rept. Ins. Ill., p. 69.
1880. *Pristiphora rufipes* Thomas. 5th Rept. Ins. Ill., p. 70.
1883. *Pristiphora grossulariæ* Provancher. Faun. Ent. Can. Hym., II, p. 182.
1883. *Pristiphora grossulariæ* Stoddard. Am. Encycl., I, p. 135.
1883. *Pristiphora grossulariæ* Saunders. Ins. Inj. to Fruits, p. 343.
1890. *Pristiphora appendiculata* Konow. Deutsch. Ent. Zeit., XXXIV, p. 247.

*Female.*—Length 5 mm.; rather short, robust; head narrow, not nearly so broad as thorax; clypeus truncate; vertex smooth, shining; frontal crest nearly obsolete; antennæ slender, filiform, scarcely longer than head and thorax, joints decreasing in length apically from third; antennal fovea very minute, circular; sheath scarcely projecting, tapering, rather densely clothed with hairs; claws simple; first cubital cross vein entirely wanting. Color black, shining; tegulæ and legs light yellowish; bases of coxæ brown; anterior femora basally infuscated; antennæ fulvous or light yellowish beneath; wings nearly hyaline; veins and stigma yellowish brown. In some specimens the hind femora are also strongly infuscated.

Seven females. New York, Illinois, Missouri, and Colorado. (Coll. U. S. Nat. Mus.)

4. **Gymnonychus resinicolor** new species.

*Female.*—Length 5 mm.; moderately robust; clypeus squarely truncate; vertex smooth, shining; antennal fovea and ocellar basin obsolete; antennæ slender, scarcely tapering, third and fourth joints subequal; sheath not produced, rounded at tip; cerci very robust, short, acuminate; claws simple; intercostal vein nearly interstitial with basal; stigma broad, rounded on lower margin. Color dark resinous, inclined to reddish; spot about ocelli, center of anterior lobe of mesonotum, most of metanotum, and the center of dorsum of abdomen brownish black; antennæ brownish above; wings clear; veins yellowish brown; stigma lighter, almost hyaline.

One female. Fort Wrangel, Alaska. Mr. H. F. Wickham, collector. (Coll. U. S. Nat. Mus.)

## XVIII. Genus **DINEURA** Dahlbom.

*Dineura* Dahl., Conspect. Tenth. Scand., p. 13, 1835.

SPECIES.

*americana* Provancher. Nat. Can., XIII, p. 292, ♀, 1882. (Canada.)
*lateralis* Norton. Trans. Am. Ent. Soc., I, p. 240, ♀, 1867. (Maine.)
*linita* Norton. Trans. Am. Ent. Soc., I, p. 240, ♀, 1867. (Maine.)
*litura* Klug. Mag. Ges. Nat. Fr. Berlin, VIII, p. 83, ♀, 1814; Norton. Trans. Am. Ent. Soc., I, p. 240, 1867. (Georgia.)
*luteipes* Cresson. Trans. Am. Ent. Soc., VIII, p. 11, ♂, 1880. (Canada and Maine.)
*pallida* Ashmead. Bull. Col. Biol. Assn., I, p. 15, ♀, 1890. (Colorado.)

The species *linita* and *lateralis* are very closely allied, if not identical, and *luteipes* may prove to be merely the male of one of them.

## XIX. Genus **HEMICHROA** Stephens.

*Hemichroa* Steph. Ill. Brit. Ent., Mandib., VII, p. 55, 1838.

SPECIES.

*albidovariata* Norton. Trans. Am. Ent. Soc., IV, p. 81, ♀, 1872. (Texas and Florida.)
*fraternalis* Norton. Trans. Am. Ent. Soc., IV, p. 81, ♂, 1872. (Texas.)
*nigricans* Cameron. Trans. Ent. Soc. Lond., p. 482, 1881. (Mexico.)

The second species, *fraternalis*, will very probably prove to be the male of the first, as indicated both by resemblance and habitat.

## APPENDIX.

### DESCRIPTIONS OF SPECIES THE TYPES OF WHICH ARE LOST OR INACCESSIBLE.

The types of the following species have either been lost or are inaccessible. The latter applies to the species described by William F. Kirby, the types of which are in the British Museum. It is probable that Eschscholtz's two species are not now obtainable. Of the other species, one each described by Say, Fitch, and Walsh, and the rest by Norton, the type specimens are lost and I have been either unable to recognize them from the rather inadequate descriptions or to secure additional specimens representing them. A few of these species are so characterized that it is possible with tolerable accuracy to refer them to genera, and in such cases I have indicated the probable genus to which they belong. Some of those referred to *Pteronus* may, however, belong to *Amauronematus*, and some of those referred to *Pachynematus* may belong elsewhere. The descriptions by Kirby are so inadequate that nothing can be determined of the position or relationship of his species, and to properly refer them will necessitate an examination of the types themselves. The species the genera of which can not be determined, are all given under the old term *Nematus*, though probably none of them belong in this genus as now restricted. The original descriptions are quoted without change, and, other than those of Kirby's species, are taken from Norton's Catalogue.

INDEX TO SPECIES.



### 1. Amauronematus (?) fur Walsh.

1866. *Nematus fur* Walsh. Proc. Ent. Soc., Phila., VI, p. 263.
1867. *Nematus fur* Norton. Trans. Am. Ent. Soc., I, p. 206. (Cat., etc., p. 68.)
1895. *Nematus fur* Marlatt. Proc. Ent. Soc., Wash., III, p. 207.

*Male.*—Length 0.39 inch; br. wing 0.38 inch; black; head opaque, very minutely and closely punctuate, rugose; clypeus, labrum, the extreme tip of the cheek, and the base of the mandibles all dull greenish white; clypeus emarginate in a circular arc of about 45°, with a small tubercle in the middle of its anterior margin; labrum fully as long as wide, its tip rounded; antennæ black, four-fifths as long as body, rather more compressed than is usual in males, fourth and fifth joints equal in length, third shorter by one-fourth; thorax opaque, very minutely rugose, subpol-

ished on the pectus; a pale subtriangular tubercle on the lateral margin of the black, subpolished, basal plate; abdomen subpolished, bright fulvo-rufous, the basal edge of joint 1, next the basal membrane, which is whitish, clouded with black; genitals obfuscated; legs black; wings subhyaline, slightly tinged with fuliginous; veins and stigma black.

Rock Island, Ill.

One male bred March 29, from an old subpedunculed spherical gall of *Cecidomyia s. batatas* Walsh, on *S. humilis*. Female unknown. As the mother sawfly must have deposited her egg in this gall after the gall maker had quit it, or not long before, it is a question if this species can be considered an inquiline.

There is very little doubt but that this is the same with *N. luteotergum* male, which only differs in having the legs in part piceous and in being somewhat smaller.

(See note 2, p. 22.)

### 2. **Pteronus** (?) **hudsonicus** Norton.

1867. *Nematus hudsonicus* Norton. Trans. Am. Ent. Soc., I, p. 207. (Cat., etc., p. 69.)

Black; orbits, mouth, tegulæ, anterior angle, venter, and legs, except a black line on two posterior pair, white; length 0.38; br. wings 0.76 inch.

*Female.*—Antennæ less than half as long as the body, joints cylindrical, somewhat enlarged at tip, third and fourth of equal length; sutures at sides of ocelli deep; ocelli in a triangular basin; nasus very slightly emarginate; orbits, space about antennæ and mouth beneath, tegulæ, anterior angle (a black line in middle), and the venter whitish, the latter with a row of black spots on each side forming an interrupted black line; scutel large, produced behind a slightly raised angle; legs dull white, with the basal upper half of anterior femora, a line down the upper side of posterior femora, and tibiæ and their tarsi black; anterior inner spur of tibiæ blunt, bifid; inner tooth of claw large; wings hyaline; stigma and costa brown; emargination of stigma distinct.

One female. Fort Good Hope, Mackenzie River, Hudson Bay Territory (R. Kennicott).

### 3. **Pteronus** (?) **lateralis** Norton.

1867. *Nematus lateralis* Norton. Trans. Am. Ent. Soc., I, p. 211. (Cat., etc., p. 73.)

Black; orbits, face below antennæ, pleura, body, body beneath (except breast), and legs pale; length 0.38; br. wings 0.76 inch.

*Female.*—Antennæ half the length of body, joints cylindrical, third and fourth equal, slightly enlarged at tips; sutures at sides of ocelli deep; lower ocellus in a shallow circular space, which has a distinct ridge around its upper half; nasus produced, distinctly emarginate in middle and at sides; tongue and palpi dark, last joint of maxillary palpi shorter than the preceding; the whole orbits as far as sutures, two spots behind ocelli, a spot above antennæ, space around, and face below reddish white; sutures of metathorax and a bent line between upper wings crossing upper half of scutel rufous; tegulæ, anterior angle, pleura, and body beneath except a black spot on breast reddish white; legs the same color; tarsi fuscous; a slender black line on the upper and lower side of femora, and less distinctly on the posterior tibiæ; anterior inner tibial spur bifid; inner claw tooth large and near the tip; wings hyaline; nervures black; stigma pale, with little or no emargination above; second recurrent nervure received at a distance from the intersection of second and third cells.

Var. Abdomen almost entirely pale.

Three females. Brunswick, Me. (A. S. Packard). Albany, N. Y. (Dr. Peck).

This species, though distinct from, seems somewhat closely allied to my *hyalinus* n. sp.

### 4. **Pteronus longulicornis** Norton.

1835. *Nematus longicornis* Say. Boston Journ. Nat. Hist., I, p. 219.
1859. *Nematus longicornis* Say. LeConte, Say's Entomology, II, p. 679.
1861. *Nematus longicornis* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 158.
1867. *Nematus longulicornis* Norton. Trans. Am. Ent. Soc., I, p. 214. (Cat., etc., p. 76.)

Black; orbits, face below antennæ, tegulæ, anterior angle, pleura (except black spot on female), the whole body beneath, and legs whitish. Length 0.26; br. wings 0.54 inch.

*Female.*—Body rather long; antennæ black, more than two-thirds the body, slender, third and fourth joints equal; head rather smooth; sutures at sides of ocelli distinct; lower ocellus in a basin, which is smooth and shining, obovate, with distinct edges; nasus angulate, emarginate; labrum emarginate; a spot on vertex from antennæ to summit, and the back of head black; remainder pale; a slender ridge runs through the groove on anterior lobe of thorax; the tegulæ, anterior angle, pleura, and whole body beneath whitish, except two black spots on pleura, the anterior one large and lunulate; scutel black; sutures of abdomen indistinctly pale; legs pale, with the apical half of hinder femora and tibiæ and their tarsi blackish; inner tooth of claws large and near the tip; wings hyaline; stigma full; nervures and stigma piceous; base of stigma and costa pale.

*Male.*—Antennæ fulvous beneath, third joint shorter than fourth, curved at base; a straight, black line under the anterior wings; tips of posterior tibiæ blackish, their femora pale; stigma color of costa.

Iowa (Say), Connecticut, New York, Pennsylvania, Great Slave Lake, Hudson Bay Territory.

This species seems to be allied to *cornelli* n. sp.

### 5. **Pteronus (?) nortonii** Dalla Torre.

1867. *Nematus fallax* Norton. Trans. Am. Ent. Soc., I, p. 198. (Cat., etc., p. 60.)
1894. *Nematus nortonii* Dalla Torre. Cat. Hym., I, p. 246.

Black; mouth, cheeks, apex of venter, and tibiæ in part reddish white; a black line down the tibiæ above; body slender; length 0.18 to 0.20; br. wings 0.44 to 0.48 inch.

*Male.*—Shining black; body slender; antennæ rather long and slender, ferruginous beneath; nasus hardly incurved and with mouth below; lower half of cheeks and apex of venter yellow red; legs at base black, below the base of femora yellow red, with a blackish line down their upper side; inner anterior tibial spur stout; inner tooth of claw nearly as large as outer; wings perfectly hyaline, iridescent; stigma somewhat rounded above and with the costa pale greenish.

Labrador (A. S. Packard, jr.). Two males.

### 6. **Pteronus rufofasciatus** Norton.

1867. *Nematus rufo-fasciatus* Norton. Trans. Am. Ent. Soc., I, p. 205. (Cat., etc., p. 67.)

Black; a band on the middle of abdomen and most part of legs rufous; wings smoky hyaline; length 0.34; br. wings 0.70 inch.

*Female.*—Black; body long and moderately stout; antennæ about two-thirds the length of body, slender, cylindrical, third joint but little longer than fourth; head dull, with coarse, confluent punctures; nasus coarsely punctured, deeply channeled across the middle, angulate, emarginate; edge of labrum incurved; outer orbit and a spot opposite ocelli on each side, labrum, and palpi rufous; upper half of anterior angle and basin on each side of scutel rufous; abdomen, except the basal plates and three apical segments, chestnut red; legs the same color; coxæ, except at tip, black; anterior inner tibial spur stout, apparently bifid; inner claw tooth large; wings smoky hyaline, nervures piceous; stigma and costa pale.

Mackenzie River, Hudson Bay Territory (R. Kennicott).

### 7. Pteronus (?) satkatchewan Norton.

1867. *Nematus satkatchewan* Norton. Trans. Am. Ent. Soc., I, p. 200. (Cat., etc., p. 62.)
1878. *Nematus satkatchewan* Provancher. Nat. Can., X, p. 56.
1883. *Nematus satkatchewan* Provancher. Faun. Ent. Can. Hym., p. 187.

Black; tegulæ black; breast rufous; legs mostly yellow red; wings hyaline; length 0.38; br. wings 0.76 inch.

*Female.*—Shining black; body long; antennæ long and slender, apical joint shorter than the preceding; the ocelli, seen from before, are each in a separate basin; nasus incurved; fourth joint of palpi short, fifth and sixth longer and very slender; thorax polished; labrum piceous; a large chestnut-red spot on pectus; legs same color; the trochanters and anterior tarsi whitish; posterior tibiæ, except at their base, and their tarsi black; anterior tibial inner spur stout, blunt pilose so as to appear bifid; inner claw tooth large; wings hyaline; stigma black.

Lake Sathkatchewan (Smithsonian Institution). One female.

### 8. Pachynematus (?) malacus Norton.

1867. *Nematus malacus* Norton. Trans. Am. Ent. Soc., I, p. 196. (Cat., etc., p. 58.)
1878. *Nematus malacus* Provancher. Nat. Can., X, p. 53.
1883. *Nematus malacus* Provancher. Faun. Ent. Can. Hym., p. 185.

Black; tegulæ, trochanters, and legs below knees pale; length 0.28; br. wings 0.60 inch.

*Female.*—Shining black; body short and stout; antennæ slender, joints of nearly equal length; lower ocellus in a shallow basin; nasus hardly incurved; tegulæ and collar whitish; coxæ, femora, and tips of posterior tibiæ and of all the tarsi black; claws slightly dentate within; trochanters, anterior femora before, tibiæ, and tarsi except at tip white; wings hyaline; stigma and costa pale greenish, second submarginal widest at first recurrent nervure.

Labrador (A. S. Packard, jr.). Three females.

### 9. Pachynematus (?) nigritus Norton.

1861. *Nematus nigritus* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 159.
1867. *Nematus nigritus* Norton. Trans. Am. Ent. Soc., I, p. 201. (Cat., etc., p. 63.)

Black; outer orbits and mouth, tegulæ, apex of abdomen, and legs in part pale; length 0.21; br. wings 0.48 inch.

*Female.*—Black; body slender; antennæ two-thirds the length of body, slightly flattened and enlarged at joints, third joint shorter than fourth; nasus hardly emarginate; an outer orbital line as high as suture, edge of nasus and beneath pale piceous; tegulæ and apex of abdomen and several apical segments of vertex yellowish; trochanters, apical half of femora, tibiæ except tips of hinder pair, and base of tarsi reddish white; remainder black; inner tooth of claw very short, blunt and distinct from outer tooth; wings hyaline, nervures piceous, middle of stigma and base of costa paler; second submarginal cell with one angle below, the second recurrent nervure coinciding with dividing nervure.

Connecticut. Two males. This may be the male of *N. subalbatus*.

### 10. Pachynematus (?) sumptus Norton.

1867. *Nematus sumptus* Norton. Trans. Am. Ent. Soc., I, p. 207. (Cat., etc., p. 69.)

Black; mouth, orbits, and tegulæ white; basal half of abdomen, spot on pleura; and most part of legs rufous; length 0.28; br. wings 0.62 inch.

*Male.*—Body long; head large; mouth below antennæ, the outer orbits extending over the back of head, and a narrow inner orbital line interrupted opposite ocelli yellow; nasus emarginate; tegulæ and anterior angle whitish; abdomen chestnut

red, the two apical segments blackish; an indistinct, piceous, perpendicular spot on pleura near breast; coxæ and trochanters whitish; remainder of legs rufous, paler before, except the posterior tibiæ and tarsi, which are blackish; hinder tibiæ somewhat swelled; inner tooth of claws very obtuse, hardly visible; wings hyaline, faintly smoky; stigma dark brown.

Maine (A. S. Packard). One male.

### 11. Lygæonematus (?) monela Norton.

1867. *Nematus monela* Norton. Trans. Am. Ent. Soc., I, p. 198. (Cat., etc., p. 60.)
1878. *Nematus monela* Provancher. Nat. Can., X, p. 54.
1883. *Nematus monela* Provancher. Faun. Ent. Can. Hym., p. 184.

Black; mouth, spot on cheeks, tegulæ, collar, and venter pale; base of coxæ and of femora and tips of hinder tibiæ black; length 0.20; br. wings 0.48 inch.

*Male.*—Black; body slender; antennæ slightly compressed, third joint hardly as long as fourth; lower ocellus in a small basin; nasus emarginate; edge of nasus, labrum, and spot at base of mandibles white; tegulæ, two edges of anterior angle, and apex of venter yellow red; legs yellow red; trochanters white; base of coxæ, base of femora and a line beneath extending nearly to tip, apex of posterior tibiæ, and their tarsi black; inner apical tarsal spur blunt; inner claw tooth small and widely separated from outer; wings hyaline; stigma and costa pale, waxen color.

Labrador. Two males. (Mr. Packard.)

### 12. Nematus calais Kirby.

1882. *Nematus calais* Kirby. List. Hym. Brit. Mus., I, p. 144.

Exp. al. 8 lin.; long. corp. 4 lin.

*Female.*—Head and thorax black, finely punctured; pleura and pectus shining; abdomen testaceous, the last two segments blackish; legs testaceous, four front femora blackish at base, intermediate tibiæ with a dark line above; hind tibiæ and tarsi blackish, the former rather widened and flattened; wings hyaline, with piceous stigma and nervures; fore wings clouded in the middle, and with apparently only three submarginal cells, the two first being divided by a white nervure.

Arctic America, Mackenzie River.

### 13. Nematus castaneus Kirby.

1882. *Nematus castaneus* Kirby. List Hym. Brit. Mus., I, p. 147.
1893. *Nematus castaneus* McGillivray. Can. Ent., XXV, p. 237.

Exp. al. 9 lin.; long. corp. 4¼ lin.

*Female.*—Chestnut color; head, mesothorax, and pleura darker; antennæ, a large square spot on the vertex, a spot in front of the thorax, and the pectus black; an irregular spot covering the hinder half of the scutellum, the postscutellum, a portion of the first segment of the abdomen, and extremities of hind tibiæ and hind tarsi dusky; wings hyaline, fore wings slightly yellowish; stigma and nervures piceous.

Hudson Bay, St. Martin's Falls, Albany River.

### 14. Nematus extraneus Kirby.

1882. *Nematus extraneus* Kirby. List Hym. Brit. Mus., I, p. 142.

Exp. al. 7 lin.; long. corp. 3 lin.

*Female.*—Testaceous; two basal joints of antennæ, a large irregular spot on vertex, and three large spots on the thorax black; abdomen with a black band in the middle, covering most of the three first segments and expanded on the three following ones, ceasing with segments 7 and 8, on which it is not expanded; extremities of hind tibiæ and of joints of hind tarsi slightly marked with blackish above; wings hyaline; costa and stigma pale yellowish; three submarginal cells.

Hudson Bay, St. Martin's Falls, Albany River

### 15. Nematus inconspicuus Kirby.

1882. *Nematus inconspicuus* Kirby. List Hym. Brit. Mus., I, p. 141.

Exp. al. 8 lin.; long. corp. 4 lin.

*Female.*—Head, antennæ, thorax, and pectus black; mouth and prothorax yellowish; abdomen black above and testaceous beneath, with a narrow border on the sides and at the back of each segment; legs testaceous; wings hyaline; costa yellowish; three submarginal cells.

New York.

### 16. Nematus longicornis Eschscholtz.

1822. *Nematus longicornis* Eschscholtz. Entomogr., p. 98.

1823. *Nematus longicornis* Eschscholtz. Nat. Abh. Dorp., I, p. 149.

1867. *Nematus longicornis* Norton. Trans. Am. Ent. Soc., I, p. 202. (Cat., etc., p. 64.)

Black, with the margin of tergum fuscous; the venter and legs pale, posterior femora black, costa of wings pale, stigma brown, head black, labrum yellowish, eyes clear gray; length 2½ lines; antennæ longer than the moiety of body, setaceous, black; corselet black, its anterior border forming a yellowish collar; abdomen wide, flat; back brownish; lateral margins of a clear yellow; venter yellow; wings longer than the body, narrow, transparent; costa yellow; stigma and nervures brown; three discoidal cells; legs yellow; posterior femora black-brown in the middle.

Isle of Unalaska, Russian America.

### 17. Nematus neglectus Kirby.

1882. *Nematus neglectus* Kirby. List Hym. Brit. Mus., I, p. 147.

Exp. al. 8 lin.; long. corp. 4 lin.

*Female.*—Head and thorax black; mouth and prothorax pale; a more or less complete testaceous ring around the eyes; sides of pectus sometimes with a dull rufous spot; abdomen testaceous, first two segments black at base above; legs testaceous; front femora black at base; middle femora and hind legs black; hind tibiæ rufous beneath; wings hyaline, male with three and female with four submarginal cells; stigma yellowish.

Hudson Bay, St. Martin's Falls.

### 18. Nematus obscurus Norton.

1861. *Nematus obscurus* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 160.

1867. *Nematus obscurus* Norton. Trans. Am. Ent. Soc., I, p. 203. (Cat., etc., p. 65.)

Dull black; tegulæ, base of abdomen, and knees indistinctly ferruginous; length 0.25; br. wings 0.58 inch.

*Female.*—Black, pubescent; third joint of antennæ a little longer than fourth; clypeus crenate; labrum brownish red, shining; mandibles rufous at tip; palpi pale; a longitudinal groove upon scutellum; basal membrane, sides of tergum, knees, and front of tibiæ indistinctly ferruginous; abdomen stout; wings faintly clouded; stigma dull fuscous; costa black.

Massachusetts.

### 19. Nematus obtusus Kirby.

1822. *Nematus crassus* Eschscholtz. Entomogr., p. 213.

1823. *Nematus crassus* Eschscholtz. Naturw. Abh. Dorp., I, p. 149.

1867. *Nematus crassus* Norton. Trans. Am. Ent. Soc., I, p. 213. (Cat., etc., p. 75.)

1882. *Nematus obtusus* Kirby. List Hym. Brit. Mus., I, p. 148.

Black; sides of the head, lines on the thorax, scutellum, and pleura chestnut; tibiæ pale; length 4 lines.

Body thick; head black in the middle, of a nut brown on the sides; parts of the

mouth yellow; antennæ longer than the moiety of the body, filiform, black; border of the corselet brown; two longitudinal lines on the thorax; scutel and the greater part of the thorax of a chestnut brown; abdomen convex, shining black; wings longer than the body, wide, transparent; stigma and costa yellow; nervures brown; marginal cell simple, extending almost to the tip; three discoidal cells; legs yellow; a long black spot under the anterior femora; posterior femora black, at the extremity yellow.

Isle of Unalaska, Russian America. Not seen (Norton).

### 20. **Nematus suratus** Fitch.

1856. *Nematus suratus* Fitch. 3d Rept. N. Y. Agr. Soc., p. 315, No. 94. (3rd Rept. Ins. N. Y., p. 68.)

1861. *Nematus suratus* Norton. Proc. Bost. Soc. Nat. Hist., VIII, p. 159.

1867. *Nematus suratus* Norton. Trans. Am. Ent. Soc., I, p. 196. (Cat., etc., p. 60.)

Black, with four transparent, slightly smoky wings; mouth, cloud-like spot on the shoulders, edges of abdominal segments, and legs livid white; the four anterior thighs being black upon their undersides and the hinder pair wholly black, except at their base; length 0.25 inch; to the tip of wing 0.30 inch.

New York. Not seen (Norton).

Food-plant, cherry.

### 21. **Nematus trifurcatus** Kirby.

1882. *Nematus trifurcatus* Kirby. List Hym. Brit. Mus., I, p. 148.

Exp. al. 8 lin.; long. corp. 4 lin.

*Female.*—Testaceous; antennæ black; a large square black spot on vertex; three large black spots in front and on the sides of the thorax, sometimes nearly confluent; hinder half of the scutellum black; all the segments of the abdomen except the last (beyond which the black tips of the saws and sheaths project) are more or less broadly banded with purplish black in the middle; sides and under surface testaceous; fectus black in the middle; a black line down the hind legs; wings hyaline; nervures piceous; stigma yellowish; three submarginal cells.

This species appears to be allied to *N. crassus* Esch. (*obtusus* Kirby), from Alaska.

Hudson Bay, St. Martin's Falls, Albany River.

### 22. **Nematus abbotii** Kirby.

1882. *Hypolæpus abbotii* Kirby. List Hym. Brit. Mus., pp. 324–325.

Exp. al. 11 lin.; long. corp. 6 lin.

*Female.*—Blue black, shining; third segment of abdomen testaceous on the sides, and less distinctly so above; wings iridescent, clear hyaline toward the base, and more dusky beyond, with blackish nervures.

North America (Georgia). Probably from Abbott's collection.

# INDEX TO GENERA AND SPECIES.