

A TAXONOMIC AND ECOLOGICAL REVIEW OF THE
NORTH AMERICAN CHALCID-FLIES OF
THE GENUS CALLIMOME

BY L. L. HUBER

Of the Department of Entomology, Ohio Agricultural Experiment Station

INTRODUCTION

Until careful work is done on the taxonomy of a group it is difficult to gain an adequate conception of its biology. The purpose of this study is, therefore, to establish a working basis for a certain part of the Chalcidoid complex, especially in as far as this complex pertains to galls or gall-like formations.

This study deals with 112 species of Chalcidoidea, 104 of which belong to the genus *Callimome* Spinola. Of the 104 species treated under *Callimome* 11 are unrecognized, and of the 112 species listed as Chalcidoidea 8 were wrongly classified. To accommodate these 8 species it has been necessary to transfer 6 to previously described genera and to erect 2 new genera for the other 2.

ACKNOWLEDGMENTS

The writer wishes to express his acknowledgments to those who in some special way have given aid in the preparation of this paper. To S. A. Rohwer and A. B. Gahan for their advice and assistance while working on material deposited in the National collection, and for library facilities as well as many other courtesies shown while engaged in study in the United States National Museum, the writer wishes to express his sincere gratitude. Grateful acknowledgment is also made to Prof. Herbert Osborn for valuable suggestions. The writer further wishes to express his deep appreciation to Dr. A. C. Kinsey for the loan of Chalcidoid specimens reared from Cynipid galls. Acknowledgment of indebtedness is also due to J. McDunough and Nathan Banks for comparing specimens with types.

CLASSIFICATION

Superfamily CHALCIDOIDEA

Family CALLIMOMIDAE

Subfamily CALLIMOMINAE

Genus CALLIMOME Spinola

Callimome SPINOLA, Ann. Mus. Nat., vol. 17, 1811, pp. 146-148. Genotype, *Ichneumon bedeguaris* Linnaeus. (Designated by Curtis.)

Misocampus LATREILLE, Nouv. dict. hist. nat., ed. 2, 1817, p. 213.

Torymus DALMAN, Svensk. Vet. Akad. Handl., vol. 41, 1820, pp. 135-158.

Syntomaspis FÖRSTER, Hym. Stud., vol. 2, 1856, p. 43-44. Genotype, *Syntomaspis (eurynotus)* Förster) = *cyaneus* Boheman.

Syntomaspis Förster, W. H. ASHMEAD, Memoirs Carnegie Museum, vol. 1, No. 4, 1904, p. 241.

Additional references used in the preparation of this paper are Dalla Torre's Catalogus Hymenopterorum, volumes 2 and 5, and Gahan and Fagan's List of Genotypes, Bulletin 124, United States National Museum, 1923.

DESCRIPTION OF THE GENUS

The subfamily *Callimominae* is characterized, according to Dr. W. H. Ashmead (1904) by having two spurs on the hind tibiae, a hind femur which is smooth on its lower margin (except that in a few species this margin may be minutely roughened) and a very short stigmal vein. The antennae have 13 joints.

Generic characters.—Antenna with one ring-joint, the joints of the funicle more or less uniform; transverse cross furrow on the posterior one-third of the scutellum very deep to very inconspicuous; stigmal vein shortly petioled to sessile, and never as long as the postmarginal vein; marginal vein shorter than the submarginal; abdomen sessile.

A careful study of the generic characters as indicated, together with the characterization of the subfamily to which the genus belongs, should make it easily possible to recognize the genus *Callimome*. In addition to these characters a knowledge of the habitus of the genus is often of special value in giving a clear perspective. As is true apparently of the majority of the species belonging to the subfamily *Callimominae*, the most of the species belonging to the genus *Callimome* are parasitic on gall making or gall inhabiting insects. Exceptions to this general rule are a few species which are phytophagous. While it is quite likely that the majority of the still undiscovered and undescribed species will belong to the truly parasitic group rather than the phytophagous group, yet it is not improbable that many species having the phytophagous habit or some variation of this habit will be discovered later. It is to be expected, too, that we will

find still other species with habits that will tend to connect these two habitus groups which now seem to be more or less widely divergent.

NOMENCLATURE AND TAXONOMY

The genus *Callimome* was erected in 1811 by Spinola. *Misocampus* Latreille and *Torymus* Dalman are both isogenotypic with *Callimome* Spinola.¹ *Syntomaspis* Förster has been distinguished from the other genera chiefly by the presence or absence of a transverse cross furrow on the apical portion of the scutellum. In this study the value of the cross furrow has been carefully considered not only as it stands by itself, but also in combination with other characters. My conclusion, after having examined over 100 species and several hundred specimens, is that this cross furrow should not be considered as of generic value.

The cross furrow varies in two different ways: 1. In a series of individuals of the same species it is often found that many specimens have a cross furrow which can be seen very easily, while others of the series seem to have none at all. The character is inconstant even in specimens reared from the same host and quite probably the offspring of the same parents. 2. The character varies in different species. In some it is very marked, while in other it is discernible only at certain angles, due apparently to a difference in the sculpture of the scutellum.

The genotype of *Syntomaspis* Förster (*Syntomaspis eurynotus* Förster) has a very deep and very distinct cross furrow on the scutellum. The genotype of *Callimome* (= *Torymus*) (*Ichneumon bedeguaris* Linnaeus) also has a very deep and very distinct cross furrow. It is apparent, therefore, that this character can not be used to separate these genera.

Primarily there are two types of stigmal veins—sessile and petioled. (See figs. 1–100.) Attention is called here to the fact that both of the genotypes mentioned above have a petioled stigmal vein. Examination of many individuals of a species indicates that the types of stigmal veins are practically constant. However, if the type of stigmal vein were used as a generic character it would necessitate the erection of a new genus to include those species which have the stigmal vein sessile. A study of the drawings alone might lead to the conclusion that differences in the stigmal vein are sufficiently distinct to be of generic value. However, in some cases it is not easy to distinguish between a petioled and a subsessile vein, for it is not a long step from a subsessile to a petiolate condition. Furthermore it is not illogical to expect that with the discovery of new species some will be found to bridge this gap.

¹Gahan and Fagan. Bull. 124, U. S. Nat. Mus., 1923, pp. 26 and 91.

The genotypes of *Syntomaspis* and *Callimome* (= *Torymus*) agree in essential generic characters, and since the available morphological characters and biological information do not justify the erection of a new genus, I have chosen to treat the whole complex under the name *Callimome*.

DISTRIBUTION

Geological.—That *Callimome* Spinola is not a recent group is evidenced by the fact that Brues² records fossil remains of a specimen which he assigned to this genus. *Callimome bruesi*, new name for *Torymus sackeni* Brues, preoccupied by *Torymus sackeni* Ashmead, was found in the Lower Oligocene in the Florissant shales, Colorado. It is a very large species and in some respects is said to resemble *Callimome magnificentum* Osten Sacken.

Geographical.—It is possibly safe to say that representatives of this genus will ultimately be found wherever gall insects and their plant hosts are abundant. This paper includes species from Alaska, Canada, Mexico, West Indies, Japan, South America, and 27 States of the United States. Those from South America and Japan are listed here only because they are in the National collection.

HOST RELATIONSHIPS

It is very evident, as may be seen from a study of the host index, that the majority of the species of the genus *Callimome* are parasites of either Hymenopterous or Dipterous gallmakers. It will be noted, too, that in the specific key the genus is divided into two groups, namely Group A and Group B. The species of the first group greatly prefer Cynipidae as hosts, while those belonging to Group B show a preference for the Itonidae. Concerning the species for which we have complete data it is found that in Group A, 27 species have Cynipid hosts and 10 species have Dipterous hosts. In Group B, 13 species were reared from Cynipid galls and 15 species from Dipterous hosts. In this connection it is interesting to note, that of the species of Group A, which prefer Cynipid hosts, 24 were reared from galls on *Quercus*³; and of the 13 species of Group B, which prefer Cynipid hosts, 11 species were reared from galls on *Rubus* or *Rosa*.

The phytophagous habits of some of the species of *Callimome* deserve special attention at this time. Five species have been recorded as either wholly or partially phytophagous. Whether they have inherited this phytophagous habit from the earliest ancestors, which can be assumed to have been phytophagous, or whether they have become phytophagous after having passed through a parasitic or semi-

² Parasitic Hymenoptera of the Tertiary of Florissant, Colorado. Bull. Mus. Comp. Zool., vol. 54, No. 1, p. 17, 1910.

³ This paper was submitted before the recent revision of the species of oaks by Prof. William Trelease appeared and throughout the paper the old names for species of *Quercus* are used.

parasitic stage, is a matter of considerable speculation. Gahan⁴ in a recent paper discusses the development of phytophagy in Chalcidoids and seems to have arrived at the conclusion that phytophagy is probably a recent development.

Two of the apparently phytophagous species are found in North America. *Callimome druparum* (Boheman), also found in Europe, is the only one in North America that is definitely known to be phytophagous. The larvae of this species feed upon the seeds of apple (*Pyrus*) and of the mountain ash (*Sorbaria*). *Callimome amelanchieris* (Cushman) was reared from seeds of *Amelanchier canadensis* (Linnaeus) Medicus. Cushman⁵ thinks it is doubtfully phytophagous and suggests that it may sometimes be parasitic on a species of *Megastigmus*.

Callimome advenum Osten Sacken is one of the most unique of all in its host relationships. It seems to be a parasite of a Cynipid gall maker as well as three different species of Dipterous gall makers; it was also reared from the seeds of *Amelanchier canadensis* in the same lot of material as *Callimome amelanchieris* (Cushman). Whether it is truly phytophagous can not be stated at this time.

A species apparently overlooked until the present time and which may be phytophagous, is *Callimome thompsoni*, (Fyles) which has been reported as ovipositing in plums.

HOSTS OF THE SPECIES OF CALLIMOME

Dalla Torre's Catalogus Hymenopterorum (volumes 2 and 5) has served as a guide in the preparation of this list. As will be noted in the following pages, the hosts have been listed under five headings, namely, Hymenoptera, Diptera, Homoptera, Phytophagous, and Miscellaneous.

Host	HYMENOPTERA	Parasite
<i>Amphibolips acuminata</i> Ashmead.....	<i>Callimome melanocerae</i>	Ashmead.
<i>Amphibolips championi</i> (Cameron) Ashmead	<i>Callimome mexicanum</i>	(Ashmead).
<i>Amphibolips cinerea</i> Ashmead	<i>Callimome coeruleum</i>	Ashmead.
<i>Amphibolips citriformis</i> (Ashmead) Dalla Torre	<i>Callimome melanocerae</i>	Ashmead.
<i>Amphibolips coccinea</i> (Osten Sacken) Ashmead	<i>Callimome coccineum</i> Huber; <i>melanocerae</i> Ashmead; <i>tubicola</i> Osten Sacken.	
<i>Amphibolips confluentis</i> (Harris) Cresson..	<i>Callimome coccineum</i> Huber; <i>racemareae</i> Ashmead.	
<i>Amphibolips fuliginosa</i> Ashmead.....	<i>Callimome racemareae</i> Ashmead; <i>robustum</i> Huber.	
<i>Amphibolips gainesi</i> Bassett.....	<i>Callimome racemareae</i>	Ashmead.

⁴ Gahan, A. B. List of Phytophagous Chalcidoidea with descriptions of two new species, Proc. Ent. Soc. Wash., vol. 24., No. 2, 1922.

⁵ Cushman, R. A. The Apple Seed Chalcid, Journ. Agr. Res., vol. 7., No. 11, U. S. D. A., 1916.

Host	Parasite
<i>Amphibolips globulus</i> Beutenmueller.....	<i>Callimome melanocerae</i> Ashmead; <i>racemareae</i> Ashmead; <i>tubicola</i> Osten Sacken.
<i>Amphibolips inanis</i> (Osten Sacken) Mayr.	<i>Callimome melanocerae</i> Ashmead; <i>racemareae</i> Ashmead.
<i>Amphibolips melanocerae</i> (Ashmead).....	<i>Callimome melanocerae</i> Ashmead.
<i>Amphibolips prunus</i> (Walsh) Mayr.....	<i>Callimome racemareae</i> Ashmead.
<i>Amphibolips racemaria</i> Ashmead.....	<i>Callimome racemareae</i> Ashmead.
<i>Amphibolips trizonata</i> Ashmead.....	<i>Callimome bicoloratum</i> Huber.
<i>Amphibolips, species</i>	<i>Callimome cinerosum</i> Huber.
<i>Andricus californicus</i> (Bassett) Mayr....	<i>Callimome californicum</i> (Ashmead).
<i>Andricus californicus-californicus</i> Kinsey	<i>Callimome californicum</i> (Ashmead).
<i>Andricus californicus-glabrescens</i> Kinsey	<i>Callimome californicum</i> (Ashmead).
<i>Andricus castanopsidis</i> Beutenmuller....	<i>Callimome castanopsidis</i> Huber.
<i>Andricus championi</i> (Cameron) Ashmead	<i>Callimome mexicanum</i> (Ashmead).
<i>Andricus flocci</i> (Walsh) Osten Sacken....	<i>Callimome aeneum</i> Ashmead; <i>melanocerae</i> Ashmead; <i>tubicola</i> Osten Sacken.
<i>Andricus operator</i> (Osten Sacken) Mayr.	<i>Callimome tubicola</i> Osten Sacken.
<i>Andricus pacificus</i> Ashmead.....	<i>Callimome californicum</i> (Ashmead); <i>giganticum</i> Huber.
<i>Andricus petiolicola</i> (Bassett) Osten Sacken.	<i>Callimome tubicola</i> Osten Sacken.
<i>Andricus pomiformis</i> (Bassett) Ashmead	<i>Callimome californicum</i> (Ashmead).
<i>Andricus seminator</i> (Harris) Osten Sacken	<i>Callimome tubicola</i> Osten Sacken.
<i>Andricus singularis</i> (Bassett) Mayr....	<i>Callimome tubicola</i> Osten Sacken.
<i>Andricus tubicola</i> (Osten Sacken) Mayr.	<i>Callimome tubicola</i> Osten Sacken.
<i>Andricus virens</i> (Ashmead).....	<i>Callimome acneum</i> Ashmead; <i>sackeni</i> Ashmead.
<i>Argidae, species</i>	<i>Callimome tubicola</i> Osten Sacken.
<i>Callirhytis q-agrifoliae</i> (Bassett).....	<i>Callimome fullawayi</i> Huber.
<i>Callirhytis rossi</i> Kieffer.....	<i>Callimome californicum</i> (Ashmead).
<i>Cynips ficus</i> (Fitch) Osten Sacken.....	<i>Callimome elegantissimum</i> (Ashmead).
<i>Diastrophus cuscutaeformis</i> Osten Sacken	<i>Callimome duplicatum</i> Huber.
<i>Diastrophus nebulosus</i> Osten Sacken....	<i>Callimome advenum</i> Osten Sacken; <i>flavicornum</i> Osten Sacken; <i>sackeni</i> Osten Sacken.
<i>Diastrophus turgidus</i> Bassett.....	<i>Callimome sackeni</i> Osten Sacken.
<i>Diastrophus, species</i>	<i>Callimome flavicornum</i> Osten Sacken.
<i>Diplolepis basseti</i> (Beutenmueller) Kinsey	<i>Callimome chrysochlora</i> Osten Sacken.
<i>Diplolepis californica</i> Kinsey.....	<i>Callimome chrysochlora</i> Osten Sacken.
<i>Diplolepis ignota</i> (Osten Sacken) Kinsey	<i>Callimome chrysochlora</i> Osten Sacken.
<i>Diplolepis rosae</i> (Linnaeus) Kinsey.....	<i>Callimome chrysochlora</i> Osten Sacken.
<i>Disholcaspis corallina</i> (Bassett).....	<i>Callimome californicum</i> (Ashmead); <i>californicum</i> variety <i>subdolum</i> Huber; <i>giganticum</i> Huber.
<i>Disholcaspis chrysolepidis</i> Beutenmueller.	<i>Callimome californicum subdolum</i> Huber.
<i>Disholcaspis cinerosa</i> Bassett.....	<i>Callimome cinerosum</i> Huber; <i>racemareae</i> Ashmead; <i>warreni</i> Cockerell.

Host	Parasite
<i>Dischalcaspis fasciata</i> Basset.....	<i>Callimome aereum</i> Huber; <i>racemareae</i> Ashmead.
<i>Disholcaspis ficigera</i> (Ashmead).....	<i>Callimome elegantissimum</i> (Ashmead).
<i>Disholcaspis floridana</i> (Ashmead).....	<i>Callimome aeneum</i> Ashmead.
<i>Disholcaspis globulus</i> Fitch.....	<i>Callimome melanocerae</i> Ashmead; <i>racemareae</i> Ashmead; <i>tubicola</i> Osten Sacken.
<i>Disholcaspis maculipennis</i> Gillette.....	<i>Callimome californicum</i> (Ashmead); <i>giganticum</i> Huber; <i>perplexum</i> Huber.
<i>Disholcaspis omnivorae</i> (Ashmead).....	<i>Callimome aeneum</i> Ashmead.
<i>Disholcaspis plumella</i> Kinsey.....	<i>Callimome californicum</i> (Ashmead).
<i>Disholcaspis polita</i> Bassett.....	<i>Callimome melanocerae</i> Ashmead.
<i>Disholcaspis rubens</i> Gillette.....	<i>Callimome rubenidis</i> Huber; <i>warreni</i> (Cockerell).
<i>Disholcaspis rugosa</i> (Bassett).....	<i>Callimome racemareae</i> Ashmead.
<i>Disholcaspis simulata</i> Kinsey.....	<i>Callimome californicum</i> (Ashmead).
<i>Disholcaspis sponiosa</i> Karsch.....	<i>Callimome warreni</i> (Cockerell).
<i>Disholcaspis terrestris</i> Weld.....	<i>Callimome melanocerae</i> Ashmead; <i>racemareae</i> Ashmead.
<i>Disholcaspis truckeensis</i> Ashmead.....	<i>Callimome</i> (Ashmead); <i>californicum-subdolum</i> Huber.
<i>Megastigmus</i> , species.....	<i>Callimome amelanchieris</i> (Cushman).
<i>Neuroterus minutissimus</i> Ashmead.....	<i>Callimome neuroterus</i> (Ashmead).
<i>Neuroterus catesbaei</i> (Ashmead) Cresson.....	<i>Callimome dryophantae</i> (Ashmead).
<i>Philonix pezomachoides</i> (Osten Sacken) ..	<i>Callimome brodiei</i> (Ashmead).
<i>Rhodites</i> (<i>Lytorhodites</i>) <i>arefactus</i>	<i>Callimome chrysochlora</i> Osten Sacken.
<i>Rhodites bicolor</i> Harris.....	<i>Callimome bicoloratum</i> Huber.
<i>Rhodites dichloceros</i> (Harris) Osten Sacken	<i>Callimome chrysochlora</i> Osten Sacken.
<i>Rhodites multispinosus</i> Gillette.....	<i>Callimome chrysochlora</i> Osten Sacken.
<i>Rhodites radicum</i> Osten Sacken.....	<i>Callimome flavicorum</i> Osten Sacken; <i>magnificum</i> Osten Sacken.
<i>Rhodites variabilis</i> Bassett.....	<i>Callimome chrysochlora</i> Osten Sacken.
<i>Rhodites</i> , species.....	<i>Callimome rhoditidis</i> Huber.
<i>Rhodites</i> , species.....	<i>Callimome rosae</i> Huber.
Cynipidae.....	<i>Callimome cruentatum</i> Huber.
Cynipidae.....	<i>Callimome gahani</i> Huber.
Cynipidae.....	<i>Callimome hirsutum</i> Huber.
Cynipidae.....	<i>Callimome minutissimum</i> Huber.
Cynipidae.....	<i>Callimome osborni</i> Huber.
<i>Harmolita</i> , species.....	<i>Callimome rohweri</i> Huber.
<i>Harmolita</i> , species.....	<i>Callimome thalassinum</i> (Crosby).

DIPTERA

<i>Asphondylia conspicua</i> Osten Sacken.....	<i>Callimome advenum</i> Osten Sacken.
<i>Asphondylia websteri</i> Felt.....	<i>Callimome hainesi</i> (Ashmead); <i>satirac</i> , new name.
<i>Asphondylia</i> , species.....	<i>Callimome tricolor</i> Huber.
<i>Cecidomyia</i> , species.....	<i>Callimome advenum</i> Osten Sacken.
<i>Cecidomyia</i> , species.....	<i>Callimome koebelei</i> Huber.
<i>Cecidomyia</i> , species.....	<i>Callimome asteridis</i> Huber.
<i>Cecidomyia</i> , species.....	<i>Callimome atriplicis</i> Huber.
<i>Cecidomyia</i> , species.....	<i>Callimome baccharidis</i> Huber.

Host	Parasite
<i>Cecidomyia</i> , species	<i>Callimome capillaceum</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome cecidomyiae</i> Walker.
<i>Cecidomyia</i> , species	<i>Callimome coloradensis</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome dubiosum</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome hircinum</i> Ashmead.
<i>Cecidomyia</i> , species	<i>Callimome kinseyi</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome longistigmum</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome mellipes</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome missouriensis</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome occidentale</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome ochreatum</i> (Say).
<i>Cecidomyia</i> , species	<i>Callimome persimilis</i> (Ashmead).
<i>Cecidomyia</i> , species	<i>Callimome solidaginis</i> Huber.
<i>Cecidomyia</i> , species	<i>Callimome umbilicatum</i> (Gahan).
<i>Cecidomyia</i> , species	<i>Callimome multicolor</i> Huber.
<i>Dasyneura almea</i> Felt	<i>Callimome dasyneurae</i> Huber.
<i>Dasyneurae rosarum</i> Hardy	<i>Callimome sackeni</i> Osten Sacken.
<i>Dasyneurae srrulatae</i> Osten Sacken	<i>Callimome sackeni</i> Osten Sacken.
<i>Diplosis caryae</i> Osten Sacken	<i>Callimome durum</i> Osten Sacken.
<i>Euaesta tricolor</i> Doane	<i>Callimome citripes</i> Huber.
<i>Lasioptera vitis</i> Osten Sacken	<i>Callimome ebrum</i> Osten Sacken.
<i>Lasioptera</i> , species	<i>Callimome capite</i> Huber.
<i>Oedaspes atra</i> Loew	<i>Callimome advenum</i> Osten Sacken.
<i>Rhabdophaga strobiloides</i> Walsh	<i>Callimome strobiloides</i> Huber.

HOMOPTERA

<i>Pachypsylla gemma</i> Riley	<i>Callimome scalaris</i> Huber.
--------------------------------------	----------------------------------

PHYTOPHAGOUS

Seeds (Pyrus)	<i>Callimome druparum</i> (Boheman).
Seeds (Amelanchier)	<i>Callimome prunicola</i> Huber.
Cherry	<i>Callimome prunicola</i> Huber.
Plum	<i>Callimome thompsoni</i> (Fyles).

MISCELLANEOUS

<i>Prosoma</i> , species	<i>Callimome pilularidis</i> Huber.
--------------------------------	-------------------------------------

SPECIFIC CHARACTERS

For specific characters in a group sense, the length of the stigmal vein, the depth of the cross furrow on the scutellum, and the type of punctation on the dorsum are all valuable. In Group A the punctures are very deep and wide in some species, while in others they are very minute. In a few species the thoracic dorsum is entirely reticulate, or reticulato-punctate. The length and type of hair covering are of especial worth in many instances. Two of the very best of structural characters are the comparative length of the joints of the antenna, and the comparative distances between the ocelli, and the ocelli and eye margins. The comparative size of individuals as well as the size and shape of the head, parts of the legs, and the length of the ovipositor are of unquestionable specific worth. It must be

remembered, however, that the very nature of the habits of the parasites may considerably affect their size. It is not unusual to find individuals of the same species two or more times as large as others. The sculpture of the propodeum is also a very valuable character. In many species color alone may be safely used, but in most instances it should be supported by structural differences.

KEY TO THE SPECIES OF CALLIMOME

- | | | |
|---|---------------------------------------|----|
| A. Fossil | No. 1 <i>bruesi</i> Huber. | |
| Not as above | | B |
| B. Females | | 2 |
| Males ⁶ | | 84 |
| 2. Stigmal vein petioled. Group B | | 3 |
| Stigmal vein sessile, sometimes subsessile. Group A | | 37 |
| 3. Scutellum with a readily conspicuous transverse cross furrow on the apical one-third | | 4 |
| Scutellum with cross furrow hardly visible or seen only with difficulty .. | | 8 |
| 4. Fore wings with a conspicuous brown area adjacent to stigmal knob. | | |
| | No. 1a <i>fullawayi</i> Huber. | |
| Fore wings clear, without such a brown area | | 4a |
| 4a. Front femora greatly swollen, almost as wide as the hind femora; legs and scape entirely yellow; propodeum with a median longitudinal depression | No. 2 <i>persimilis</i> (Ashmead). | |
| Front femora normal; coxae never yellow | | 5 |
| 5. Body large, 4 to 5 mm.; ovipositor as long or a little longer than the body; scape brown with tint of green; scutellar apex very highly polished; legs, except coxae and hind femora yellow-tesaceous. | | |
| | No. 3 <i>druparum</i> (Boheman). | |
| Body small, not more than 3 mm | | 6 |
| 6. Thorax and abdomen a distinct brownish bronze; legs, scape, and flagellum a waxy, uniform light brown; funicle joints not much longer than wide, the last two wider than long and almost twice as wide as the first; ovipositor as long as abdomen; cross furrow moderate. | | |
| | No. 4 <i>scalaris</i> Huber. | |
| Thorax green; legs darker and not uniform in color, the scutellar furrow deep; scutellar apex shining | | 7 |
| 7. Hind femora mostly brown with a very slight greenish tinge, coxae and other femora brown; ovipositor about five-sevenths as long as the body; uncus of stigmal vein three-fourths as long as diameter of knob. | | |
| | No. 5 <i>sulcatum</i> Huber. | |
| Hind femora, coxae and abdomen dark green; hind tibiae dark brown; ovipositor same length as abdomen; uncus of stigmal vein longer than the diameter of knob | No. 6 <i>amelanchieris</i> (Cushman). | |
| 8. Sclerite above the tegulae and at the posterior portion of the mesepimeron brassy; thorax greenish-blue | No. 7 <i>rudbeckiae</i> (Ashmead). | |
| Sclerites above tegulae never brassy | | 9 |
| 9. Thorax brilliant blue; abdomen deep, shining, purplish-blue, with an under-shade of violet; scape yellowish-green below, brownish above; last three joints of funicle wider than long; legs and fore coxae honey-yellow, except the base of coxae | No. 8 <i>mellipes</i> Huber. | |
| Not as above | | 10 |

⁶ The males of *ebrium* Osten Sacken, *aereum*, new species, *occidentale*, new species, and *holcaspoideu* (Ashmead) are not included in this key. All other species which are known in the male are included.

10. Thorax ventrally bright yellow..... 11
 Thorax never yellow ventrally..... 12
11. Ovipositor longer than abdomen; mesoscutum greenish.
 No. 9 *ebrium* Osten Sacken.
 Ovipositor one-third as long as abdomen; dorsum with a yellowish to a greenish tint...No. 10 *dubiosum* Huber; No. 11 *durum* Osten Sacken (male only).
12. Head, thorax and abdomen very densely clothed with a fine, silky, grayish pubescence, the abdomen less densely clothed, except at the tip; legs, except the coxae, yellow; ovipositor longer than the abdomen.
 No. 12 *hircinum* (Ashmead).
 Body clothed with hairs but never so densely as above..... 13
13. Abdomen with a very distinct yellow band; coxae yellow, except a green spot on the base, rest of legs and scape yellow; body 3 to 4 mm..... 14
 Abdomen not as above..... 16
14. Ovipositor as long or longer than the body; pedicel and first joint of funicle about equal in length.....No. 13 *flavicoxum* Osten Sacken.
 Ovipositor scarcely longer than abdomen..... 15
15. First joint of funicle almost as long as the pedicel and ring-joint combined; ring-joint about one and one-half times as long as wide.
 No. 14 *fulvum* Huber.
 First joint of funicle a little shorter than the pedicel, all funicle joints of equal length and hardly longer than wide; band on abdomen well defined dorsally.....No. 15 *duplicatum* Huber.
16. Propodeum carinate and roughly sculptured..... 17
 Propodeum not carinate, smooth..... 18
17. Ovipositor as long or just a little longer than the abdomen or about four-sevenths as long as the body, which is 3 mm.; pedicel one-third longer than first joint of funicle.....No. 16 *alamedensis* Huber.
 Ovipositor distinctly shorter than the abdomen and less than one-half as long as the body which is about 3.5 mm.; pedicel and first funicle joint about equal in length.....No. 17 *sackeni* Ashmead.
18. Abdomen very sharply carinate and compressed; antennae black, the scape greenish-black; joints of funicle wider than long except the first; ovipositor shorter than abdomen.....No. 18 *alaskensis* Huber.
 Abdomen and antennae not as above..... 19
19. Head greatly enlarged, one-half as thick as wide and nearly round as seen from the front; thorax very elongate and narrow; ovipositor longer than abdomen.....No. 19 *capite* Huber.
 Head distinctly tranverse..... 20
20. Femora, tibiae and tarsi uniformly dark testaceous, coxae green or greenish-brown; scape never dark brown or green; joints of funicle as wide as long; body normally about 2 mm. long..... 21
 Legs never uniformly dark testaceous..... 23
21. Ovipositor three-fourths as long as abdomen; coxae and abdomen dark green.....No. 20 *ferrugineipes* Huber.
 Ovipositor a little longer than abdomen..... 22
22. Fore coxae brownish, the hind ones darker; abdomen brown with a green tinge.....No. 21 *rhoditidis* Huber.
 Fore coxae yellow, others brown to green; scape pedicel and ring-joint testaceous.....No. 22 *sylicolum* (Ashmead).
23. All joints of funicle distinctly longer than wide..... 24
 Some joints of funicle wider than long..... 29

24. Scape green, brown, or partly brown and partly yellow, never entirely yellow 25
 Scape yellow 28
25. Scape entirely dark green; ovipositor one-third as long as abdomen.
 No. 23 *aeneoscapum* Huber.
 Scape never as above 26
26. Ocellocular line nearly twice the length of the long diameter of posterior ocellus and one-fourth longer than the post ocelli line; femora strongly infusate on outside; scape yellowish beneath.....No. 24 *rosae* Huber.
 Ocellocular line not much more than equal to the length of long diameter of posterior ocellus..... 27
27. Body elongate; abdomen narrow and purplish; ovipositor always longer than the body which is about 4.5 mm.....No. 25 *magnificum* Osten Sacken.
 Body short, robust; abdomen green, the tip often copperish; ovipositor generally shorter than the body which is about 4 mm.
 No. 26 *chrysochlora* Osten Sacken.
 Body narrow and about 4 mm.; abdomen green to golden green.
 No. 27 *tubularis* Huber.
28. Ovipositor a little longer than the body; abdomen purplish; fore coxae greenish-yellow, other coxae green and rest of legs yellow.
 No. 28 *strobiloides* Huber.
 Ovipositor distinctly shorter than the body; abdomen green, fore coxae yellow, other coxae green and rest of legs yellow.
 No. 29 *sapporensis* (Ashmead);
 No. 30 *japonicum* (Ashmead) (male only).
29. Scape entirely yellow; ovipositor never as long as the body and not much longer than abdomen 30
 Scape entirely dark 33
 Scape with the under side yellow, the tip above dark 35
30. Abdomen ferruginous-yellow ventrally; legs, except the hind coxae, yellow; flagellum very black, and the last two or three joints wider than long.
 No. 31 *flaviventre* (Ashmead).
 Abdomen and flagellum never as above 31
31. Hind tibiae infusate in the middle; ovipositor a little longer than the abdomen.....No. 32 *missouriensis* Huber.
 Hind tibiae yellow, not infusate 32
32. Fore coxae orange yellow; scape same color.....No. 33 *asteridis* Huber.
 Fore coxae greenNo. 34 *atriplicis* Huber.
33. Ovipositor about as long as body which is about 3 mm.; dorsum of thorax dark green with a strong reddish-coppery tinge....No. 35 *kinseyi* Huber.
 Ovipositor as long or shorter than abdomen 34
34. Femora and tibiae brown on outside.....No. 36 *pilularidis* Huber.
 Femora and tibiae testaceous.....No. 37 *baccharidis* Huber.
35. None of the joints of funicle longer than wide, the first three about as long as wide; ocellocular line twice the length of the long diameter of posterior ocellus.....No. 38 *longistigmum* Huber.
 Funicle joints not as above, some longer than wide; ocellocular line never twice the length of long diameter of post-ocellus and never much more than as long 36
36. Femora and tibiae testaceous; eyes pinkish.....No. 39 *citripes* Huber.
 Femora and hind tibiae infusate; ocelli maroon.
 No. 40 *coloradensis* Huber.

37. Wings with a dusky area in middle; body 5 mm.; ovipositor longer than body.....No. 41 *perplexum* Huber.
Wings entirely hyaline..... 38
38. Thoracic dorsum minutely sculptured..... 39
Thoracic dorsum with large discoidal punctures..... 68
39. Thorax crimson; abdomen brownish-crimson in some lights; legs light, shining brown.....No. 42 *cruentatum* Huber.
Not as above..... 40
40. First joint of funicle not more than one-half as long as the second..... 41
First funicle joint as long as the second..... 42
41. Ovipositor no longer than abdomen; first joint of funicle one-half as long as the second.....No. 43 *multicolor* Huber.
Ovipositor longer than body; first joint of funicle less than one-half as long as the second; parapsidal furrows hardly apparent.
No. 44 *koebeleri* Huber.
42. Body deep blue with a crimson tint in some lights; parapsidal furrows not well defined; scutellar apex highly polished.....No. 45 *lividum* Ashmead
Body entirely brown except a slight tinge of green; about 2.5 mm..... 43
Body green or some combination of colors..... 45
43. Body elongate; legs uniform, shining, light brown, except that the femora are slightly tinged with purple and the hind coxae highly crimson.
No. 46 *dyrophantae* (Ashmead).
Legs not as above, femora much darker than the tibiae..... 44
44. Thorax very robust; ovipositor shorter than the body.
No. 47 *anthomyiae* (Ashmead).
Thorax elongate; ovipositor as long as the body...No. 48 *aeneum* Ashmead.
45. Scape green or greenish-brown..... 46
Scape generally yellow or testaceous..... 49
46. Ovipositor no longer than abdomen..... 47
Ovipositor as long as or longer than the body..... 67
47. Thorax strongly robust, dark blue and minutely punctate.
No. 49 *dasyneurae* Huber.
Thorax elongate, metallic or bluish green..... 48
48. Thoracic dorsum with transverse, elongate reticulations.
No. 50 *thalassinum* (Crosby).
Thoracic dorsum reticulately-punctate and bluish...No. 51 *rohweri* Huber.
49. Face below the antennae deeply and conspicuously punctured; first joint of funicle two-thirds as long as the second...No. 52 *punctifrons* (Ashmead).
Face and antennae not as above..... 50
50. Joints of funicle all distinctly longer than wide, the first joint about as long or longer than the second..... 51
Joints of funicle not all longer than wide..... 61
51. Body small, not more than 3 mm.; ovipositor generally much longer than body; thorax minutely punctate.....No. 53 *tubicola* Osten Sacken.
Body normally large, seldom smaller than 3.5 mm. and often as much as 5 mm.; joints of funicle of nearly equal width..... 52
52. Ovipositor distinctly longer than the body which is 4-5 mm..... 53
Ovipositor not as long as the body..... 58
53. Margins of parapsidal grooves coarsely sculptured; scutellar apex more finely sculptured than rest of scutellum.....No. 54 *mexicanum* (Ashmead).
Parapsidal grooves not so bordered and the scutellar apex not as above.. 54
54. Body entirely indigo blue; dorsum transversely rugose; femora, tibiae, and scape dark testaceous.....No. 55 *coeruleum* Ashmead.
Body not as above; green or blue..... 55

55. Femora brown, tibiae testaceous; thorax bluish-green.
 No. 56 *castanopsidis* Huber
 Femora green..... 56
56. Thoracic dorsum minutely punctate, slightly reticulated but with no irregularly placed impressions; 5 mm.....No. 57 *giganticum* Huber.
 Thoracic dorsum more conspicuously reticulately punctate, and with large shallow irregularly placed impressions; slightly convex..... 57
57. Scutellar apex punctate; scutellar furrow deep; posterior margin of scutellum golden or brassy.....No. 58 *melanocerae* Ashmead.
 Scutellar apex not punctate; dorsum with numerous and very deep impressions, the area between them decidedly reticulately-rugose.
 No. 59 *coccineum* Huber.
58. Thoracic dorsum distinctly blue and finely punctate; scape and tibiae lemon-yellow; ovipositor as long as head and thorax combined.
 No. 60 *gahani* Huber.
 Thoracic dorsum brownish or greenish; tibiae testaceous..... 59
59. Ovipositor nearly as long as the body.....No. 61 *brodiei* (Ashmead).
 Ovipositor a little longer than the abdomen; thoracic dorsum decidedly bronzed; propodeum coarsely sculptured..... 60
60. Femora dark green.....No. 62 *aereum* Huber.
 Femora blackish brown.....No. 63 *robustum* Huber.
61. Thorax distinctly blue-green, the abdomen dark bronze-brown; scutellar furrow moderately deep, the scutellum about as wide as long; abdomen longer than the thorax.....No. 64 *bicoloratum* Huber.
 Thorax blackish-green, conspicuously robust and clothed with numerous whitish, appressed hairs, the head and abdomen also similarly clothed; femora greenish-brown to dark brown..... 62
 Thorax not blackish-green or clothed with white, appressed hairs..... 64
62. Ovipositor distinctly longer than the body; femora dark greenish-brown, the tibiae dark brown except the tips; scutellar furrow scarcely visible.
 No. 65 *hirsutum* Huber.
 Ovipositor not more than one and one-half times as long as the abdomen..... 63
63. Scutellar furrow moderately defined; hind femora light greenish-brown, tibiae testaceous; vertex of head normal.....No. 66 *capillaceum* Huber.
 Scutellar furrow scarcely defined; tibiae infusate; vertex of head unusually thin; ovipositor scarcely longer than abdomen...No. 67 *hainesi* (Ashmead).
64. Femora and tibiae yellow; ovipositor a little over one-half as long as body.
 No. 68 *tarsale* Huber.
 Femora not yellow..... 65
65. Tibiae yellow.....No. 69 *montserratii* (Crawford).
 Hind tibiae infusate; scutellar furrow well defined...No. 70 *sativae* Huber.
 Hind tibiae brownish-black, the others a little lighter in color; scutellar furrow hardly visible..... 66
66. Thorax with a very decided brassy tinge; scape uniform in color.
 No. 71 *rubenidis* Huber.
 Thorax not tinged as above or very feebly so; scape brownish-green at the tip.....No. 72 *minutissimum* Huber.
67. Body entirely steel-blue; ovipositor longer than the body; parapsidal furrows deep and well defined.....No. 73 *occidentale* Huber.
 Body distinctly green; ovipositor as long as thorax and abdomen combined; parapsidal furrows very poorly defined.....No. 74 *albitarse* Huber.
68. Body large, normally not less than 3.5 mm..... 69
 Body small, normally about 2.5 mm..... 75

69. Body about 5 mm.; crimson-purplish; scutellar apex finely punctuate.
No. 75 *warreni* (Cockerell).
Body not purplish..... 70
70. Body indigo-blue; ovipositor at least one and one-half times as long as the
body which is about 5 mm..... 71
Body green or greenish-golden; never as above..... 72
71. Propodeum rather coarsely sculptured, with large deep pits on the anterior
margin and with a carina; scutellar apex with a more or less striate
sculpture..... No. 76 *racemareae* Ashmead
Propodeum not coarsely sculptured; no carina; scutellar apex minutely sculp-
tured..... No. 77 *cinerosum* Huber.
72. Ovipositor as long as the body..... 73
Ovipositor much longer than the body..... 74
73. Body 3.5 mm.; hair vein originating at stigmal vein and extending back and
upward toward the tip, and consisting of a single row of hairs; femora and
tibiae testaceous..... No. 78 *californicum*, variety *subdolum* Huber.
Body 4.5 mm.; femora blackish, posterior tibiae blackish, except at tips;
abdomen coppery..... No. 79 *maculipenne* (Cameron).⁷
74. Scutellar apex occupying one-third of scutellum; pedicel and ring-joint com-
bined two-thirds as long as first funicle joint; hind femora distinctly bulged
on lower margin beyond the middle and minutely roughened.
No. 80 *californicum* (Ashmead).
Scutellar apex occupying one-fourth of total area of scutellum; hind femora
with lower margin smooth and not bulged.
No. 81 *elegantissimum* Ashmead.
75. Thorax with some shade of purplish-crimson..... 76
Thorax never with a crimson tint..... 78
76. Ovipositor one-third as long as the abdomen..... No. 82 *prunicola* Huber.
Ovipositor longer than the abdomen..... 77
77. Propodeum with a carina..... No. 83 *holcaspoidea* (Ashmead).
Propodeum not carinate; space between the large discoidal punctures finely
reticulate..... No. 84 *solidaginis* Huber.
78. Abdomen mostly yellow; tibiae yellow..... No. 85 *osborni* Huber.
Abdomen with no yellow color..... 79
79. Thoracic dorsum golden-green..... 80
Thoracic dorsum never as above..... 81
80. Joints of funicle all wider than long..... No. 86 *umbilicatum* (Gahan).
Joints of funicle not all wider than long.
No. 87 *rugosipunctatum* (Ashmead).
81. Scutellar apex golden-green, the rest of thorax bluish-green; all tibiae testa-
ceous..... No. 88 *tricolor* Huber.
Scutellar apex not as above and tibiae not all testaceous..... 82
82. Tibiae entirely black..... No. 89 *aztecum* (Cameron).⁷
Tibiae not as above..... 83
83. Scutellum not finely reticulated between punctures; apex of scutellum finely
striate; hind tibiae generally infusate, the others testaceous.
No. 90 *advenum* Osten Sacken.
Scutellum finely reticulated between large punctures; hind tibiae infusate
only at extreme tip..... No. 91 *smithi* (Ashmead).

⁷ Placed from description.

84. Stigmal vein petioled..... 85
 Stigmal vein generally sessile, sometimes subsessile..... 110
85. Furrow on scutellum readily conspicuous 85a
 Furrow on scutellum not easily seen..... 92
- 85a. Fore wings with a faintly marked brown area adjacent to stigmal knob.
 No. 1a *fullawayi* Huber.
 Fore wings not as above..... 86
86. Propodeum smooth and finely reticulate..... 87
 Propodeum very coarsely rugose and blue..... 91
87. Body bronzy brown; last joint of funicle about twice as wide as the first.
 No. 4 *scalaris* Huber.
 Body never brown as above..... 88
88. Scutellar apex highly shining and polished..... 89
 Scutellar apex not highly polished..... 90
89. Coxae and hind femora, except the tips, dark green; rest of legs testaceous;
 length about 3 mm..... No. 3 *druparum* (Boheman);
 Coxae green, the hind femora and hind tibiae infusate and the rest of legs
 honey-yellow; body bluish..... No. 8 *mellipes* Huber.
90. Fore femora greatly enlarged, about as wide but not as long as the hind femora;
 scape yellow ferruginous; propodeum with a longitudinal depression be-
 yond a poorly developed carina; length about 2.25 mm.
 No. 2 *persimilis* (Ashmead).
 Fore femora normal; scape dark-green; propodeum with a depression as
 above; length as above..... No. 6 *amelanchieris* (Cushman).
91. Scape, fore coxae, and rest of legs yellow ferruginous, the tips of scape brown-
 ish; fore coxae sometimes with a greenish tinge at base; about 2.75 mm.
 long..... No. 17 *sackeni* Ashmead.
 Scape brownish; fore coxae yellow with a greenish brown tinge, the legs
 dark testaceous; length about 2.75 mm..... No. 16 *alamedensis* Huber.
92. Body with a very dense and very conspicuous whitish pubescence, the hairs
 a little longer on the pronotum and the posterior of abdomen; scape bright
 green, the femora and tibiae honey yellow; length about 2 mm.
 No. 12 *hircinum* (Ashmead).
 Body never clothed as above..... 93
93. Head round and out of all proportion to size of thorax which is very narrow
 and elongate; length 1.5 mm..... No. 19 *capite* Huber.
 Head transverse and never as above..... 94
94. Abdomen with a yellow band..... 95
 Abdomen without a yellow band..... 96
95. Scape and pedicel yellow-ferruginous, the hind tibiae dark testaceous in the
 middle; sides of pronotum testaceous; length about 2.25 mm.
 No. 15 *duphecatum* Huber.
 Scape brownish at tip; pronotum entirely green; joints of funicle all longer
 than wide; length about 3 mm..... No. 13 *flavicoxum* Osten Sacken.
96. Joints of funicle all longer than wide; scape greenish-brown; legs yellow fer-
 ruginous, except the coxae which are greenish and the hind femora which
 is greenish-brown on the outside and the hind tibiae which are dark testa-
 ceous; length about 2 mm..... No. 37 *baccharidis* Huber.
 Joints of funicle not all long as wide..... 97
97. Scape distinctly yellow beneath and infusate above..... 98
 Scape entirely dark..... 100

98. Antennae with all joints of funicle wider than long; the stigmal vein unusually long..... No. 38 *longistigmum* Huber.
 Joints of funicle not as above, some joints longer than wide..... 99
99. Head and anterior of pronotum decidedly purplish; distance from margin of eye to post-ocellus three-fifths as long as from foraminal margin to post-ocellus; about 3.75 mm. in length..... No. 25 *magnificum* Osten Sacken.
 Head and pronotum not purple; femora and tibiae honey-yellow at tips; distance from eye margin to post-ocellus about equal to the distance from the foraminal margin to post-ocellus; length about 3 mm.
 No. 26 *chrysochlora* Osten Sacken.
100. Fore coxae yellow, or nearly so, and others green..... 101
 All coxae green or brownish-green..... 103
101. First funicle joint nearly one-fourth shorter than the second, and the succeeding four joints not much longer than wide; pedicel as long as first funicle and ring-joint combined; legs testaceous, except the coxae which are dark, and the hind femora and hind tibiae which are brownish in the middle; length about 2 mm..... No. 33 *asteridis* Huber.
 Funicle not as above, the first joint as long as the second..... 102
102. First joint of funicle longer than pedicel and ring-joint combined, most of funicle joints one and one-half time as long as wide; are below the tegulae and posterior mesepimeron brassy..... No. 7 *rudbeckiae* (Ashmead).
 First joint of funicle shorter than pedicel and ring-joint combined; about 2mm. in length..... No. 32 *missouriensis* Huber.
103. Hind femora and hind tibiae infusate, the rest of femora and tibiae yellowish; all joints of funicle wider than long..... No. 21 *rhoditidis* Huber.
 All femora infusate or shining green..... 104
104. Tibiae entirely yellow..... 105
 Some or all of tibiae infusate..... 106
105. All femora dark shining green..... No. 30 *japonicum* (Ashmead).
 All femora light brown in middle..... No. 27 *tubularis* Huber.
106. Hind tibiae infusate, the other tibiae testaceous; hind femora bluish on the outside, the other two more bluish-brown; first four funicle joints distinctly longer than wide; length 1.5 mm..... No. 39 *citripes* Huber.
 All or at least two pairs of tibiae infusate..... 107
107. Head seen from front strongly triangular; none of joints of funicle longer than wide; scape dark green; length about 2.25 mm.
 No. 35 *kinseyi* Huber.
 Head not triangular as above..... 198
108. Pedicel as long as funicle and ring-joint combined; ocellocular line one and one-half times the long diameter of post ocellus; ocelli greyish.
 No. 36 *pilularidis* Huber.
 Pedicel not as long as ring-joint and funicle combined..... 109
109. First joint of funicle distinctly longer than wide.
 No. 40 *coloradensis* Huber.
 First joint of funicle distinctly wider than long and about two-thirds as long as the second joint; length about 2 mm.
 No. 20 *ferrugineipes* Huber.
110. Thoracic dorsum with deep punctures..... 111
 Thoracic dorsum minutely punctate or reticulate..... 120
111. Body normally large, about 3 mm..... 112
 Body small..... 116

112. Body entirely crimson-purple; femora green, tibiae purple with a greenish blue tinge.....No. 75 *warreni* (Cockerell).
Body never as above..... 113
113. Propodeum coarsely sculptured and with carinae; thorax blue, the femora green; first joint of funicle about four times as long as the pedicel and ring-joint combined.....No. 76 *racemareae* Ashmead.
Propydeum feebly rugose, not carinate; first joint of funicle never more than twice as long as pedicel and ring-joint combined 114
114. Flagellum dense black; joints of funicle of equal length; first joint of funicle a little more than twice as long as the pedicel and ring-joint combined; mesoscutum with a decided cupreous tinge.
No. 81 *elegantissimum* Ashmead.
Flagellum brown; first funicle joint never twice as long as the pedicel and ring-joint combined; joints of funicle not of equal length..... 115
115. Vein from the stigmal knob toward the tip and upper margin of wing consisting of a single row of hairs; hind tibiae brown, tinged green, the others infusate.....No. 78 *californicum*, variety *subdolum* Huber.
Vein as above consisting of a double row of hairs; hind tibiae dark testaceous, slightly brownish at tip; other tibiae testaceous.
No. 80 *californicum* (Ashmead).
116. Scape yellow; joints of funicle all longer than wide and of equal width.
No. 85 *osborni* Huber.
Scape dark, brown with purple tinge and slightly ferruginous at base; joints of funicle wider than long.....No. 84 *solidaginis* Huber.
117. Thoracic dorsum golden-green; hind tibiae infusate, the others and the scape testaceous.....No. 87 *rugospunctatum* (Ashmead).
Thoracic dorsum never golden-green..... 118
118. Hind femora dark, shining blue-green, the other femora and hind tibiae deeply infusate, the mid and fore tibiae and the scape brownish-yellow; abdomen normally with a violaceous tinge.....No. 88 *tricolor* Huber.
Hind femora not as above; abdomen greenish or bluish..... 119
119. Body greenish; femora and tibiae blackish-brown; scape with a greenish-brown lustre.....No. 86 *umbilicatum* (Gahan).
Thorax blue with a strong undershade of brown; femora and tibiae light brown.....No. 90 *advenum* Osten Sacken.
120. Head and thorax strongly crimson with an undershade of brown; abdomen about same; scape light brown; length about 2 mm.
No. 42 *cruentatum* Huber.
Entire body dark brown except the tarsi which are whitish; length, 1.5 mm.
No. 48 *acneum* Ashmead.
Body never brown or crimson as above..... 121
121. Joints of funicle all distinctly longer than wide 122
Joints of funicle not all distinctly longer than wide 130
122. Body dark indigo-blue or purplish with slight tinge of green in some lights; scape testaceous; tibiae testaceous.....No. 55 *coeruleum* Ashmead.
Body not indigo-blue or purplish..... 123
123. Margins of parapsidal furrows with large irregularly elongate indentations; thorax green with a bronzy tinge dorsally; scape ferruginous, the tibiae slightly infusate.....No. 54 *mexicanum* (Ashmead).
Parapsidal furrows not margined as above..... 124

124. Scape dark brown, brownish-green or green..... 125
 Scape yellow-ferruginous 128
125. Tibiae greenish-brown No. 57 *giganticum* Huber.
 Tibiae yellow-ferruginous..... 126
126. Thoracic dorsum bronzish-green; veins of wings yellow; stigmal vein sub-
 sessile..... No. 61 *brodiei* (Ashmead).
 Thoracic dorsum dark bluish or bluish green..... 127
127. Eyes dark brown the ocelli maroon; thorax mostly green; the ocellocular
 line slightly longer than the lateral ocellar line and about as long as the
 diameter of mid-ocellus..... No. 56 *castanopsidis* Huber.
 Eyes pinkish and ocelli transparent; thorax blue; ocellocular line one and
 one-fifth times the diameter of mid-ocellus; post ocellar line distinctly
 shorter than the diameter of mid-ocellus..... No. 60 *gahani* Huber.
128. Body large normally 4 mm. or more; femora dark greenish-brown, tibiae
 dark testaceous and infusate..... No. 58 *melanocerae* Ashmead.
 Body small not more than 2 mm..... 129
129. Thoracic dorsum clothed with white appressed hairs. No. 65 *hirsutum* Huber.
 Thoracic dorsum not clothed as above; all joints of funicle longer than
 wide but the last one very slightly so.... No. 53 *tubicola* Osten Sacken.
130. Thorax blackish and clothed with white appressed hairs; scutellar furrow
 scarcely defined No. 67 *hainesi* (Ashmead).
 Thorax not conspicuously clothed with white appressed hairs..... 131
131. Scape ferruginous or nearly so 132
 Scape dark greenish-brown or other dark shade 134
132. Thoracic dorsum reticulated, shining green; legs brown, the femora dark;
 last two joints of funicle not as long as wide.... No. 68 *tarsale* Huber.
 Thoracic dorsum reticulately punctate or punctate 133
133. Scutellar furrow distinct; femora and hind tibiae blackish-brown, the other
 femora infusate; thorax bluish..... No. 64 *bicoloratum* Huber.
 Scutellar furrow scarcely seen; legs a light and uniform brown; thorax green-
 ish and very robust..... No. 69 *montserrati* (Crawford)
134. Body purplish-blue; scape testaceous with a slight bluish tinge.
 No. 49 *dasyneurae* Huber.
 Body not purplish-blue..... 135
135. Some of joints of funicle, the first at least, longer than wide.
 No. 71 *rubenidis* Huber.
 Joints of funicle all wider than long; scape green..... 136
136. Parapsidal furrows scarcely perceptible..... 137
 Parapsidal furrows deep..... 138
137. Scutellar apex highly polished No. 92 *neuroterum* (Ashmead).
 Scutellar apex not polished..... No. 44 *koebeliei* Huber.
138. Thorax moderately robust, the dorsum reticulately punctate; and clothed
 rather densely with whitish hairs; scutellar furrow scarcely apparent.
 No. 70 *sativae* Huber.
 Thorax decidedly elongate and reticulate and more or less shining; scutel-
 lar furrow deep 139
139. Lateral ocellar line one and one-third times as long as the ocellocular; coxae
 and femora shining green, hind tibiae greenish-brown, the others infus-
 cate; ocelli maroon..... No. 50 *thalassinum* (Crosby).
 Lateral ocellar line about equal to the ocellocular line; legs brownish; ocelli
 and eyes brownish..... No. 51 *rohweri* Huber.

DESCRIPTION OF SPECIES

1. CALLIMOME BRUESI, new name

Torymus sackeni BRUES, Bull. Mus. Comp. Zool., vol. 54, 1910, No. 1, p. 17, not *Callimome sackeni* Ashmead.

Type locality.—Florissant, Colorado (No. 12869, S. H. Scudder, Coll.).

Type.—No. 2063, Museum of Comparative Zoölogy.

This species is the only known fossil representative of the genus *Callimome* Spinola. Brues has placed it here primarily because of its close resemblance to *Callimome magnificum* Osten Sacken.

1a. CALLIMOME FULLAWAYI, new name

Syntomaspis coerulea FULLAWAY, Journ. New York Ent. Soc., vol. 20, 1912, p. 274, preoccupied by *Callimome coerulea* Ashmead.

Type locality.—California.

Host.—*Callirhytis agrifoliae* (Bassett).

Type.—Collection of Leland Stanford Junior University (lot 499, S. 3).

The type material of this species has not been available for study. I have, however, examined six specimens reared from the same host as the type and determined as this species by A. B. Gahan. These specimens are recorded under Bureau of Entomology number Hopkins U. S. 15922^f collected at Los Gatos, Calif., on *Quercus chrysolepis* by R. D. Hartman and Hopkins U. S. 12561^e collected at Ashmead, Oreg., on *Quercus californicus* by J. M. Miller. I find that these specimens agree well with the description referred to above. I am not satisfied that this species is a true *Callimome* due to the fact that the hind femur is somewhat serrate and has a distinct tooth. On the other hand, it shows many characteristics of a *Callimome*. For the present it has been retained in the group where it was originally placed.

2. CALLIMOME PERSIMILIS (Ashmead)

Figure 66

Torymus persimilis ASHMEAD, Trans. Amer. Ent. Soc., vol. 21, 1894, p. 334.

Female.—Length 3 mm.; ovipositor 2 mm. Thorax green; the front femora greatly enlarged. Head rather robust and wider than long; viewed from the front more or less oval and greenish with a prominent shade of brown which in some lights gives a brassy tinge; face minutely sculptured, clothed with feeble whitish hairs and with a strongly developed carina, which is entirely green; scape honey yellow on the underside and brownish on the upper side; flagellum light brown; the pedicel and first joint of funicle equal; ring-joint one and one-half times as long as wide; joints of funicle gradually growing shorter and somewhat wider toward the tip; antennal depression very shallow, the median ocellus within its apex. Thoracic dorsum

with a strong under shade of brown; pronotum, just behind the juncture with the head, with a transversely rugose area that is smoother than the posterior part; remainder of dorsum minutely reticulately rugose with numerous shallow impressions which are most numerous on the scutellum just on each side of the middle; scutellum with a well-defined cross furrow, the area behind the furrow not so deeply sculptured as before it; propodeum rather widely but not deeply punctured and with a longitudinal impression beginning at the center of the anterior margin and extending back about three-fourths the length of the propodeum; fore coxae entirely yellow; mid coxae yellow, except for a green spot near the base; the hind coxae yellow at the tips only, brown underneath and greenish-brown above; rest of legs entirely yellow, the tarsi light yellow; front femora much swollen, almost as wide as the hind femora; wings with stigmal vein petioled. Abdomen very slender; antero-dorsally light, yellowish-brown, the rest brown with a tinge of green and a cupreous reflection in some lights.

Male.—Length 2.25 mm. Darker than the female. Scape yellow ferruginous; flagellum brown ferruginous. Otherwise similar to female.

Type locality.—Morgantown, W. Va.

Host.—Cecidomyid gall on willow.

Type.—Cat. No. 25356, U.S.N.M.

The female is redescribed from one type specimen collected by A. D. Hopkins May 1, 1891. The male is described for the first time from a series of 10 males and 6 females deposited in the National collection and bearing the number 166OL; a single label indicates that they were reared from a Cecidomyid gall on willow. No data under the above number are obtainable.

3. CALLIMOME DRUPARUM (Boheman)

Figure 43

Torymus druparum BOHEMAN, Svensk. Vet. Akad. Handl., vol. 54, 1833, p. 361, No. 24.

Syntomaspis druparum (Boheman) MOKRZECKI, Zeitschr. wiss. Insektb., vol. 2, 1906 p. 309-92.—CROSBY, Bull. 265, Cornell Agr. Exp. Sta., 1909, p. 369.—CUSHMAN, Journ. Agr. Res., vol. 7, 1916, p. 487.—GAHAN, Proc. Ent. Soc. Wash., vol. 24, No. 2, Feb., 1922.

Type locality.—Europe, Suecia.

Host.—"Seeds of apple (*Pyrus*) and of Mountain ash (*Sorbus*) in Europe and North America." Gahan, 1922. Also *Malus* and *Crataegus*, Wellhouse, W. H. Insect Fauna of the Genus *Crataegus*, Cornell University Agricultural Experiment Station Memorandum 56, June, 1922, page 1131.

Distribution.—Many specimens in the National collection reared by R. A. Cushman from apple seeds collected at Orwell, Vt., and

recorded under Quaintance No. 10901. Also 20 specimens F. H. B. 587 quarantine, New York, from seeds of *Pyrus malus* (Hill) Gray, Vienna, Austria, collected by D. G. Tower. Two of the first-named specimens are in the author's collection.

4. CALLIMOME SCALARIS, new species

Figure 98

Female.—Length 2.3 mm.; ovipositor 1.5 mm. Body bronze. Head decidedly wider than the thorax and not strongly transverse; viewed from the front clothed with white appressed hairs that are longest below the antennae; carina, below the antennae, extending hardly half the distance to the margin of the mouth; scape fuscous and inserted just a little below the middle of the head; the flagellum rather dark brown; pedicel longer than the first funicle and ring-joint combined and one-third wider than the funicle joint; ring-joint longer than wide; joints of funicle gradually increasing in width toward the tip, the last funicle joint twice as wide as the first, and subequal in width to first joint of club; funicle clothed with short, bristly hairs; ocelli ferruginous; the ocellocular line a little longer than the lateral ocellar line. Thoracic dorsum reticulately punctate, the reticulated areas appearing scalelike and shining; clothed with long, silky white hairs; parapsidal furrows moderately deep; scutellar cross furrows almost imperceptible; scutellar apex not so deeply sculptured as rest of scutellum and hence somewhat shining; propodeum finely reticulated; coxae same color as body, except the tips are lighter; femora and tibiae uniform light shining brown, the tibiae yellowish-brown inside and at tips, the last joint of tarsi brownish; wings strongly ciliate, veins yellowish-brown, marginal vein two-thirds as long as submarginal, and the stigmal vein petioled. Abdomen longer than the thorax, but not as long as the head and thorax combined; rather strongly depressed dorsally; the antero-dorsal area ferruginous; tergites medially emarginate; ovipositor a little longer than the abdomen.

Male.—Length 1.75 mm. Head greenish-brown with a cupreous tinge on the face; the pedicel not as long as the first funicle joint and ring-joint combined. Thorax dark green with a brownish tinge; coxae, femora, and tibiae dark brown. Abdomen longer than the thorax. Otherwise similar to the female.

Type locality.—Arizona.

Host.—*Pachypsylla gemma* Riley on *Celtis*, species.

Type.—Cat. No. 25352, U.S.N.M.

Described from seven females and three males. The type female, male allotype, and six paratypes are in the National collection.

Distribution.—Three females and one male under Bureau of Entomology No. 371° reared March 5, 1888, from material collected in Arizona by P. T. Baron. Six specimens reared February 14, 1888,

from material collected in Alameda County, Calif., and recorded under the same lot number as above. Two of the latter are in the author's collection.

5. *CALLIMOME SULCATUM*, new species

Figure 94

Female.—Length 2 mm.; ovipositor 1.8 mm. Dark shining green, robust, the scutellum with a deep cross furrow. Head transverse and as wide as the thorax; viewed from the front, green with a golden tinge below the antennae; face reticulately-rugose and with a rather prominent carina; scape mostly brown, but yellow ferruginous beneath; flagellum brown; pedicel as long as the first joint of funicle; funicle joints, except the first two, as wide or wider than long; ring-joint wider than long; ocellular line about one and one-half times the diameter of the ocellus. Thoracic dorsum wide, short and strongly arched; furrows well defined; transversely rugose with a few shallow irregularly placed impressions; reticulate punctures on the scutellum more shallow than on the mesoscutum; the scutellar cross furrow very deep and the apex of the scutellum shining; mesepimeron brown, except the posterior part, which is dark green; propodeum smooth, feebly reticulated; coxae greenish-brown; femora greenish-brown in the middle, the hind ones very dark; fore and mid tibiae ferruginous, the hind ones infuscate, except the tips; tarsi yellow ferruginous; wings strongly ciliate, veins pale brown, marginal vein four-sevenths as long as submarginal. Abdomen brownish-green and about as long as the thorax; ovipositor more than twice as long as abdomen.

Male.—Unknown.

Type locality.—Donner, Calif.

Host.—Cynipid gall on *Quercus pumila* Walter.*

Type.—Cat. No. 25349, U.S.N.M.

Described from two females reared January 21 to February 1, 1886, and recorded under Bureau of Entomology No. 3770; collected by A. Koebele. The types are deposited in the National collection.

6. *CALLIMOME AMELANCHIERIS* (Cushman)

Figure 52

Syntomaspis amelanchieris CUSHMAN, Proc. Ent. Soc. Washington, vol. 19, 1918, pp. 82-83.

Type locality.—North East, Pa.

Host.—Seeds of *Amelanchier canadensis* (Linnaeus) Medicus.

Type.—Cat. No. 20968, U.S.N.M.

Distribution.—Besides the type locality mentioned above this species has been reared from the above-named seeds collected by C. R. Cutright at Pickens, W. Va. Mr. Cushman reports that this species is doubtfully phytophagous, or at least it is sometimes parasitic on a species of *Megastigmus*.

* The species of oak mentioned above is not known to occur in California.

7. CALLIMOME RUDBECKIAE (Ashmead)

Figure 97

Torymus rudbeckiae ASHMEAD, Bull. Colorado Biol. Assoc., vol. 1, 1890, p. 26.

The original description follows:

Female.—Length 2.8–3.6 mm; ovipositor about 2 mm. Blue, closely, finely punctate, the mesonotum a little rugulose, lower part of face green. Antennae black, scape beneath pale yellow. Parapsides distinct, but not sharply defined, the lateral lobes are not very convex, the middle lobe being about two and one-half times as long as wide. At base of insertion of anterior wings and on the metapleurae are bright, polished, cupreous spots. Legs yellow-ferruginous, all tarsi pale, the hind tibiae fuscous. Abdomen about as long as the head and thorax together, subcompressed, blue, with some greenish tings at apex, the sides of segments with sparse long hairs, and with a microscopical wavy sculpture. Wings hyaline; tegulae and submarginal vein yellowish, other veins brown; the marginal vein is about thrice as long as the postmarginal, the stigmal short with a prominent hook.

Male.—In the male the legs are waxy-yellow, the antennal scape very short, flagellum much stouter, longer and cylindrical, dorsum of abdomen concave at base; otherwise as in female.

The stigmal vein of the wing in this species is petioled; the scutellar cross furrow is not readily conspicuous; in the female the mid and hind coxae are green, the tarsi whitish, except the last two joints, which are brown; the scape of the male is dark, brownish-green, and the flagellum brown in both sexes.

Type locality.—West Cliff, Colo.

Host.—Gall on *Rudbeckia*, species.

Type.—Cat. No. 25353 U.S.N.M.

This species was taken by T. D. A. Cockerell. It was described from one male allotype and one female type. Besides the type series there is a female and a male from the type locality in the National collection.

8. CALLIMOME MELLIPES, new species

Figure 65

Very easily separated from all others by the color of the legs and the unique type of thoracic sculpture.

Female.—Length 2.6 mm.; ovipositor 1.3 mm. Thorax bluish purple with a tint of green in some lights; abdomen shining, violaceous-purple. Head same color as the thorax; minutely reticulated and with conspicuous widely separated punctures; scape lemon yellow beneath and brown above; the flagellum brown; pedicel as long as the first joint of funicle; all joints of the funicle after the third wider than long and gradually growing wider toward the tip; eyes brownish. Thoracic dorsum with a sculpture that is very definite, the reticulations being more or less regular in form and seemingly flattened; the surface smoother and the reticulations more clearly defined on the

scutellum; all the dorsum with shallow and irregularly placed impressions, except the central one-third of the scutellum; scutellar cross furrow indicated only by the shining scutellar apex which is more finely reticulated; propodeum green with a bluish tint; the anterior margin of the propodeum punctate; veins of wings and tegulae honey yellow; the stigmal vein petioled; fore coxae brownish at the base, otherwise yellow; mid and hind coxae green, the rest of the legs light yellow, except the tips of tarsi which are brown.

Male.—Green with a purple reflection; scape dark brown.

Type locality.—Jamaica Plain, Mass.

Host.—Cecidomyid gall on *Populus*, species.

Type.—Cat. No. 25350, U.S.N.M.

Described from one female reared March 30, 1885, and one male reared March 24, 1885, from galls collected by Miss C. H. Clark and recorded under Bureau of Entomology, No. 3622°. Both specimens are deposited in the National collection.

9. *CALLIMOME EBRIUM* Osten Sacken

Figure 60

Callimome ebria OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 3, 1870, p. 58, No. 1.

Torymus ebrius (Osten Sacken) DALLA TORRE, Cat. Hymen., vol. 5, 1898, p. 304.

Type locality.—Washington, D. C.

Host.—*Lasioptera vitis* Osten Sacken on grape.

Type.—Cambridge Museum of Comparative Zoology.

This species was described from one male and two females.

Distribution.—There are specimens in the National collection labeled as follows: Two specimens under Hopkins No. 12071, reared June 29, 1914, from a Dipterous gall on wild grape collection by William Middleton at Falls Church, Va. One specimen reared June 18, 1881, from *Lasioptera vitis* Osten Sacken and bearing No. 938a. One specimen, Hunter No. 1278, reared May 19, 1906, from a Bud grape gall by W. D. Hunter, San Antonio, Tex. In the author's collection there are two specimens reared from *Lasioptera vitis* Osten Sacken on wild grape collected near Columbus, Ohio.

10. *CALLIMOME DUBIOSUM*, new species

Figure 49

Closely resembles *Callimome ebrium* Osten Sacken from which it is readily separated. There is a possibility that this species may prove to be identical with *Callimome durum* Osten Sacken, the female of which was not described; the rearing of both sexes from the same host will aid in establishing the true status of the species.

Female.—Length 2.25 mm.; ovipositor 3 mm. Body yellowish, except the head which is greenish and the abdomen which is brownish. Head transverse and decidedly wider than the thorax; face

moderately reticulately rugose, and the area below the antennae clothed with long white hairs; carina prominent below the antennal groove which is very shallow; scape entirely yellow; pedicel infusate in middle, yellowish at tips, the rest of flageullm brown and densely pubescent; ring-joint more than twice as wide as long; the joints of the funicle all distinctly longer than wide, except the last two which are very little longer than wide, and all gradually increasing in width toward the tip; ocelli reddish. Thoracic dorsum minutely rugose, mostly yellow, but with a faint tinge of green which is most prominent on the pronotum; parapsidal furrows distinct; scutellar apex more finely sculptured than rest of scutellum; propodeum green, except at the margins; mesepimeron with a green spot posteriorly; legs and ventral portion of thorax bright yellow; wings strongly ciliate, veins pale brown; marginal vein not quite five-sevenths as long as submarginal, the stigmal vein petiolate. Abdomen shorter than the thorax and rather robust; a yellow spot near the middle dorsally; ventrally light brown to yellow ferruginous; ovipositor less than one-third as long as the abdomen.

Male.—Unknown.

Type locality.—Washington, D. C. (?)

Host.—Hickory gall on under side of leaf.

Type.—Cat. No. 25399, U.S.N.M.

Described from four females recorded under Bureau of Entomology number 252L^o and reared May 2, 1824, by O. Luggler. The type and two paratypes are deposited in the National collection. One paratype is in the author's collection.

The greenish tinge of the thoracic dorsum is subject to considerable variation; some specimens are more distinctly yellow than others.

11. CALLIMOME DURUM Osten Sacken

Callimome dura OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 3, 1870, p. 59, No. 2.

Type locality.—Washington, D. C. (?)

Host.—*Diplosis caryae* Osten Sacken.

Type.—Cambridge Museum of Comparative Zoölogy.

12. CALLIMOME HIRCINUM (Ashmead)

Figure 71

Torymus hircinus Ashmead, Trans. Amer. Ent. Soc., vol. 21, 1894, p. 333.

Type locality.—Morgantown, W. Va.

Host.—Twig gall on willow.

Type.—Cat. No. 25360, U.S.N.M.

This species is represented in the National collection by one male (selected as allotype) and one female (type), collected by A. D. Hopkins.

The pubescence of *Callimome hircinum* (Ashmead) is so unique and unusual that a redescription is not necessary. Both type specimens are well preserved.

13. *CALLIMOME FLAVICOXUM* Osten Sacken

Figure 46

Callimome flavicoxa OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 3, 1870, p. 61; No. 4.

Torymus flavicoxa (Osten Sacken) DALLA TORRE, Cat. Hymen., vol. 5, 1898, p. 305.

Type locality.—Presumably Connecticut.

Host.—*Rhodites radicum* Osten Sacken.

Type.—In the Cambridge Museum of Comparative Zoölogy.

This species was described from several specimens.

Distribution.—Connecticut (?). The following are in the National collection: Seven specimens Hopkins No. 11349, reared April 14 to June 3, 1913, from *Diastrophus nebulosus* Osten Sacken at Minor's Hill, Falls Church, Va., collected by William Middleton. Two specimens Hopkins No. 11332, reared June 12, 1913, from *Diastrophus nebulosus* Osten Sacken. Some miscellaneous specimens from New Jersey and Waterbury, Conn. Four specimens reared by E. R. Sasser, April 29, 1906, at Washington, D. C. Two specimens reared by A. C. Kinsey from *Diastrophus nebulosus* Osten Sacken at Forest Hill, Mass., are in the author's collection.

14. *CALLIMOME FULVUM*, new species

Figure 47

Resembles *Callimome flavicoxum* Osten Sacken and *Callimome duplicatum*, new species, in the color markings of the abdomen, but is separated from the former by the length of the ovipositor, and from the latter by its larger size and antennal characters as mentioned in the key.

Female.—Length, 4.5 mm.; ovipositor about as long as abdomen. Thorax greenish, the abdomen flavo-testaceous to brownish. Head transverse and very much wider than the thorax, entirely violaceous-crimson and cupreous in some lights; face minutely reticulated but with numerous, irregularly scattered, impressions and clothed sparsely with feeble white hairs; facial carina broad, extending two-thirds the distance to the margin of the mouth; scape yellowish and long, attaining level of median ocellus; pedicel and ring-joint brunneous, the former equal in length to the second joint of funicle, but very distinctly shorter than the first joint of funicle, which is narrowed at the base; ring-joint a little longer than its width at base; last joint of funicle just a little longer than wide, the club longer than the last two funicle joints combined; funicle and club black, each joint with

two rows of short whitish hairs; ocelli amber, eyes pinkish-brown. Pronotum cupreous with a purplish tint just back of juncture with the head, and with a cupreous band on the posterior margin; meso-scutum rather coarsely reticulated, the scutellum more finely so, but both with numerous, round and irregularly scattered impressions which are most apparent on the scutellum; entire dorsum with a slight cupreous reflection; propodeum with large reticulations, but not deep, the grooves transverse in center and longitudinal on the sides; spiracles prominent, the area around them coppery; both the anterior and posterior margin of propodeum with large pits; fore and mid coxae entirely yellow, the hind coxae yellow, except for about one-fifth of the base, which is green shading into brown; rest of legs yellow; wings strongly ciliated, veins pale brown; the marginal vein seven-tenths as long as submarginal, the stigmal vein petioled. Abdomen yellow testaceous, except the posterior one-third, which is brown; strongly compressed, carinate dorsally; tergites emarginate; sheath of ovipositor thicker than the basal joint of hind tarsi.

Male.—Unknown.

Type locality.—Nebraska.

Host.—Unknown.

Type.—Cat. No. 25397, U.S.N.M.

Described from one female. This specimen was associated in the National collection with *Callimome flaviventre* (Ashmead).

15. CALLIMOME DUPLICATUM, new species

Figure 55

Closely allied to *Callimome flavicozum* Osten Sacken, but is separated by characters indicated in the key.

Female.—Length 3 mm.; ovipositor 1.2 mm. Thorax green, the abdomen brownish with a rather wide yellow band dorsally. Head transverse, the face reticulately punctate and clothed sparsely with fine hairs; scape long, slender and pale ferruginous, the tips on upper side slightly brown; pedicel ferruginous, the ring-joint darker and about as long as wide; funicle dark brown, each joint clothed with two rows of widely separated and regularly arranged yellowish hairs in addition to a finer type of pubescence; first four funicle joints distinctly longer than wide, the succeeding joints a very little longer to not as long as wide; pedicel very slightly longer than first joint of funicle; vertex more coarsely punctate than the face and with a crimson tinge in some lights; ocelli amber; post ocellar line twice the length of the lateral ocellar line and two-thirds the length of the distance between the post ocelli. Thoracic dorsum moderately rugose; posterior margin of pronotum highly shining and cupreous, the sides yellow-ferruginous; scutellar cross furrow conspicuous at certain angles; anterior of scutellum more finely punctate than the

mesoscutum; scutellar apex not so deeply punctate and hence appearing somewhat polished; propodeum and metanotum steel-blue, the former moderately longitudinally reticulated; legs, except the bases of hind coxae which are green, entirely yellow ferruginous, the tarsi paler; wings strongly ciliate, veins dark yellow; marginal vein three-fourths as long as submarginal, the stigmal vein petioled. Abdomen as long as thorax, five-sixths as wide and much flattened dorsally; antero-dorsally with a brown spot about the width of hind femora, the remaining of abdomen yellow ferruginous, except a dark brown area dorsally that extends from the tip of abdomen to the middle; ovipositor as long as abdomen.

Male.—Length 2.5 mm. Funicle joints, except the first two, about as wide or wider than long. Otherwise about same as female.

Type locality.—Chagrin Falls, Ohio.

Host.—*Diastrophus cuscutaeformis* Osten Sacken on *Rubus*, species.

Type.—Cat. No. 25362, U.S.N.M.

Described from seven females and three males recorded under Bureau of Entomology No. 6635° and reared May 18, 1895, from material collected in the type locality by A. R. Phillips. Besides the series from the type locality the National collection contains one female from Waterbury, Conn., and also one female recorded under Hopkins No. 13606 reared June, 28, 1915, from galls of *Diastrophus cuscutaeformis* Osten Sacken on *Rubus*, species collected by Wm. Middleton at Falls Church, Va. A paratype from the type locality in the collection of the author.

18. *CALLIMOME ALAMEDENSIS*, new species

Figure 48

Very closely allied to *Callimome sackeni* Ashmead but is smaller, not so robust, has a longer ovipositor and some different antennal characters as already indicated.

Female.—Length 3.5 mm; ovipositor 2 mm. Thorax bluish-green, the abdomen green with a strong cupreous reflection posteriorly. Head as wide as the thorax; viewed from the front green with a slight cupreous tinge and sparsely clothed with short white hairs; carina, below the antennae, very low and wide; scape yellow ferruginous, except the tip above which shows brown; flagellum black, the pedicel and ring-joint brownish-black; pedicel longer than the first funicle joint; the ring-joint as long as wide; first three joints of funicle a little longer than wide, the rest wider than long and all clothed sparsely with white hairs; vertex cupreous and more coarsely sculptured; postocellar line one and one-half times the long diameter of an ocellus. Thoracic dorsum moderately reticulately rugose and with numerous shallow pits; scutellum with a purplish line extending from the anterior margin to a point about two-thirds the distance posteriorly; posterior one-fourth of scutellum with a distinct

cross furrow; the scutellar apex somewhat polished, more conspicuously so than *sackeni*; propodeum deeply sculptured and shagreened through the median one-third, the lateral one-third being sculptured more nearly as the dorsum; fore coxae yellow testaceous but with a distinct greenish tint on the basal one-third; mid coxae green with a bronzy reflection, the hind coxae green at the base and the tip but with a purple hue through the center, the tip testaceous; femora and tibiae dark testaceous; the tarsi testaceous stigmal vein petioled. First segment of abdomen bronzy green; posterior part of abdomen decidedly cupreous; ovipositor about one-fifth longer than the abdomen.

Male.—Length 2.75 mm. Scape yellowish beneath and mostly dark green above; joints of funicle about as long as wide and of nearly equal width; fore coxae not so yellow as in female, legs pale testaceous, the tips of joints yellowish. Abdomen shorter than the thorax.

Type locality.—Alameda, Calif.

Host.—Gall on "currant."

Type.—Cat. No. 25358, U.S.N.M.

Distribution.—Described from 16 females and 9 males reared May, 1888, from the above-named host and recorded under Bureau of Entomology No. 399^o; and from 9 specimens Hopkins No. 11059a¹ reared by B. T. Harvey from galls on *Rubus nutkanus* Mocino, at Necanicum, Oreg., May 2, 1913. Two paratypes from the first named series are in the author's collection.

17. CALLIMOME SACKENI Ashmead

Figure 164

Callimome brevicauda OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 3, 1870, p. 62, No. 6, not *Callimome brevicauda* Walker.

Callimome sackeni ASHMEAD, Trans. Amer. Ent. Soc., vol. 9, 1888, Proc., p. xxxiii (new name for *brevicauda* Osten Sacken).

Callimome brevissimicauda ASHMEAD Trans. Amer. Ent. Soc., vol. 9, 1888, Proc., p. xxxiii.

Callimome fagopyrum PROVANCHER, Nat. Can., vol. 12, 1881, p. 291.

Callimome virentis ASHMEAD, Trans. Amer. Ent. Soc., vol. 9, 1881, Proc., p. xxxiv.

Torymus virentis (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 188.

Torymus brevicauda (Osten Sacken) ASHMEAD, Trans. Amer. Ent., vol. 14, 1887, p. 188.

Torymus brevissimicauda (Ashmead) DALLA TORRE, Cat. Hymen., vol. 5, 1898, p. 301.

Torymus ostensackeni DALLA TORRE, Cat. Hymen., vol. 5, 1898, p. 311 (new name for *brevicauda* Osten Sacken).

Female.—Length 3.5 mm.; ovipositor 1.2 mm. Thorax green and robust; abdomen cupreous. Head transverse; viewed from front reticulately rugose, green with a cupreous tinge; carina separating the

antennae and extending three-fourths the distance to margin of clypeus; scape yellow, the flagellum brown; pedicel a little longer than the first funicle joint and the ring-joint a little wider than long; first four joints of funicle slightly longer than wide, the succeeding ones wider than long, and all clothed with brownish hairs; ocellular line about one and one-fifth times the length of the long diameter of posterior ocellus and also longer than the lateral ocellar line; ocelli pink, the eyes red. Thorax green but with cupreous and purple tints in some lights; scutellar cross-furrow quite conspicuous at certain angles and the sculpture a little coarser behind it; metanotum very coarsely rugose and with a distinct bluish tinge; fore coxae yellow with a green spot at the base, the mid coxae greenish-yellow, the hind coxae green but with a yellow tip; rest of legs yellow-ferruginous; stigmal veins of wings petioled. Abdomen robust, ovate as seen from above and two-thirds as long as thorax; bluish with a purple tint antero-dorsally, the posterior half with a cupreous reflection; ovipositor about as long as abdomen.

The type of this species is *Callimome brevicauda* Osten Sacken. It is redescribed here from two female paratypes recently received in exchange by the United States National Museum from the Museum of Comparative Zoölogy.

Male.—Length 2.75 mm. Scape and legs yellow ferruginous; eyes maroon; joints of funicle proportionately wider than in female; mid coxae green.

Type locality.—Not certain.

Host.—*Diastrophus nebulosus* Osten Sacken.

Paratype of brevicauda Osten Sacken.—Cat. No. 25389, U.S.N.M.

Type of brevicauda Osten Sacken.—Museum of Comparative Zoölogy, No. 813.

The male allotype is described from one of several specimens recorded under Hopkins No. 11332 and reared April 22, 1913, from *Diastrophus nebulosus* Osten Sacken, on *Rubus*, species, and collected by William Middleton at Falls Church, Va.

Distribution.—The national collection contains the following: Three specimens of *Callimome brevissimicauda* Ashmead. Type, Cat. No. 1359, U.S.N.M. reared from *Diastrophus nebulosus* Osten Sacken, on *Rubus*, species, Jacksonville, Fla. Two females of *Callimome virentis* Ashmead Type; Cat. No. 2838, U.S.N.M., reared from *Andricus virens* on live oak, Jacksonville, Fla. Nine specimens, Hopkins No. 11349, reared April 7 to June 13, 1913, from *Diastrophus nebulosus* Osten Sacken, on *Rubus*, species, Falls Church, Va., William Middleton, collector. Eighteen specimens, Hopkins No. 11332, reared April 13 to June 13, 1913, with data as above. Fourteen specimens recorded under Bureau of Entomology No. 3270, August 5, 1884. Three specimens reared from *Diastrophus turgidus* Bassett, Toronto, Canada

bearing the name *Torymus sackeni* Ashmead. Twelve specimens collected by C. F. Baker, Agricultural College, Michigan, with Nos. 468, 187, 608, and 356. Three specimens from Waterbury, Conn. One specimen from Plummer Island, Md., and one specimen from Duval, Ga. Four specimens recorded under No. 218 with no further data other than reared January 29, 1891.

Felt⁹ records this species as parasitic on an Itonid midge gallmaker, namely, *Dasyneura serrulatae* Osten Sacken on *Alnus crispa* (Aiton) Pursh, and on *Dasyneura rosarum* Hardy on *Rosa*, species.

I have not had opportunity to examine the types of *Callimome fagopyrum* Provancher, but have put this species into synonymy from a careful study of the description. In this genus of a little more than 100 species there are but 2 species that have a rugose propodeum together with the supporting characters mentioned by Provancher. One of these, *ribesii* Huber, is reported from California only, while the other, *sackeni* Ashmead has been reported from Canada as already mentioned. It seems likely that *fagopyrum* and *sackeni* are identical.

18. CALLIMOME ALASKENSIS, new species

Figure 59

Torymus cecidomyiae (Walker) ASHMEAD, Proc. Washington Acad. Sci., vol. 4, 1902, p. 143, misidentification of *Callimome cecidomyiae* Walker.

Female.—Length 2.75 mm; ovipositor 1.5 mm. Body mostly dark green. Head as wide as thorax; viewed from the front subtriangular, sparsely clothed with white hairs and with a slight coppery reflection in some lights; carina separating antennae very well developed and decidedly elevated just below the antennae; scape long, blackish-green, flagellum dark brown; pedicel as long as the first joint of funicle, the ring-joint a little longer than wide; second and succeeding joints of funicle at least one-fourth shorter than the first and gradually increasing in width toward the tip; the first two joints of club a little shorter than the two preceding joints; ocellocular line equal to the lateral ocellar line. Thoracic dorsum with a cupreous tinge in some lights; mesoscutum finely reticulately punctate, the anterior portion rugose; scutellum smoother, not rugose, but with several shallow widely separated pits; scutellar cross furrow apparent on sides of scutellum, but visible only at certain angles in the middle; scutellar apex not so deeply reticulated and with a highly cupreous reflection; metanotum with a carina; propodeum coppery and smooth; coxae dark green, fore and mid femora infuscate in the middle outside, ferruginous at the tips, the hind femora dark brown with a slight greenish tint, except the tips, which are ferruginous; tibiae testaceous; last joint of tarsi brown; veins light brown; marginal

⁹ Report State Entomologist, 1913, pp. 166-187.

vein five-eighths as long as submarginal; stigmal vein petioled; abdomen mostly dark green, the first four segments medially incised; ovipositor just a little longer than the abdomen.

Male.—Unknown.

Type locality.—Kodiak, Alaska.

Host.—Unknown.

Type.—Cat. No. 25400, U.S.N.M.

In the reference cited above four specimens of *Callimome cecidomyiae* Walker are reported; they are all deposited in the National collection. Upon examination I have found three of them identical, while the fourth specimen belongs to a species of *Callimome* as yet undescribed. Inasmuch as the form represented by the three specimens does not agree with the rather inadequate description of *cecidomyiae*, and since I have not examined Walker's type, I have described it as a new species.

Distribution.—All these specimens were taken by T. Kincaid on the Harriman expedition, 1899. The type was taken on July 20; one paratype July 9 on Popoff Island, and another paratype July 26 at Virgin Bay.

19. CALLIMOME CAPITAE, new species

Figure 100

Easily separated from all other species by the unusual shape of the head.

Female.—Length 2.5 mm; ovipositor 2 mm. Thorax bluish-green and finely sculptured; the abdomen blue with a purple tint. Head distinctly wider than the thorax and very large, the vertex one-half as wide as the width of the head; head almost as thick as the width of pronotum; scape mostly yellow, brownish on upper side at tips; flagellum brown, the pedicel and ring-joint darker; the pedicel a little longer than the first joint of funicle; ring-joint as long as wide, and the joints of funicle not longer than wide; ocelli very small and forming an unusually high triangle, the posterior margin of mid ocellus separated from a line touching the anterior margins of the posterior ocelli by the length of the diameter of an ocellus; eyes reddish and not prominent. Thorax very elongate and narrow; scutellum oblong, nearly twice as long as wide; propodeum smooth, fore coxae infusate with a greenish tint, the mid coxae darker, and the hind ones greenish-blue with a tint of brown on the upper edge; rest of legs yellow, except the hind femora and hind tibiae which are infusate on the outside, and the tarsi which are yellow. Abdomen as long as thorax, three-fifths as wide and twice as deep as wide; wings strongly ciliate, veins light brown; marginal veins five-sixths as long as submarginal, and the stigmal vein petioled.

Male.—Length 1.4 mm. Uniform green and somewhat shining. Scape green, joints of funicle wider than long; coxae greenish brown,

legs yellowish, except all femora which are infuscate on the outside, the hind ones entirely brown; hind tibiae infuscate, except at tips; tarsi with last joint brown.

Type locality.—Washington, D. C.

Host.—*Lasioptera*, species.

Type.—Cat. No. 25357, U.S.N.M.

Described from three females and five males reared June 24 to July 7, 1884, and recorded under Bureau of Entomology No. 818 Pb°. The female type, a male allotype, and four paratypes are deposited in the National collection. Two paratypes are in the author's collection.

20. CALLIMOME FERRUGINEIPES, new species

Figure 61

Female.—Length 2.25 mm.; ovipositor 0.6 mm. Body green, legs dark testaceous. Head about as wide as the thorax; viewed from the front minutely sculptured and with a brassy luster in some lights; clothed with short feebly appressed hairs below the antennae; carina, separating antennae, poorly developed; scape uniform, dark testaceous, flagellum dark brown; pedicel distinctly longer than the first joint of funicle, the ring-joint about as long as wide; all joints of funicle wider than long and gradually increasing in width toward the tip; scape, plus the width of pedicel, attaining the level of the median ocellus; ocelli and eyes maroon. Thoracic dorsum green with a brassy reflection in some lights; minutely reticulately rugose with several shallow impressions; mesoscutum and scutellum gently convex; propodeum feebly reticulated, green and shining, the anterior margin with small pits; coxae almost entirely green, the rest of legs uniformly dark testaceous, except that the hind femora show a trace of brown and the tarsi are somewhat lighter; wing strongly ciliate, marginal vein two-thirds as long as submarginal, the stigmal vein petioled. Abdomen rather robust and shorter than the thorax; tergites nearly emarginate medially and steel blue in color; first three segments incised, the second and third feebly so.

Male.—Length 2 mm. Darker than the female and without any apparent brassy tint. Scape dark green; two front pairs of femora and tibiae and the hind tibiae with brownish green markings on the outside, the hind femora entirely green with a bluish tint, except the tips; last joint of tarsi brown. Abdomen shorter than the thorax and depressed.

Type locality.—Argus Mountains, California.

Host.—Collected on *Pinus monophylla* Torrey and Frémont.

Type.—Cat. No. 25394, U.S.N.M.

Described from 13 females and 1 male collected in May, 1891, by A. Koebele. The female type, male allotype, and 11 paratypes in the National collection. One paratype is in the author's collection.

In some specimens the hind femora are much darker, the color varying from a testaceous to a dark testaceous.

21. CALLIMOME RHODITIDIS, new species

Figure 95

Female.—Length 2 mm.; ovipositor about 1 mm. Thorax bluish-green with an undershade of brown. Head much wider than the thorax; seen from the front mostly brown beneath the antennae but with a tinge of green; carina extending two-thirds the distance from the antennae to the mouth; scape brown testaceous, the tips darker; the flagellum brown; pedicel robust and as long as the next two joints combined, the ring-joint as long as wide; joints of funicle as wide or wider than long, except the second and third; vertex with a golden tinge. Thoracic dorsum minutely reticulately punctate and clothed with rather long white hairs; scutellar cross furrow not prominent but easily conspicuous at certain angles; scutellar apex slightly shining; propodeum finely reticulated, smooth and with a delicate greenish-purple color; coxae brown testaceous, rest of legs entirely dark testaceous, except the hind tibiae which are moderately infusate and the tarsi which are somewhat lighter; wings strongly ciliate, veins pale brown, marginal vein four-fifths as long as submarginal, the stigmal vein petioled. Abdomen about same length as thorax; segments rather emarginate, but the first three with incisions visible at certain angles; antero-dorsally a delicate brown with a lavender or greenish tinge; sides brown and sparsely clothed with hairs; ovipositor as long as abdomen.

Male.—Scape dark brown; coxae dark brown; the hind femora and hind tibiae infusate, the rest of legs yellowish. Abdomen depressed.

Type locality.—Jamaica Plain, Massachusetts.

Host.—*Rhodites*, species on *Rosa*, species.

Type.—Cat. No. 25354, U.S.N.M.

Described from one female and three males reared from a gall May 12 or May 21, 1884, by Miss Cora N. Clarke, and recorded under Bureau of Entomology No. 3239. The female type, male allotype, and one paratype are in the National collection. One male paratype is in the author's collection.

22. CALLIMOME SYLVICOLA (Ashmead)

Figure 53

Torymus sylvicola ASHMEAD, Mem. Carnegie Mus., vol. 4, No. 1, p. 399.

Type locality.—Chapada, Brazil.

Host.—Unknown.

Type.—Cat. No. 8057, U.S.N.M.

Described from two females taken in April and October, one of which is in the National collection.

23. *CALLIMOME AENEOSCAPUM*, new species

Figure 56

Female.—Length, 2.25 mm.; ovipositor, 0.4 mm. Dark green with a very strong bronzy reflection. Head transverse, as wide as the thorax and a little wider than long; scape dark, brownish-green, the flagellum fuscous; pedicel with a greenish tinge and longer than the first joint of funicle; all joints of funicle longer than wide and closed rather sparsely with light brown hairs; antennal depression rather prominent, the median ocellus in its apex above; eyes dark red. Thoracic dorsum minutely reticulated and with numerous shallow impressions; pronotum with a shining green band at the anterior margin, the parapsidal furrows well defined and green; propodeum feebly but distinctly sculptured; coxae green with tints of bronze; fore and mid femora mostly yellow ferruginous, the front ones, which are swollen, infusate on the outside, except at the tips; the mid femora also infusate, the hind femora entirely dark brown but with a tint of green on the outside; hind tibiae infusate, the others yellow, except a little brown streak on the outside; wings strongly ciliate, veins brown; the marginal vein seven-eighths as long as the submarginal and the stigmal vein petioled. Abdomen distinctly shorter than the thorax and robust; ovipositor one-third as long as the abdomen.

Male.—Unknown.

Type locality.—Nampa, Idaho.

Host.—Unknown, but "reared from gall."

Type.—Cat. No. 25401, U.S.N.M.

Described from one female recorded under Bureau of Entomology No. 2655° and reared June 7, 1893, from material collected by R. Milliken.

24. *CALLIMOME ROSAE*, new species

Figure 96

Female.—Length, 2.5 mm.; ovipositor, 2.75 mm. Thorax dark green. Head transverse and wider than the thorax; face with a cupreous tinge in some lights, minutely reticulated and clothed very sparsely with feeble hairs; carina separating the antennae and extending one-half the distance to the mouth; antennal depression shallow; scape long, somewhat flattened, and reaching above the level of the median ocellus; scape greenish-brown, except the basal one-third which is yellow testaceous on the outside; flagellum brown; pedicel and ring-joint combined longer than the first joint of funicle; the ring-joint as long as wide and all joints of funicle distinctly longer than wide; the ocellular line about two and one-half times the diameter of an

ocellus; eyes red. Thoracic dorsum with a slight cupreous tinge at certain angles and minutely reticulate rugose; scutellum flattened and the cross furrow very obscure; propodeum minutely reticulated and cupreous; incision in the mesepimeron very shallow; coxae green, yellowish at the tips, trochanters yellow, femora yellow with a brown area in the middle on the outside; the hind femora entirely brown, except the tips; fore tibiae yellow, the hind ones light brown, except the tips; tarsi yellow, the last joint brown; wings strongly ciliate, veins brown; marginal vein four-fifths as long as the submarginal, the stigmal vein petioled. Abdomen longer than the thorax; green dorsally, the ventral and lateral areas bronzy; very slightly subcompressed.

Male.—Unknown.

Type locality.—Durango, Colo.

Host.—*Rhodites*, species on *Rosa fendleri* Crepin.

Type.—Cat. No. 25396, U.S.N.M.

Described from two females reared May 18, 1899, from material collected by C. F. Baker and recorded under Bureau of Entomology No. 8513⁰¹.

25. CALLIMONE MAGNIFICUM Osten Sacken

Figure 62

Callimome magnifica OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 3, 1870, p. 62, No. 7.

Callimome magnifica (Osten Sacken) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 188, No. 23 not *Callimome* (*Torymus*) *bedeguaris* Linnaeus.

Female.—Length, 4.75 mm.; ovipositor, 6 mm. Head viewed from the front rather triangular; antennae separated by a prominent carina; face with indistinct and irregularly placed impressions and with a cupreous reflection; scape yellow, the flagellum brown; all joints of funicle longer than wide, the first four or five twice as long as wide; vertex purplish; ocellular line about one and one-fourth times the long diameter of the post ocellus which is distinctly longer than the lateral ocellar line. Pronotum with a purplish spot at juncture with the head; rest of thoracic dorsum with a bluish green color and with numerous equally distributed impressions; pubescence very delicate; propodeum smooth, shining, bluish, and with small punctures on the anterior margin; fore coxae greenish-brown at base, the rest yellowish; mid coxae green testaceous; hind coxae green, yellowish at the tips; rest of legs yellow ferruginous; wings strongly ciliate, the stigmal vein petioled. Abdomen narrow and very decidedly longer than the thorax; somewhat produced anteriorly and cupreous with a tinge of purple; rest of abdomen purple-violaceous with tints of blue in some lights.

Male.—Length, 3.75 mm. Abdomen as long as the thorax, the posterior two-thirds cupreous with a purple tint. Otherwise essentially as in female.

Type locality.—Probably Connecticut.

Host.—*Rhodites radicum* Osten Sacken on *Rosa*, species.

Paratype.—Cat. No. 25391, U.S.N.M.

Type.—Museum of Comparative Zoölogy, No. 815.

This species is redescribed from the male and female paratypes in the National collection.

There are in the National collection three females and one male of *Callimome bedeguaris* (Linnaeus) reared in Europe and determined by G. Mayr. These are undoubtedly the specimens examined by Ashmead and upon the study of which he based his conclusions that *Callimome bedeguaris* (Linnaeus) and *Callimome magnificum* Osten Sacken were identical.¹⁰ The fact that both species have similar hosts and that they are very much alike in size and shape probably induced him to consider them as identical. However, after a careful study and comparison of the European specimens with specimens of *Callimome magnificum* Osten Sacken, I am convinced that they are not identical. They differ as follows: The propodeum and abdomen are entirely cupreous in *Callimome bedeguaris* (Linnaeus), whereas they are purplish or bluish in *Callimome magnificum* Osten Sacken; in the former the scutellar cross furrow is quite evident and the scutellar apex rather smooth and shining while in the latter the opposite is true; in *bedeguaris* the sculpture of the thorax is coarser, and the width of the mouth proportionately greater and the length of the head proportionately shorter than in *magnificum* which has the head more or less anteriorly produced.

Distribution.—Connecticut (?). In addition to the type series the following specimens are in the National collection: Four specimens from Waterbury, Conn. Two specimens reared February 6, 1884, at Nyack, N. Y., by J. L. Zabriskie and recorded under No. 145. Three specimens reared June 22, 1915, from *Rhodites radicum* Osten Sacken, collected by G. O. Donnel, Washington, D. C. One specimen from Waterbury, Conn., is in the author's collection.

26. *CALLIMOME CHRYSOCHLORA* Osten Sacken

Figure 63

Callimome chrysochlora OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 3, 1870, p. 63, No. 8.

Callimome solitaria OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 3, 1870, p. 64, No. 9.

Female.—Length 3.75 mm.; ovipositor 2.75 mm. Thorax green with a bluish tinge, and as long as abdomen. Head as wide as thorax; viewed from the front green and reticulately rugose; antennae separated by a carina that extends two-thirds of the distance to the margin of the mouth, the area below the carina decidedly cupreous;

¹⁰ Trans. Amer. Ent. Soc., vol. 3, 1870, p. 62.

scape yellow, brownish at tips on upper side; ocellular line exactly equal to the long diameter of post ocellus; distance from the foraminal margin to post ocellus one and one-half times the long diameter of post ocellus; pedicel brown and exactly as long as the first joint of funicle which is subequal to the second (flagellum broken off except the first two joints); thoracic dorsum clothed rather densely with silvery white hairs; parapsidal furrows well defined; tegulae yellow; scutellar apex rather highly polished on the posterior half the scutellar cross furrow scarcely visible; metanotum with a carina propodeum smooth, shining, and very feebly longitudinally reticulate; fore coxae greenish brown on the outside and yellow on the inside; mid coxae yellow ferruginous with a green tint; hind coxae green above, brown below and yellow at the tip; rest of legs yellow; wings ciliate; stigmal vein petioled. Abdomen dorsally with first three segments purplish blue, the anterior two-thirds of first with a testaceous undershade; first and second segments deeply incised, the third feebly incised; rest of abdomen greenish brown in some lights; hairs on sides more or less conspicuous.

Male.—Length 2.8 mm. Essentially same as female.

Type locality.—Probably Connecticut.

Host.—*Rhodites dichloceros* (Harris) Osten Sacken.

Paratype.—Cat. No. 25390, U.S.N.M.

Type.—Museum of Comparative Zoölogy, No. 818.

The female is redescribed from the paratype in the National collection.

Callimome magnificum Osten Sacken, *Callimome chrysochlora* Osten Sacken, and *Callimome solitaria* Osten Sacken were recognized by Osten Sacken as a difficult complex. There can be no doubt that the first named species is good; but it seems that there is considerable doubt as to the last two. It is my opinion that specimens formerly included under the last two species mentioned are conspecific and should be called *chrysochlora*.

In the National collection there are about 50 specimens reared from *Rhodites multispinosus* Gillette, taken in Illinois, and a like number reared from *Rhodites variabilis* Bassett, taken in Arizona. From the former lot I have selected four females that agree with the paratype described above; the remaining specimens differ primarily in having a longer ovipositor and a cupreous abdomen. In this series the ovipositor varies in length and the body varies somewhat in color. The specimens from Arizona are essentially alike, differing only in that some have a distinctly greenish-brown femora. I prefer to think of this complex as one in which there is considerable variation and in which some individuals are perhaps mutants. Careful breeding experiments may be necessary in order to establish the truth.

Distribution.—Connecticut (type). Fifty-three specimens, Hopkins No. 13604a, reared June 4 to August 6, 1915, by Wm. Middleton from *Rhodites multispinosus* Gillette, collected by L. H. Weld at Fort Sheridan, Ill. Forty-eight specimens, Hopkins No. 75600, reared from *Rhodites variabilis* Bassett April 29 to July 17, 1918, collected by L. H. Weld at Prescott, Ariz. One specimen from *Rhodites multispinosus* Gillette taken at Oxbow, Saskatchewan, by F. Knab. Three specimens from *Lytorhodites arefactus* on *Rose tendleri* Crépin, reared April 19, 1899, from galls collected in New Mexico. The following are in the author's collection: Six specimens reared July 24 to August 3 from *Rhodites dichloceros* (Harris) Osten Sacken on *Rosa*, species at Buckeye Lake, Ohio. The following were taken by A. C. Kinsey (dates given refer to time gall was collected and not to the time when parasites emerged): Two specimens March 17, 1920, at Ujiak, Calif., from *Diplolepis californica* Kinsey on *Rosa*, species. Four specimens June, 1919, at Forest Hill, Mass., from *Diplolepis ignota* (Osten Sacken) Kinsey. Three specimens April 12, 1920, La Grange, Oreg., from *Diplolepis bassetti* (Beutenmuller) Kinsey.

27. CALLIMOME TUBULARIS, new species

Female.—Length 3.75 mm.; ovipositor 4.5 mm. Green with a strong cupreous tinge in some lights. Head and thorax equal in width; face finely sculptured and densely clothed below the antennae with rather long white appressed hairs; antennae attached a little below the middle and separated by a poorly developed carina; scape somewhat flattened, the lower part yellow beneath, the rest gradually shading into light brown then into dark brown; flagellum brown; pedicel equal in length to the first funicle joint; the ring-joint a little wider than long; the joints of funicle nearly all one and one-half times as long as wide, except the last which is considerably shorter; eyes red; the ocellular line about one and one-half times the diameter of ocellus; the distance between a posterior ocellus and the anterior ocellus a little less than the diameter of an ocellus. Thoracic dorsum minutely rugose; posterior one-half of the mesoscutum and the scutellum somewhat flattened, the extreme apical edge of the latter smooth; propodeum smooth, shining, cupreous, metapleura also cupreous; fore coxae bronzy at the base, the tips yellowish; mid coxae greenish brown, the tips yellowish; hind coxae bronzy; front pairs of femora and tibiae yellow, the hind femora mostly yellow but infusate medially on the outside; the tarsi light yellow; wings strongly ciliate, the marginal veins seven-tenths as long as the submarginal, and the stigmal vein petioled; veins light brown. Abdomen green, the ventral area brown with a cupreous tint; longer than the thorax and slightly subcompressed, the first four segments deeply incised medially; tubularly produced posteriorly.

Male.—Thorax green with a cupreous reflection in some lights. Abdomen depressed. Color essentially same as in female. (The head and hind legs of the only male specimen were missing.)

Type locality.—Colorado.

Host.—Unknown.

Type.—Cat. No. 25324, U.S.N.M.

Described from three females and one poorly preserved male, collected by Engleman on willow. The female type, male allotype, and one paratype are in the National collection. There is one paratype in the author's collection.

28. *CALLIMOME STROBILOIDES*, new species

Figure 51

Female.—Length 3.5 mm.; ovipositor 4.25 mm. Thorax bright green, the abdomen bluish-green. Head about as wide as the thorax and very strongly depressed; face finely reticulately punctate and clothed sparsely with short white hairs; antennae separated by a low broad carina; antennae with scape brown testaceous, darker at tip; flagellum very dark brown, rather slender, all joints longer than wide and of nearly equal width, the club swollen; pedicel and ring-joint combined equal to the first joint of funicle, the ring-joint distinctly wider than long; funicle and club clothed with very closely set short hairs; vertex narrow and more coarsely rugose than face; the posterior ocellus one and one-half times the length of the diameter of an ocellus from the eye margin. Thoracic dorsum minutely reticulately punctured, the reticulations on the anterior portion of the mesocutum more elongate than on the posterior; parapsidal grooves distinctly marked but not deep; entire dorsum with irregularly placed impressions; propodeum smoothly reticulated and with a very distinct but not high carina; fore coxae infusate; mid coxae slightly greenish brown; the hind coxae greenish brown above and infusate at the tips; rest of legs yellow ferruginous, the hind femora and hind tibiae a little darker; tarsi yellow, except the tips which are brown; wings ciliate, veins pale brown, the marginal vein three-fifths as long as the submarginal, and the stigmal vein petioled. Abdomen longer than the head and thorax combined; viewed from the side the dorsal line not straight; strongly subcompressed but not carinate.

Male.—Unknown.

Type locality.—Columbus, Ohio.

Host.—*Rhabdophaga strobiloides* (Walsh) on *Salix chordata* Muhlenberg.

Type.—Cat. No. 25351, U.S.N.M.

Described from three females. The type reared by the author. One female paratype, recorded under Bureau of Entomology No. 215°, reared April 13, 1887, from *Rhabdophaga strobiloides* (Walsh)

on *Salix*, species collected at Richfield, N. Y., is in the National collection. There is one female paratype in the author's collection reared from the same species of gall on *Salix amygdaloides* Anderson, July 20, 1920, at Cedar Point, Ohio.

29. CALLIMOME SAPPORENSIS (Ashmead)

Figure 44

Torymus sapporensis ASHMEAD, Journ. New York Ent. Soc., vol. 21, p. 82.

Type locality.—Japan.

Host.—Unknown.

Type.—Cat. No. 7145, U.S.N.M.

One female type in the United States National Museum.

30. CALLIMOME JAPONICUM (Ashmead)

Figure 54

Torymus japonicus ASHMEAD, Journ. N. Y. Ent. Soc., vol. 12, June 1904, p. 82.

Type locality.—Japan.

Host.—Unknown.

Type.—Cat. No. 7144, U.S.N.M.

Described from one male specimen in the National collection. The specimen is not properly mounted for study.

31. CALLIMOME FLAVIVENTRE (Ashmead)

Figure 68

Torymus flaviventre ASHMEAD, Bull. 3, Kans. State Agr. Coll., Appendix, p. 4, 1888.

Female.—Length 3.5 mm.; ovipositor 2 mm. Thorax green. Head transverse and about as wide as the thorax; viewed from the front minutely reticulated and very sparsely clothed with feeble white hairs; antennal groove shallow and somewhat cupreous; scape yellowish, pedicel yellow infusate, the funicle and club intense black but clothed rather sparsely with white hairs; pedicel and first joint of funicle about equal in length, the latter just a little longer but only four-fifths as wide; the succeeding funicle joints gradually growing shorter and wider toward the tip; vertex bluish-green; the ocellocular line one and five-sevenths times as long as the lateral ocellar line. Thorax with a slight bluish tinge; dorsum minutely rugosely punctate with several irregularly placed impressions; thoracic grooves not deep but all very distinctly marked; anterior lines of scutellum forming very near a right angle, but not coming to a distinct point; scutellar apex somewhat shining; mesepimeron shining brown, except the posterior portion which is dark green; propodeum moderately reticulated; fore and mid coxae, and the hind coxae, except the basal two-thirds which is greenish-brown, and all the rest of the legs entirely and uniformly pale testaceous; wings ciliate,

veins pale brown; marginal vein not quite three-fourths as long as the submarginal and the stigmal vein petioled. Abdomen distinctly longer than the thorax; greenish-brown dorsally, the sides dark brown with tints of green, except the ventral one-third which is testaceous; rather strongly subcompressed and carinate ventrally; sides clothed sparsely with gray hairs; ovipositor not much longer than the abdomen.

Male.—Unknown.

Type locality.—Riley County, Kans.

Host.—Unknown.

Type.—Cat. No. 25398, U.S.N.M.

This species is redescribed from the female type taken by C. L. Marlatt in September.

32. *CALLIMOME MISSOURIENSIS*, new species

Figure 69

Female.—Length 2.5 mm.; ovipositor 1.75 mm. Thorax bluish-green. Head a little wider than the thorax; face minutely reticulated and moderately clothed with rather long semiappressed white hairs; carina low and extending to the margin of the shallow depression that surrounds the antennal groove; scape bright yellow, except a little fuliginous tinge at the extreme tip above; scape not cylindrical; flagellum brown, pedicel and first funicle joint equal in length, the ring-joint a little wider than long; joints of funicle of nearly equal width but gradually growing shorter toward the tip, the first three or four distinctly longer than wide, the last joint distinctly wider than long. Thorax rather elongate and convex; dorsum reticulately punctate, with numerous irregularly placed shallow impressions and many rather long conspicuous white hairs; parapsidal furrows well defined for their entire length, the posterior of each curving outward; propodeum finely reticulated and shining in the middle; fore coxae entirely yellow, mid coxae mostly fuliginous, hind coxae greenish brown and coarsely punctured above, brown and more finely sculptured below; femora and tibiae yellow, except the hind tibiae which are infusate; tarsi yellow; wings rather strongly ciliate, veins flavo-testaceous, marginal vein about five-sixths as long as submarginal; stigmal vein petioled. Abdomen bluish and a little shorter than the thorax; rather strongly subcompressed; antero-dorsal area violaceous purple in some lights; segments medially emarginate, the sides sparsely clothed with short white hairs; ovipositor longer than the abdomen.

Male.—Length 2 mm. Thorax cyaneous with tinge of green. Scape dark green, flagellum fuscous; eyes reddish; fore coxae yellow with a very slight brownish tinge; hind femora and tibiae very strongly infusate. Abdomen short and depressed.

Type locality.—Cadet, Mo.

Host.—*Cecidomyia*, species, gall on stems of *Rubus*, species.

Type.—Cat. No. 25395, U.S.N.M.

Described from six specimens from the type locality recorded under Bureau of Entomology No. 721p° and reared April 28, 1883, from material collected by J. G. Barlow; and one female under the same number reared March 13, 1891, from material collected at Providence, Ind., by F. M. Webster. The female type, male allotype, and two female and one male paratypes are in the National collection. A male and female paratype from the type locality are in the author's collection.

33. CALLIMOME ASTERIDIS, new species

Figure 58

Female.—Length 3.2 mm; ovipositor 1.8 mm. Body green; thorax bluish in some lights, rather elongate and finely reticulately punctate dorsally. Head transverse and very much wider than the thorax; face minutely sculptured and clothed sparsely with very feeble hairs; carina separating antennae not prominent; the antennal depression very shallow; scape orange yellow, flagellum brown; pedicel about as long as first joint of funicle and as long as wide; all joints of funicle longer than wide although the last one is very little longer and somewhat wider than the first; ocelli amber, eyes purplish red ocellular line equal to the diameter of an ocellus. Mesoscutum posteriorly flattened; scutellum convex; scutellar cross furrow not conspicuous, but the apical end of the scutellum more finely sculptured than the anterior; propodeum finely reticulated and somewhat smooth; fore coxae and legs entirely yellow, except the mid coxae which are tawny and the hind coxae which are brownish below and greenish above, the tips of each yellowish; last joint of tarsi brown; wings strongly ciliate; veins light brown; the marginal vein three-fourths as long as the submarginal and the stigmal vein petioled and very oblique. Abdomen as long as thorax, rather strongly subcompressed and mostly green; first three segments distinctly medially incised; antero-dorsal area tawny with a lavender tint in some lights, the sides brownish ventrally.

Male.—Length 2 mm. Scape fuscous, flagellum brown and densely pubescent; pedicel as long as first funicle joint and ring-joint combined; first funicle joint about one-fourth shorter than the second, and the succeeding four not much longer than wide; fore coxae with a greenish brown tinge at the base; other coxae darker than in female; rest of legs testaceous, except the hind femora and hind tibiae which are infusate in the middle. Abdomen fuscous and with a very conspicuous pubescence.

Type locality.—Holderness, N. H.

Host.—*Cecidomyia*, species, gall on *Aster*.

Type.—Cat. No. 25365, U.S.N.M.

Described from one female type and one male allotype in the United States National Museum and reared by A. Koebele May 21, 1884. These specimens are recorded under Bureau of Entomology No. 3231.

34. *CALLIMOME ATRIPLICIS*, new species

Figure 45

Female.—Length 2.5 mm; ovipositor 1.2 mm. Thorax aeneous in some lights; abdomen darker. Head viewed from front finely reticulate and very strongly cupreous in some lights and at certain angles; scape brown testaceous, flagellum brown, the pedicel darker and longer than the first funicle joint; joints of funicle not all longer than wide but of nearly equal width; eyes dark red. Thoracic dorsum with a roughly reticulated surface and conspicuously clothed with white recumbent hairs; propodeum moderately reticulated; coxae dark coppery green, the pleura dark cupreous and entirely reticulated; mesepimeron shining coppery, except the posterior part which is greenish; femora and tibiae testaceous, tarsi citrine except the last joint which is brown; wings strongly ciliate, veins pale testaceous, the stigmal vein petioled. Abdomen green with an aeneous reflection dorsally and laterally in some lights, except the first segment which is without a coppery reflection; first four segments medially incised.

Male.—Unknown.

Type locality.—Los Angeles County, Calif.

Host.—Cecidomyid gall on *Atriplex canescens* (Pursh) Nuttall.

Type.—Cat. No. 25402, U.S.N.M.

Described from two females collected by A. Koebele, June, 1887, and recorded under Koebele No. 229°.

35. *CALLIMOME KINSEYI*, new species

Figure 99

Female.—Length 2.8 mm.; ovipositor 2.5 mm. Thorax metallic green with cupreous reflections; minutely sculptured; abdomen dark green. Head strongly transverse and as wide as thorax; viewed from the front produced anteriorly, very strongly depressed and green with a golden tinge in some lights; antennae separated by a prominent carina which extends nearly to the mouth; scape fuscous with a bronzy tinge; flagellum brown the pedicel and ring-joint darker; pedicel a little longer than the first joint of funicle, all joints of which are distinctly longer than wide but increasing slightly in width toward the tip; each joint of funicle clothed with regularly and widely placed light-brown hairs that are almost as long as a joint itself. Thoracic dorsum not heavily clothed with white hairs; parapsidal furrows well defined; the scutellar cross furrow not conspicuous; scutellar apex cupreous; pleura very cupreous the depressions green; propodeum moderately reticulately punctate; coxae bronzy, femora and tibiae ferruginous at tips the middle brown outwardly, and the

hind femora fuscous; first two tarsal joints citrine, the next two ferruginous and the last one brown; wings strongly ciliate, veins brown; marginal vein five-eighths as long as submarginal the stigmal vein petioled. Abdomen a little longer than the thorax; not strongly sub-compressed, the posterior somewhat tubularly produced; dark green, shining and medially emarginate; sparsely clothed with long hairs; ovipositor one and one-half times as long as the abdomen.

Male.—Length 2.25 mm. Scape fuscous; all joints of funicle wider than long, and very densely pubescent; femora and tibiae infuscated, the hind femora dark green and the hind tibiae fuscous. Abdomen shorter than the thorax and strongly depressed.

Type locality.—Inyo, Calif.

Host.—Dipterous gall on *Artemisia*, species.

Type.—Cat. No. 25361, U.S.N.M.

Described from four females and five males reared from a gall April 9, 1887, and recorded under Koebele No. 428. One female type, one male allotype, and five paratypes are in the National collection; two paratypes, with the same data, are in the author's collection. There are also two specimens under Bureau of Entomology No. 5089^o reared June 30, 1891, from a gall formed by *Trypeta*, species on *Chrysothamnus viscidiflorus* (Hooker) Nuttall (*Bigelovia douglasii* Gray) collected by E. A. Schwarz at American Fork, Utah.

36. CALLIMOME PILULARIDIS, new species

Figure 72

Closely related to *Callimome baccharidis*, new species, but separated by the color of the hind femora and tibiae.

Female.—Length 2.25 mm.; ovipositor 0.9 mm. Thorax greenish-brown and finely sculptured; abdomen shining fuscous. Head transverse and decidedly wider than the thorax; viewed from the front minutely reticulated and sparsely clothed with short white hairs; green fuscous; antennal depression enlarged including most of the face, the depression as deep as the diameter of the scape plus that of the flagellum; antennae separated by a strongly developed carina; scape dark green and extending three-fourths the distance to median ocellus; flagellum fuscous and somewhat shining; the pedicel a little longer than the ring-joint and first funicle joint combined; ring-joint not quite as long as wide, all joints of funicle gradually growing wider toward the tip, but all a little longer than wide; each funicle joint clothed with regularly arranged and widely separated testaceous hairs that are almost as long as a joint; eyes fuliginous. Thorax elongate and conspicuously clothed with rather long white bristly hairs; parapsidal furrows well defined; scutellar apex not so deeply sculptured as the anterior portion; the scutellar cross furrow not definite; propodeum rather smooth, the anterior margin with numerous small pits; coxae brownish, the hind ones with a greenish tinge; femora and tibiae

shining light brown, except a little lighter at the tips; the hind femora and tibiae much darker; tarsi with basal half citrine; wings strongly ciliate; marginal vein two-thirds as long as submarginal, the stigmal vein petioled. Abdomen as long as thorax, slightly subcompressed and dorsally depressed; segments medially emarginate; conspicuous white hairs on sides; ovipositor a little shorter than abdomen.

Male.—Length 2.5 mm. Scape greenish brown; thorax rather robust, and with a cupreous tinge; legs darker than in female.

Type locality.—Martinez, Calif.

Host.—*Prosoma*, species on *Baccharis pilularis* De Candolle.

Type.—Cat. No. 25355, U.S.N.M.

Described from two males and two females reared in January, 1883. The female type, male allotype, and one paratype in the National collection. One female paratype is in the author's collection. These specimens are recorded under Bureau of Entomology No. 2964°.

37. *CALLIMOME BACCHARIDIS*, new species

Figure 57

Female.—Length 2.5 mm. ovipositor 1.2 mm. Head and thorax green with a cupreous tinge; thoracic dorsum minutely sculptured. Head transverse and a little wider than the thorax; face bronzy in some lights and clothed with weak appressed hairs; antennae separated by a rather prominent carina which extends one-half the distance to the margin of the mouth; scape rather cylindrical, mostly brown, but yellowish underneath; flagellum fuscous; pedicel shining and longer than the first joint of funicle, the ring-joint as long as wide; joints of funicle very slightly longer than wide and with a single row of regularly arranged and widely placed tawny hairs around each, giving a distinctly keeled appearance; antennal depression shallow; the distance between the margin of eye and posterior ocellus and between the posterior ocellus and median ocellus equal; eyes reddish. Posterior part of mesoscutum with larger reticulations and punctures than the scutellum which is very finely reticulated and with conspicuous but smaller, shallow impressions; entire dorsum covered with rather long white hairs which are longest on the apical end of scutellum; propodeum smooth and coppery; fore coxae green on the outside and brown inside; mid coxae more uniform greenish-brown, the hind ones brownish underneath and green and coarsely sculptured above; rest of legs testaceous, except the tarsi; tarsi citrine, except the last joints which are brown; wings strongly ciliate, veins light brown; the marginal vein about five-sevenths as long as submarginal; stigmal vein petioled the uncus long and not definitely terminated. Abdomen about as long as thorax, green with a brownish tint; first four segments deeply incised medially; ovipositor about same length as abdomen.

Male.—Length 2.2 mm. Scape greenish brown; legs yellow ferruginous except the hind femora, which are greenish brown on the outside, and the hind tibiae, which are dark testaceous in the middle. Abdomen strongly depressed.

Type locality.—San Francisco, Calif.

Host.—*Cecidomyia*, species gall on *Baccharis pilularis* De Candolle.

Type.—Cat. No. 25364, U.S.N.M.

Described from 11 females and 4 males recorded under Bureau of Entomology No. 4° reared July 16, 1885. The female type, male allotype, and 11 paratypes in the National collection; two paratypes are in the author's collection.

38. CALLIMOME LONGISTIGMUM, new species

Figure 50

Female.—Length 3 mm.; ovipositor 2 mm. Green and minutely sculptured. Head as wide as thorax; face finely sculptured and sparsely clothed with whitish hairs; antennae separated by a low and rather broad carina; area below the carina somewhat coppery; antennal depression shallow, aeneous near the base of the antennae; vertex broad and more coarsely sculptured, slightly rugose; ocelli amber; the ocellular line twice as long as the lateral ocellar line, and not quite two-thirds as long as the post ocellar line; scape yellow beneath, about one-fourth yellowish above, the rest shading into brown; flagellum fuscous; pedicle shorter than the ring-joint and first funicle joint combined; the ring-joint as long as wide; all joints of funicle of nearly equal length but gradually growing a little wider toward the tip, clothed with short hairs and a row of longer and yellowish hairs regularly arranged and widely placed. Thoracic dorsum gently convex, and cupreous; minutely reticulately rugulose; anterior end of scutellum truncate; metanotum smooth and shining, the propodeum also feebly sculptured; the pits on the anterior margin of propodeum very small and few; coxae all green, femora and tibiae yellow, the femora with a very slight greenish brown tinge in the middle, the hind femora and tibiae infuscated in the middle; tarsi light yellow; wings strongly ciliate, veins light brown; marginal vein a little less than three-fourths as long as submarginal, the stigmal vein petioled. Abdomen green with a chalybeous tint and shorter than the thorax; first three segments strongly incised; sides fuscous; ovipositor a little longer than abdomen.

Male.—Length 1.75 mm. Head strongly depressed; scape green but somewhat brownish at the base. Thorax elongate. Otherwise similar to female.

Type locality.—Los Angeles County, Calif.

Host.—Woody gall on willow—*Cecidomyia*, species.

Type.—Cat. No. 25359 U.S.N.M.

Described from six females and three males collected by D. W. Coquillett. One female type, a male allotype, and five paratypes in the National collection. Two paratypes are in the author's collection.

39. *CALLIMOME CITRIPES*, new species

Figure 67

Resembles *Callimome coloradensis*, new species, but is separated as indicated in the key.

Female.—Length 3.3 mm.; ovipositor 3 mm. Uniform green. Head transverse and very distinctly wider than the thorax; viewed from the front less than five-sixths as long as wide, entirely dark green and finely sculptured; clothed rather densely below the antennae with long appressed hairs; antennae separated by a low carina; scape cylindrical, the lower part yellow-testaceous on the outside, the rest brown to fuscous with a tinge of green; pedicel and first joint of funicle about equal, the ring-joint a little wider than long; funicle fuscous and somewhat shining through the pubescence; all joints of funicle longer than wide, although the last joint is very little longer than wide; antennal depression shallow, with a brassy tint, the median ocellus within its apex; ocelli red, eyes reddish-brown. Thoracic dorsum entirely dark green and clothed with short silvery white hairs; mesoscutum and scutellum rather convex; metanotum smooth, shining; propodeum smooth, weakly reticulated and green; coxae green with a bronzy reflection at the tips, the rest of legs except tarsi, ferruginous; tarsi whitish-yellow, the tips brown; stigmal vein petioled. Abdomen about as long as thorax, rather depressed above; all segments except the first distinctly but not deeply reticulated; first four segments medially incised the second and third most deeply, and all, including only the margin of the first, with a purplish tinge; sides densely clothed with white hairs that are nearly three-fourths as long as the width of the exposed part of the segments.

Male.—Length 3 mm. Green. Antenna with joints of funicle almost as wide as long, scape dark green; eyes maroon. Coxae dark green, all femora dark greenish-brown on the outside, the hind femora almost all dark green; hind tibiae fuscous, the others yellow-ferruginous; tarsi yellow. Abdomen as long as thorax; depressed.

Type locality.—Fort Garland, Colo.

Host.—*Euaresta tricolor* Doane on *Artemisia tridentata* Nuttall.

Type.—Cat. No. 25393, U.S.N.M.

Represented in the National collection by the type series which consists of one female type, one male allotype, and one male paratype reared July 3, 1883, and recorded under Bureau of Entomology No. 3129°.

40. CALLIMOME COLORADENSIS, new species

Figure 70

Female.—Length 2.5 mm.; ovipositor 2.5 mm. Body green, the thorax metallic and abdomen shining. Head wider than thorax; front minutely sculptured and somewhat depressed in the region of the antennal attachment; front of head rather densely clothed with white appressed hairs; scape flattened, not reaching to the median ocellus, about two-thirds of the lower side yellow, the tip and upper side brownish; flagellum brown, the pedicel and ring-joint fuscous; pedicel and ring-joint combined longer than the first joint of funicle, the ring-joint as long as wide; all joints of funicle longer than wide; eyes and ocelli red. Thoracic dorsum finely sculptured and moderately clothed with silky white hairs; parapsidal grooves well defined; propodeum feebly reticulated and shining; mesepimeron very deeply incised, coppery; coxae green; fore and mid legs mostly yellow-ferruginous, but with the femora lightly infuscated outside, the hind ones greenish brown except the tips; tibiae infuscated in the middle the hind one very dark; last two joints of tarsi brown; wings strongly ciliated, veins light brown; marginal vein three-fourths as long as the submarginal, the stigmal vein petioled. Abdomen very slightly subcompressed; segments medially incised, emarginate; ovipositor longer than abdomen.

Male.—Length 2 mm. Scape entirely dark green; first joint of funicle distinctly longer than wide; ocellocular line no longer than the long diameter of post ocellus. Abdomen shorter than the thorax.

Type locality.—Fort Garland, Colo.

Host.—*Cecidomyia*, species gall on *Artemisia*, species (Sage Brush).

Type.—Cat. No. 25363, U.S.N.M.

Described from nine females and five males reared June 25–27, 1883, by F. L. Bruner and recorded under Bureau of Entomology No. 3120⁰². The female type, male allotype, and 10 paratypes in the National collection. Two paratypes are in the author's collection.

41. CALLIMOME PERPLEXUM, new species

Stigmal vein similar to Figure 41

This species is separated from all others in the genus by the dusky wings, as indicated in the key. The sculpture of the thoracic dorsum is also unique. In all other respects it is typically a *Callimome*.

Female.—Length 5 mm.; ovipositor 11 mm. Thorax atropurpureus with a bluish tinge; the abdomen same color. Head as wide as thorax; face finely rugose and with shallow umbilicate impressions; antennae separated by a prominent carina; two broad brown lines extending from the antennae to margin of mouth; scape fuscous with greenish tinge, flattened and attached about the middle of head and reaching

above the anterior margin of median ocellus; pedicel greenish-brown, the rest of flagellum brown; pedicel and ring-joint combined equal to the first joint of funicle; first and second funicle joints equal, the third distinctly shorter but all longer than wide and of nearly equal width; ocelli brunneous, the eyes maroon, posterior ocelli the length of their diameter from margin of eyes. Thoracic dorsum with crimson tints in some lights and with a coarse rugosity that is very shining; rugosity on the scutellum not transverse; scutellar cross furrow well defined, the scutellar apex feebly but distinctly reticulated; propodeum with several semilongitudinal wrinkles, the anterior margin punctured; coxae and femora, except tips, same color as thorax, the latter brown inside; tibiae ferruginous, tarsi citrine, except the last joint, which is testaceous; wings with a dusky area in the middle, veins brown; marginal vein one-half as long as submarginal, the stigmal vein sessile. Abdomen strongly subcompressed; first four segments deeply incised dorsally.

Male.—Unknown.

Type locality.—Ashland, Oreg.

Host.—*Disholcaspis maculipennis* (Gillette) on *Quercus garryana* Douglas.

Type.—Cat. No. 25339, U.S.N.M.

Described from a single female reared August 9, 1915, from a gall collected by J. M. Miller and recorded under Hopkins U. S. No. 12595b².

42. *CALLIMOME CRUENTATUM*, new species

Figure 26

Female.—Length 2.25 mm.; ovipositor 0.7 mm. Body mostly crimson. Head wider than the thorax, mostly crimson but fuscous below the antennae; antennae attached below the middle of front and separated by a poorly developed carina; antennal scape yellow testaceous, long, but not attaining height of the median ocellus; flagellum light brown and shining; pedicel longer than the first joint of funicle and ring-joint combined, the latter much wider than long; first funicular joint appearing nearly quadrate when seen from side, the following joints increasing gradually in width, the last about one-third wider than long; eyes almost same color as head but not shining; post ocelli distinctly nearer the eye margin than to the median ocellus. Thoracic dorsum minutely reticulately rugose; prothorax very short and margined posteriorly with a shining band; mesocutum anteriorly wider than long; parapsidal furrows well defined and black; scutellar cross furrow hardly apparent, indicated by a faint bluish line seen at certain angles; propodeum smooth, light brown with a crimson tinge in some lights; coxae crimson fuscous, femora and tibiae brown, the hind ones darker but all with a crimson tint; last joint of tarsi yellow,

otherwise pale yellow; wings moderately ciliate, marginal vein four-fifths as long as submarginal, the stigmal vein sessile. Abdomen shorter than thorax, mostly crimson, with a deep undertone of light brown, the anterior portion with a flavo-testaceous blotch dorsally; segments one and two conspicuously incised; ovipositor shorter than abdomen.

Male—Length 2 mm. Crimson fuscous. Antennae entirely light brown. Otherwise similar to female.

Type locality.—Connecticut.

Host.—Cynipid, gall on leaf of *Quercus virginiana* Miller.

Type.—Cat. No. 25319, U.S.N.M.

Described from one female type and male allotype and two female paratypes reared March 27 to April 28, 1882, by William Wittfield, and recorded under Bureau of Entomology No. 2605°. The galls were described as "depressed on upper side with center somewhat elevated; grayish yellow; lower side projecting." One female paratype is in the author's collection; the remainder of the type series is in the National collection.

43. CALLIMOME MULTICOLOR, new species

Figure 29

This species may be separated from all others by the comparative length of the first funicle joint.

Female—Length 2.75 mm.; ovipositor 1.2 mm. Cupreous in reflected light; tinged with green in natural light. Head transverse, wider than the thorax; viewed from the front five-sevenths as long as wide and very strongly depressed; scape, except at base, cupreous, long, slender, and extending to the median ocellus; pedicel cupreous, the rest of the flagellum brown; pedicel almost as long as first and second funicular joints, but not as long as wide; first joint of funicle about one-half as long as the second, the other joints gradually growing wider toward the tip; vertex highly rugose; ocelli pinkish, the eyes red. Thoracic dorsum minutely reticulately rugose; parapsidal furrows distinct and green; sculpture of the scutellum longitudinally rugose, the cross furrow indicated only by a less deeply sculptured apex; propodeum smooth and shining; wings moderately ciliate, veins brown; marginal vein two-thirds as long as the submarginal, the stigmal vein sessile; femora and tibiae cupreous, the hind ones with a greenish tinge; tarsi testaceous, the last joint brown. Abdomen aeneous with a fuscous shade in some lights; ovipositor as long as abdomen.

Male.—Unknown.

Type locality.—Los Angeles County, Calif.

Host.—Gall on *Ephedra*, species

Type.—Cat. No. 25341, U.S.N.M.

Described from two females recorded under Koebele No. 2380 and taken by A. Koebele May, 1887. Both specimens in the National collection.

44. *CALLIMOME KOEBELEI*, new species

Similar to Figure 23

Easily separated from all other species by the delicate sculpture of the dorsum and its obscure parapsidal furrows.

Female.—Length 2.3 mm.; ovipositor 2.75 mm. Thorax delicate green with a slight brassy tint on the anterior part of mesoscutum in some lights. Head as long as wide; viewed from the front finely reticulated and strongly depressed; face, below the scape, clothed with very conspicuous white appressed hairs, a row of hairs bordering margin of eyes; scape attached much below the middle of front and not extending more than three-fourths the distance to the median ocellus; scape and pedicel greenish-brown; rest of flagellum clothed with ochraeous pubescence; pedicel much longer than the ring-joint and first funicle joint combined, the first funicle joint not more than one-third as long as the second, the second about as wide as long and the rest slightly longer than wide and gradually increasing in width toward the tip; ocelli a little more than one and one-half times the diameter of an ocellus from the eye margin. Thoracic dorsum somewhat flattened and microscopically transversely reticulately rugose on the mesoscutum and the scapulae, sculpture exceedingly delicate; parapsidal furrows very obscure being indicated only by a delicate line; cross furrow on scutellum not deep but well indicated by a difference in the sculpture of the scutellum; reticulations before the furrow more or less longitudinal or fan-like and behind the furrow transverse; scutellar apex rounded apically; propodeum nearly vertical, shiny, and with a number of pits on the anterior margin on each side of the middle; somewhat purpurescent with violet tinge ventrally; coxae, femora, and tibiae fuscous, the femora behind somewhat greenish; hind coxae brown with violet tinge above; veins yellow; marginal vein a little more than twice as long as the submarginal, the stigmal vein sessile. Abdomen rather strongly compressed and darker than the thorax.

Male.—Length 1.5 mm. Body dark green; femora dark green the tibiae fuscous.

Type locality.—San Francisco, Calif.

Host.—Cecidomyid gall on *Baccharis pilularis* De Candolle.

Type.—Cat. No. 25407, U.S.N.M.

Described from 17 specimens reared from the above named host July 16, 1885, and recorded under Koebele No. 4². The female type and male allotype and 13 paratypes in the National collection. Two paratypes are in the author's collection.

45. CALLIMOME LIVIDUM Ashmead.

Figure 7

Callimome lividus ASHMEAD, Trans. Amer. Ent. Soc., vol. 12, 1885, Proc., p. xiii, No. 8.

Torymus lividus (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 188.

The original description is as follows:

Female.—Length 2.5 mm.; ovipositor 1.5 mm. Deep blue. The space back of eyes and face above mouth, metallic green; apical portion of scutellum and metathorax smooth, not punctured; legs rufous with femora above blue; tarsi honey yellow. The two apical abdominal segments are green and the ovipositor is black, excepting a pale spot at the base.

Type locality.—Jacksonville, Fla.

Host.—Unknown.

Type.—Cat. No. 25321, U.S.N.M.

Ashmead described this species from two specimens taken at large. It had never been given a type number nor entered in the type book. Only one specimen labeled as this species was found in the collection; the head and abdomen are entirely gone and parts of the legs are missing. However, after careful study of the parts remaining, I am convinced that this specimen is one of the types.

In addition to the description above I have noted the following:

The thoracic dorsum is finely transversely reticulated, the reticulations being elongate; the scutellar apex is shining; the femora and hind tibiae are shining brown and the other tibiae ferruginous; the hind coxae are purpurescent with a crimson tint in some lights. Stigmal vein sessile.

46. CALLIMOME DRYOPHANTAE (Ashmead)

Figure 23

Syntomaspis dryophantae ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187, No. 21.

Female.—Length 2.3 mm.; ovipositor 1.8 mm. Mostly bronzy brown with a slight greenish reflection in some lights. Head distinctly wider than the thorax; seen from above minutely sculptured and with numerous silvery bristles below the antennae and with a row of short white bristles along the margin of the eyes; almost destitute of hairs above the antennae; scape light brown with a few short stout whitish bristles, the flagellum brown; ocelli and eyes reddish. Thorax minutely, transversely reticulately rugose; parapsidal grooves scarcely perceptible appearing only as dark lines; scutellum more finely sculptured than the mesoscutum; the scutellar cross furrow a little beyond the apical one-third; scutellar apex very feebly sculptured and hence highly polished; front coxae brownish, metapleura, mid and hind coxae with a brilliant crimson tint, except at the tips of coxae; femora and tibiae light brown, the tarsus whitish

except the last joint which is brownish; stigmal vein sessile; the marginal vein five-sixths as long as the submarginal. Abdomen as long as thorax; antero-dorsal area light brown, the rest fuscous; feebly reticulated; first, second, and third segments incised medially and almost emarginate; ovipositor brown.

Male.—Unknown.

Type locality.—Jacksonville, Fla.

Host.—(*Dryophanta*) *Neuroterus catesbaei* (Ashmead) on *Quercus catesbaei* Michaux.

Type.—Cat. No. 25318, U.S.N.M.

I have redescribed this species from a single type female from which Ashmead drew his description. There are, however, two specimens in the National collection labeled "*Syntomaspis lissus* Walker" and "*Syntomaspis theon* Walker" by Ashmead. Both of these specimens were taken at Jacksonville, Fla., and are so badly mutilated that it has been difficult to study them. It is certain that they are not identical with the species as described by Walker. After comparing them with the type specimens of *Callimome dryophantae* (Ashmead) I am convinced that they are both identical with it.

47. CALLIMOME ANTHOMYIAE (Ashmead)

Figure 22

Torymus anthomyiae ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 189, No. 28.

Female.—Length 1.8 mm; ovipositor 1.3 mm. Robust and shining, bronzy brown with purple tinge in reflected light. Head as wide as thorax; face minutely reticulate; ocelli amber color; scape yellowish except tips which are light brown; flagellum brown, the club and funicle pubescent; first joint of club three times as wide as the first joint of funicle which is as wide as long; vertex more coarsely sculptured than face. Thoracic dorsum minutely punctate and clothed sparsely with short white hairs; parapsidal grooves poorly defined, especially near the juncture with the scutellum; dorsum rather strongly convex; scutellar cross furrow seen only at certain angles; sculpture on the scutellar apex more shallow than on the anterior portion of scutellum, the apex slightly shining; coxae and femora same color as thorax, except that the tips of the femora are yellowish; tibiae testaceous the central portions brownish; tarsi yellowish, except the last joint, which is brown; veins of wings light yellow, the stigmal vein sessile; marginal vein five-sixths as long as the submarginal. Abdomen uniform brown and shining; sheath of ovipositor fuscous.

Male.—Unknown.

Type locality.—Jacksonville, Fla.

Host.—Unknown.

Type.—Cat. No. 2887, U.S.N.M.

This species is redescribed from two specimens in the National collection. It is most closely related to *Callimome dryophantae* (Ashmead) and *Callimome aeneum* Ashmead, but is decidedly more robust than either of them, besides differing in minor details.

Ashmead wrote that he suspected that this species was parasitic on an Anthomyiid larva which he found mining the leaves of a cultivated plant.

48. *CALLIMOME AENEUM* Ashmead

Figure 11

Callimome aenea ASHMEAD, Trans. Amer. Ent. Soc., vol. 9, 1881, Proc., p. xxxiii.

Callimome dryorhizoxeni ASHMEAD, Trans. Amer. Ent. Soc., vol. 12, 1885, Proc., p. xiii, No. 9.

Syntomaspis aeneus (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Syntomaspis dryorhizoxeni (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Torymus omnivorae ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 188, No. 26.

Female.—Length 2.3 mm; ovipositor 2.3 mm. Mostly brown, aeneous in some lights. Head three-eighths as long as wide; face finely reticulately rugose with irregularly placed shallow impressions, from which silvery white hairs arise; antennae separated by carina, which is long extending nearly to margin of mouth; scape ochraceous, the flagellum brown; joints of funicle a little longer than wide and each joint with minute longitudinal keels about three-fourths its length; club as long as the two preceding joints, the first joint of club very distinctly wider than the first joint of funicle; eyes reddish, ocelli amber. Thoracic dorsum finely reticulately rugose and rather sparsely clothed with moderately long whitish hairs; parapsidal grooves feebly impressed; irregularly placed shallow impressions on the dorsum scarcely visible; furrow separating the mesoscutum and scutellum deeply impressed and dark; scutellar cross furrow distinct, the scutellar apex less deeply sculptured than the rest of scutellum, without hairs and slightly polished; propodeum without carinae or lateral folds; coxae fuscous, trochanters light brown, femora brown except the tips, tibiae light brown, tarsi whitish, except the tips which are fuliginous; veins of wings pale yellow, the stigmal vein sessile. Abdomen as long as the head and thorax combined; more or less tubular and with long silvery hairs on the margins of segments; first four segments medially incised.

Male.—Length 1.5 mm. Entire body including legs, except tarsi, fuscous.

Type locality.—Jacksonville, Fla.

Host.—*Andricus virens* (Ashmead).

Type.—Cat. No. 2826, U.S.N.M.

Callimome aenea was originally described from several specimens. The present type series in the National collection consists of six females, one of which has been selected as electotype. The males have apparently been lost. The redescription is drawn from the type series, except for the male, in which case I have used the old description with a few changes.

Torymus omnivorae Ashmead and *Callimome dryorhizoxeni* Ashmead have been treated above as synonyms. Of the former there were specimens including type, allotype, and paratypes, Type Cat. No. 2885 U.S.N.M., all labeled Jacksonville, Fla. These were reared from *Disholcaspis omnivora* (Ashmead). Ashmead writes that the scutellum has no transverse groove; in this he was mistaken. Of *Callimome dryorhizoxeni* Ashmead there is one type and one paratype labeled Jacksonville, Fla., Type Cat. No. 1335, U.S.N.M., reared from (*Dryorhizoxenus*) *Eumayria floridana* (Ashmead).

Distribution.—Jacksonville, Fla. (Types). In addition to the type series the National collection contains the following: Two specimens, Hopkins No. 15634g, reared December 13, 1919, and November 23, 1920, from leaf galls on *Quercus laurifolia* (Michaux) collected by L. H. Weld at Dayton, Fla. One specimen, Hopkins No. 15334f reared September 1, 1920, from *Andricus virens* (Ashmead) on *Quercus geminata* Small, collected by L. H. Weld at Clearwater, Fla. Six specimens labeled Jacksonville, Fla., and nine specimens with no data, but which I have good reasons to believe to be from Florida, are in the same lot. In the author's collection there is one female, Hopkins No. 15634g, with data as above.

49. CALLIMOME DASYNEURAE, new species

Figure 10

Female.—Length 2.75 mm.; ovipositor 1.5 mm. Body bluish. Head blue-green, clothed sparsely with silvery white hairs, more densely so below the antennae; face minutely sculptured but with very shallow umbilicate impressions; antennae separated by a carina which is elevated strongly and extends one-third the distance to margin of mouth; antennae attached below the middle of front and in a rather deep groove; scape greenish-yellow, long, slender, and curved at the base; pedicel light brown, shining, robust, and longer than the first joint of funicle; flagellum light brown; last joint of funicle almost twice as wide as first joint, all more or less rectangular; eyes pinkish bordered with a row of minute short appressed hairs; ocelli very small and yellowish; the post ocelli a little more than twice the short diameter of an ocellus from eye margin; ocelli almost twice as wide as long. Thoracic dorsum reticulately punctate and cyaneous; nearly as wide as the distance from the tip of scutellum to a point

including the posterior one-third of the pronotum; clothed with inconspicuous reddish hairs; scutellar cross furrow well defined but not deep, the sculpture on the scutellar apex shallow; scutellum, anterior to the cross furrow, with a longitudinal depression through the center which has a greenish reflection and is more finely reticulated; propodeum shining; fore and hind coxae bluish-brown the hind coxae purplish; femora all bluish-brown, the inside brownish; tibiae all brown; tarsi pale yellow, except the tips, which are light brown; wings moderately ciliate, veins yellow; marginal vein about four-fifths as long as the submarginal; stigmal vein sessile. Abdomen, seen from above, ovate and slightly depressed, the anterior one-third with a slight yellowish under shade; third, fourth, and fifth segments almost truncate except very minute medial incisions; ovipositor four-fifths as long as abdomen.

Male.—Length 1 mm. Essentially as the female only much darker.

Type locality.—Wooster, Ohio.

Host.—*Dasyneura almea* Felt.

Type.—Cat. No. 25334, U.S.N.M.

Described from six females and one male reared by J. S. Houser at Wooster, Ohio. The type female, male allotype, and four paratypes are in the National collection; one paratype is in the author's collection.

50. CALLIMOME THALASSINUM (Crosby)

Figure 1

Syntomaspis thalassinus CROSBY, Can. Ent., vol. 40, 1908, p. 143.

Type locality.—New York.

Host.—*Harmolita*, species.

Type.—In the Cornell University collection.

I have not examined the type of this species. There are in the National collection 16 specimens of this species identified by A. B. Gahan, whose identification I have confirmed.

Distribution.—Ithaca, Amsterdam, Lake Keuka, Oneonta, Kingston, Cranberry Creek, Remsen, Elmira, Lowville, Bluff Point, Cortland, and Victor, N. Y., reported by Crosby. In the National Museum are the following: Four females and eleven males reared from timothy August, 1913. One male reared by C. N. Ainslie March 26, 1914, at Lewisville, Minn., recorded under Webster No. 8877. One female and two males from Waterloo, N. Y., collected by W. J. Phillips and recorded under Webster No. 9354. In the author's collection are two females taken by A. E. Miller, July 15, 1921, in sweepings from a timothy meadow on the Ohio State University farm, Columbus, Ohio.

The nearest known relative of *Callimome thalassinum* (Crosby) is *rohweri* which occurs on the western coast of the United States. The two species may be separated by a difference in sculpture.

51. *CALLIMOME ROHWERI*, new species

Figure 19

Closely allied to *Callimome thalassinum* (Crosby) but is separated by a distinct difference in the sculpture of the thoracic dorsum and in color, *rohweri* having a distinct bluish tinge.

Female.—Length 2.75 mm.; ovipositor 1.3 mm. Thoracic dorsum distinctly reticulately punctured and with a decided bluish-green color; abdomen deeply and widely reticulated, bluish. Head transverse, a little wider than the thorax and anteriorly produced; transversely rugose below the antennae, but vertically rugose between the eyes; face clothed with very weak silvery hairs which are longest near the margin of the mouth; antennae attached below the middle of head and separated by a short carina; scape yellow beneath, green for about two-thirds its length, cylindrical and reaching to median ocellus; pedicel blackish green, the rest of flagellum black; pedicel almost as long as ring-joint and funicle joint combined; ring-joint about twice as wide as long; ocelli and eyes reddish brown; the posterior ocelli one and one-half times the diameter of an ocellus from the eye margin. Pronotum and mesoscutum finely reticulately rugose, the parapsidal furrows black and well defined; furrow between the mesoscutum and scutellum very deep; anterior of the scutellum with more minute reticulations than the posterior portion, the rugosity on the scutellum more or less longitudinal instead of transverse; posterior part of mesoscutum more deeply punctate than the anterior; scutellar cross furrow well defined though not deep, the scutellar apex somewhat shining; metanotum and propodeum smooth, feebly reticulate, a few moderate-sized pits on the anterior margin; coxae and femora dark bluish green, except at the tips and inside, which are brownish; tibiae mostly ferruginous, bluish green in the middle outside; tarsi yellowish to light brown; wings moderately ciliate, veins yellow; the marginal vein two-thirds as long as the submarginal, the stigmal vein sessile. Abdomen mostly dark green with a bluish tinge, the first segment green and shining, the others metallic green with purplish margins; first three segments deeply incised; viewed from the side somewhat rounded and tubular; ovipositor as long as abdomen.

Male.—Length 2.3 mm. Scape dark green, all joints of flagellum wider than long; lateral ocellar line about equal to the ocellular line; legs brownish with a slight greenish tinge. Abdomen depressed.

Type locality.—Rio Vista, Calif.

Host.—*Lolium temulentum* Linnaeus containing *Harmolita*, species.

Type.—Cat. No. 25336, U.S.N.M.

Described from three females and one male. The female type was reared June 3, 1920, by B. G. Thompson and is recorded under Sacramento No. 20432. The male allotype was reared August 10, 1918,

by C. M. Packard from *Lolium temulentum* Linnaeus containing *Harmolita*, species (?) collected at Hercules, Calif., and is recorded under Berkley No. 1829. One male reared March 14, 1919, otherwise with date as above. The three mentioned specimens in the National collection. One specimen reared June 3, 1920, from *Lolium multiflorum* Lamarck containing *Harmolita*, species collected at Rio Vista, Calif., and recorded under Sacramento No. 20431 is in the author's collection.

52. CALLIMOME PUNCTIFRONS (Ashmead)

Figure 8

Syntomaspis punctifrons ASHMEAD, Jour. Linn. Soc. Lond. Zool., vol. 25, 1894, p. 154.

The original description follows:

Male.—Length 2 mm. Bronze green, polished, and sparsely covered with a whitish pile; face with rather coarse punctures and a median carina below the insertion of the antennae; scape knees, tibiae, and tarsi reddish yellow; flagellum brown-black, the joints about one and one-half times as long as thick. Collar triangular; mesonotum a little longer than wide, with distinct furrows; scutellum with a cross furrow at two-thirds its length; wings hyaline, the venation whitish the marginal vein almost as long as the submarginal, stigmal very minute.

I am including the original description of the type of this species. It was described from one male specimen which is probably in the British Museum and which I have not seen. In the United States National Museum there is one female of the species which was labeled as this species and is referred to in the Transactions of the Entomological Society of London,¹¹ but not described.

Female.—Length 2.7 mm.; ovipositor 3.5 mm. Dark green, tinged with black with a rather coarse transverse reticulately punctate rugulose dorsum. Head transverse and wide as thorax; viewed from the front green with a strong coppery tinge; face clothed quite densely with rather long white appressed hairs that arise from numerous and unusually large punctures, the space between the punctures minutely reticulated; antennae separated by a well developed carina which extends nearly to the margin of the mouth; scape yellow ferruginous, rest of flagellum light brown; pedicel and ring-joint ferruginous; pedicel as long as first joint of funicle, the latter two-thirds as long as the second funicle joint but distinctly longer than wide; other funicle joints decidedly longer than wide and with very conspicuous constrictions in the middle, giving each of them a double aspect; ocelli maroon and nearly in a straight row; the ocellular line, the lateral ocellar line and a line extending from the mid ocellus to the foraminal margin about equal in length; eyes bright red. Mesoscutum with a coarse rugosity and clothed with conspicuous white hairs;

¹¹ 1900, p. 253.

parapsidal furrows well defined; scutellum more finely sculptured than the mesoscutum; scutellar cross furrow very distinct; the apex of scutellum not so coarsely sculptured; propodeum rather smooth, the anterior margin along the outer one-third on each side of the middle, with pits; coxae greenish brown with a crimson tinge in some lights; femora infuscated in middle with a greenish tint on the outside; tibiae testaceous; veins of wings pale yellow; marginal veins five-eighths as long as the submarginal; stigmal vein sessile. Abdomen shining dark green, the medially emarginate sides clothed with rather long white appressed hairs.

Described from one female from Grenada, West Indies, collected by H. H. Smith.

Type locality.—St. Vincent.

Host.—Unknown.

Until both sexes of this species are taken together it can not be definitely said that the sexes have been correctly associated but Ashmead had determined the female described above as conspecific with the male and I have thought best to allow his determination to stand.

53. CALLIMOME TUBICOLA, Osten Sacken

Figure 31

Callimome tubicola OSTEN SACKEN, Trans. Amer. Ent. Soc., vol. 3, 1870, p. 60, No. 4.

Syntomaspis advena (Osten Sacken) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187. (Misidentification.)

Female.—Length 2.75 mm; ovipositor 3.5 mm. Metallic green. Head wider than the thorax; viewed from the front about five-sixths as long as wide; front reticulately rugose, the area below the antennae with more large shallow impressions than the area above and clothed with stout whitish hairs; face with a reddish-brown tinge below the antennae; eyes reddish; scape yellowish, slender and not reaching to the median ocellus; flagellum brown; pedicel and ring-joint together not equaling the first funicle joint; ring-joint twice as wide as long; all joints of funicle longer than broad, the club scarcely longer than the two preceding joints; all joints of funicle of equal width. Thoracic dorsum minutely transversely reticulately punctate and with numerous shallow impressions irregularly placed; thorax rather robust and with a very slight brassy tint in some lights; scutellum much flattened, punctures minute but rather deep, the central area with the smallest punctures; scutellar cross furrow plainly indicated by a bluish line; scutellar apex not so deeply sculptured and somewhat polished; propodeum smooth but with a slight indication of a carina; fore, mid, and lower one-half of hind coxae greenish brown, the upper half of the latter brownish crimson and deeply sculptured; trochanters and femora all greenish brown except the tips, the hind femora

darker green; fore and mid tibiae fuscous except the tips, the hind tibiae entirely fuscous; first three joints of tarsi whitish, the rest yellowish brown; veins of wings yellow, the marginal vein five-sevenths as long as the submarginal; stigmal vein sessile. Abdomen greenish brown, the first four segments more shining green above and medially incised.

Male.—Length 1.5 mm. Blackish green. Flagellum fuscous; joints of funicle not all longer than wide. Legs darker than in female. Otherwise similar to female.

Type locality.—Washington, D. C.

Host.—*Andricus tubicola* (Osten Sacken).

Type.—In the Museum of Comparative Zoology, Cambridge.

I have not seen the type, but I have described the species from a series of specimens some of which were compared with the type of *Callimome tubicola* Osten Sacken by Nathan Banks. The types of my descriptions are labeled as such.

Distribution.—Washington D. C. (Type.) The National collection contains the following: Three specimens under Bureau of Entomology No. 158^x, reared February 13, 1884, from *Andricus flocci* Walsh on *Quercus macrocarpa* Michaux, collected by A. Koebele at Washington, D. C. Three specimens Hopkins No. 12020j, reared June 13, 1913, from *Andricus seminator* Harris on *Quercus alba* Linnaeus, collected by W. Middleton, Falls Church, Va. Three specimens, Hopkins No. 12056j, reared June 25, 1914, with the same data as Hopkins 12020j. Seven specimens, Hopkins No. 13651i, reared June 16 to July 27, 1916, from *Andricus operator* Osten Sacken on *Quercus marylandica* Muenchausen, collected by W. Middleton at Falls Church, Va. Thirty-five specimens, Hopkins No. 13602, reared June 5 to July 29, 1915, from *Andricus seminator* Harris on *Quercus alba* Linnaeus collected by W. Middleton, at Falls Church, Va. Two specimens, Hopkins No. 10703c, reared May 7, 1913, from *Disholcaspis globulus* Fitch on *Quercus prinus* Linnaeus, collected by S. A. Rohwer at Falls Church, Va. One specimen, Hopkins No. 13603d, reared June 28, 1915, from *Amphibolips coccinea* (Osten Sacken) Ashmead, on *Quercus rubra* Linnaeus, collected by W. Middleton at Plummer Island, Md. One specimen, Hopkins No. 11356b, reared April 12, 1913, from a species of Argidae. *Quercus*, species, collected by C. T. Greene at Blythedale, Md. Eight specimens, Hopkins No. 13630v, reared May 6, 1916, and October 18, 1915, from *Andricus flocci* Walsh on *Quercus minor* (?) Sargent, collected by A. B. Champlain at Lyme, Conn. Seven specimens, Hopkins No. 13676b, reared August 29, 1917, collected by L. C. Griffith in Georgia; no further data. Six specimens bearing Bureau of Entomology No. 3190^o, reared April 18, 1883, from a Cynipid gall on *Quercus*, species, collected by Barlow in Missouri. Thirty-two specimens Bureau of Entomology No. 3086^o, reared June

28 to July 24, 1883, from *Andricus seminator* Harris, with no further data. Two specimens, Hopkins No. 8699j⁷, reared July 7, 1912, from *Andricus seminator* Harris on *Quercus alba* Linnaeus, collected by A. D. Hopkins at Kanawha Station, W. Va. One specimen determined by Ashmead as *Syntomaspis advena* Osten Sacken and reared from *Andricus petiolicola* (Bassett) Mayr bearing Brodie No. 57. Three specimens from Louisiana with no further data other than labeled *Quercus*, species. In the author's collection there are three specimens, Hopkins No. 13685e, reared April 5, 1918, from *Disholcaspis globulus* (Fitch) on *Quercus alba* Linnaeus, collected by W. Middleton at Falls Church, Va. Six specimens reared from *Andricus seminator* (Harris) on *Quercus*, species, collected by A. E. Miller at Wooster, Ohio, July 27, 1920.

54. CALLIMOME MEXICANUM (Ashmead)

Figure 37

Torymus mexicanus ASHMEAD, Ent. News, vol. 10, 1889, p. 195.

The original description follows:

Female.—Length 4 mm; ovipositor 6.5 mm. Head and thorax metallic green, the hind margin of mesopleura violaceous followed by a bright cupreous band; abdomen bronzed black; flagellum black; scape, tegulae and tarsi bronzy-yellow; coxae metallic green; anterior femora toward base and the hind femora except tips, metallic brown, the rest of the legs rufous, wings hyaline. The veins, except the subcosta at base, dark brown. Head shagreened and punctate, the face clothed with a white pubescence; mandibles ferruginous, the teeth black. Thorax sparsely pubescent, transversely shagreened and punctured, the punctures more distinct and coarser along the hind margin of the pronotum, on the parapsides along the furrow of the same, and on the scutellum. Mesopleurae except the hind margin sculptured, the hind margin smooth, impunctate. Hind coxae large, reticulately sculptured. Abdomen finely or microscopically reticulated, the dorsal flap bluish.

Male.—Length 3.2 mm. Agrees well with the female in color and in the structure of the head and thorax, but the tegulae and head are bluish-green, the tibiae dark brown, the tarsi, except the terminal joint, whitish, while the abdomen is bluish-green, scarcely as long as the thorax, with the dorsal flap bright green.

I have examined the type series, which consists of two females and one male, in the National collection, and add the following:

The head and thorax are distinctly bronzy green with a shading into brown; thoracic furrows and the scutellar cross furrow are well defined; stigmal vein is sessile; propodeum with a V-shaped inverted carina.

Type locality.—Guanajuato, Mexico.

Host.—*Andricus championi* (Cameron) Ashmead.

Type.—Cat. No. 4306, U.S.N.M.

In the original description it is said that *mexicanum* was described from "one female." On the same page *Synergus dugesi* Ashmead was described from "one male and two female specimens." Examination of the types of both species shows that the number of speci-

mens of each species should be reversed. The museum type labels placed on these specimens by the describer proves that the published statement of the number of specimens is erroneous.

Distribution.—Guanajuato, Mexico (Type). In addition to the type series there are in the National collection nine specimens reared June 5, 1901, from a cynipid gall taken at Williams, Arizona, by H. S. Barber and E. A. Schwarz, and recorded under Bureau of Entomology No. 9411. Two specimens with the same data are in the author's collection.

The specimens from Arizona agree better than the types with the color given in the original description. The thoracic dorsum lacks the decided brownish tinge that is present in the types. Otherwise they are similar.

55. CALLIMOME COERULEUM Ashmead

Figure 40

Callimome coerulea ASHMEAD, Trans. Amer. Ent. Soc., vol. 9, 1881, Proc. p. xxxiii.

Torymys coeruleus (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 188.

Female.—Length 5.5 mm.; ovipositor 7 mm. Uniform indigo-blue with tints of green in some lights. Head strongly transverse and a little wider than the thorax at the tegulae; eyes red, bulging, the inner margins parallel, ocelli almost in a straight line; face below scape more or less polished and with a greenish luster; minutely reticulately punctuate and with numerous shallow impressions from which short white hairs arise; area just above the mouth finely reticulate; facial carina prominent, the lower half greenish, finely transversely rugose; scape yellowish, pedicel and rest of antennae brown, the funicle and club joints clothed with short keel-like hairs; all joints of funicle longer than wide, the first joint almost twice as long as pedicel and ring-joint together. Thorax rather robust, convex except the area centering around the dorsal groove that borders the anterior of scutellum; dorsum rather finely transversely rugose with a few shallow impressions from which whitish hairs arise; cross furrow on scutellum very prominent, the scutellar apex slightly polished; wings moderately ciliate, the stigmal vein dark brown and sessile; marginal vein two-thirds as long as the submarginal and both light brown; coxae same color as the thorax, the hind ones coarsely reticulately punctuate outwardly; trochanters, femora and tibiae testaceous, tarsi light yellow, except the ungues, which are fuscous; the hind femora with very minute denticulations on the lower margin beyond the middle. Abdomen not quite as long as the thorax, inclined to be carinate dorsally but very feebly so; a little darker than the thorax; conspicuously but not deeply reticulated.

Male.—Length 4 mm. Scape testaceous, flagellum fuscous; fore and mid femora greenish-brown with a violaceous tinge on the basal two-thirds; the hind femora more distinctly brown on the basal one-half, the other ends testaceous; tibiae testaceous.

Type locality.—Jacksonville, Fla.

Host.—*Amphibolips cinerea* Ashmead.

Type.—Cat. No. 2825, U.S.N.M.

This species is represented in the National collection by the type series which consists of two males and seven females from which I have redescribed it. One female paratype is in the author's collection.

Distribution.—In addition to the type series there are 11 specimens recorded under Bureau of Entomology 2302 and reared from galls on live oak collected at Crescent City, Fla., on June 18, 1880, by H. G. Hubbard; also two specimens of them labeled "Duval County, Fla."

56. *CALLIMOME CASTANOPSIDIS*, new species

Similar to Figure 41

Resembles *Callimome gahani* Huber but is larger and more robust; and the position of the ocelli differs.

Female.—Length 4 mm.; ovipositor 5 mm. Thorax moderately dark green with a bluish tinge in some lights; abdomen cyaneous with purplish tints. Head transverse and seven-ninths as long as wide; viewed from the front minutely reticulated and with several shallow irregularly placed impressions; purplish brown below the antennae and clothed sparsely with short white hairs; median carina below insertion of antennae low and wide, the antennal depression shallow; scape long, cylindrical and pale ferruginous; flagellum brown, the funicle and club clothed with very short closely set hairs; pedicel and ring-joint combined scarcely as long as first joint of funicle; all joints of funicle distinctly longer than wide and equal in width; ocelli brownish; the ocellocular line equal to the length of long diameter of posterior ocellus. Thorax robust and strongly arched, the dorsum minutely reticulately punctate and clothed sparsely with short white hairs that arise from shallow impression; parapsidal grooves not deep but well marked with shining black lines; scutellar cross furrow indicated by a shining blue line; scutellar apex as widely but not so deeply sculptured as the anterior of scutellum; propodeum feebly rugose longitudinally and somewhat polished, the anterior margin depressed and punctured on each side of a rather wide central area which is not pitted; fore coxae dark greenish brown, femora brown, the hind femora greenish brown; tibiae pale testaceous, the tarsi whitish yellow; veins of wings yellow, the marginal vein seven-tenths as long as the submarginal; stigmal vein sessile. Abdomen conspicuously but not deeply reticulated; moderately sub-

compressed, and as seen from the side rather strongly arched in the center; first four segments medially incised.

Male.—Length 2.6 mm. Antennae with all joints, except the last two, distinctly longer than wide and of equal width; scape brownish; tibiae brown, the hind ones fuscous. Abdomen with first segment green, the others purplish brown.

Type locality.—California.

Host.—Probably gall on *Castanopsis chrysophylla* by *Andricus castanopsidis* Beutenmueller.

Type.—Cat. No. 25337, U.S.N.M.

This species is described from 7 males and 16 females under Bureau of Entomology No. 3791* and reared from "large, globular, brown" galls, presumably collected by A. Koebele in California; exact data as to the locality is not available. The galls were not *in situ* when found. The adults emerged from November 16, 1885, to January 8, 1886. Also nine specimens under Koebele No. 320° and reared from galls on *Quercus lobata* collected August, 1890, at Glen Ellen, Sonoma County, Calif., by A. Koebele; two specimens under Koebele No. 549° and reared from galls on *Quercus dumosa* collected October, 1889, in Sonoma County, Calif., by A. Koebele; one specimen under Koebele No. 688, reared from a gall on *Quercus dumosa* collected February 20, 1891, in the Santa Cruz Mountains, California, by A. Koebele; three additional specimens from Sonoma County, Calif., under Koebele Nos., 544°, 545°, and 109°. The type, allotype, and 35 paratypes are in the United States National Museum, and a male and female paratype (Bureau No. 3791*) in the author's collection.

Attention is called to the fact that the host cited for the types was not determined. The description of the gall of *Andricus castanopsidis* Beutenmueller is somewhat similar to the description of the galls from which the parasites were reared.

57. CALLIMOME GIGANTICUM, new species

Figure 38

Closely resembles *Callimome melanocerae* (Ashmead) but is larger and the thoracic dorsum is differently sculptured.

Female.—Length 5.5 mm.; ovipositor 8 mm. Thoracic dorsum dull green and very minutely punctured. Head almost wide as thorax; face minutely reticulated and green with purplish reflections on each side of the median carina which extends as far as the margin of the mouth; face also with numerous shallow impressions; antennal depressions shallow and coppery within; scape long, a little flattened and testaceous; flagellum brown, the pedicel and ring-joint fuscous and shining; pedicel and ring-joint combined not more than three-fourths as long as the first joint of funicle; first joint of funicle twice

as long as wide, the sixth and seventh not quite one and one-half times as long as wide, all of equal width and clothed with short closely set hairs. Thoracic dorsum minutely punctate and with no or very few shallow irregularly placed impressions; clothed very sparsely with feeble hairs; parapsidal furrows shallow; central portion of dorsum unusually wide and flat, the posterior part of the mesoscutum very wide and more deeply punctured than the anterior; anterior margin of scutellum widely punctate, a slight longitudinal depression extending from the anterior margin back to the scutellar cross furrow; scutellar cross furrow well defined the apex as widely but not so deeply sculptured; propodeum more or less coarsely sculptured the anterior margin with several large pits and the carina extending about three-fifths the distance posteriorly, the central area posteriorly with several feebly developed folds; coxae dark greenish blue, the hind coxae brown with a purple tint outwardly above; femora dark greenish blue, except the tips, which are testaceous; tibiae testaceous, tarsi mostly yellow, the tips brown; wings sparsely ciliate, the marginal vein yellowish and five-sevenths as long as the submarginal which is brownish; stigmal vein sessile. Abdomen longer than the thorax and rather robust; two-thirds of basal segment shining green the apical portion brownish purple; rest of abdomen green with an undershade of brown and purple in some lights; first four segments deeply incised medially, the fifth with an unusually deep rounded incision.

Male.—Length 3.25 mm. Scape fuscous green; all joints of funicle longer than wide, the last joint very slightly longer. Thoracic dorsum with a purplish tinge in some lights; coxae, femora and hind tibiae green, with a tinge of dark purple; the other tibiae not so dark and somewhat testaceous at tips and inwardly.

Type locality.—Tepic, Mexico.

Allotype locality.—Grant's Pass, Oreg.

Host.—Cynipid gall on *Quercus*, species (Type). *Disholcaspis maculipennis* Gillette on *Quercus garryana* Douglas (Allotype).

Type.—Cat. No. 25317, U.S.N.M.

Described from several specimens. The type and allotype are deposited in the National collection. Six paratypes are in the author's collection.

Distribution.—Tepic, Mexico, Bureau Entomology No. 5722°. Type.

Allotype and two paratypes reared from *Disholcaspis maculipennis* Gillette on *Quercus garryana* Douglas, collected by A. C. Kinsey at Grant's Pass, Oreg., April 7, 1920. One specimen reared from *Andricus pacificus* Ashmead, on *Quercus chrysolepis* Liebmann, collected by Kinsey at Ukiah, Calif., March 17, 1920. Three specimens reared from *Disholcaspis corallina* (Bassett), collected at Merced Falls, Calif., by Kinsey.

There is some variation in color in this species. The thorax may have a purplish or a brassy tinge in some lights. In specimens that have been studied the sculpture is constant.

58. CALLIMOME MELANOCERAE Ashmead

Figure 34

Callimome melanocerae ASHMEAD, Trans. Amer. Ent. Soc., vol. 12, 1883, Proc., p. xiii, No. 10.

Callimome citrifformis ASHMEAD, Trans. Amer. Ent. Soc., vol. 12, 1885, Proc., p. xiii, No. 11.

Syntomaspis melanocerae (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Syntomaspis citrifformis (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Female.—Length 3.2 mm.; ovipositor 5.5 mm. Metallic green, the thoracic dorsum not punctate. Head wider than thorax, transverse, green, the face with a golden tinge and minutely reticulately rugose with several large shallow impressions; facial carina low but extending very near to clypeal margin; scape ferruginous, flagellum blackish; pedicel and ring-joint combined shorter than first funicle joint; the ocellocular line and lateral ocellar line about equal in length and not quite as long as the diameter of mid ocellus. Thoracic dorsum minutely transversely reticulately punctate, the mesoscutum conspicuously rugose, the scutellum more punctate, posterior margin of mesoscutum aeneous; scutellum somewhat longitudinally depressed and more finely punctured near the anterior margin; scutellar apex with shallow sculpture and shining; propodeum feebly rugose the anterior margin with small punctures; marginal veins two-thirds as long as submarginal, the stigmal vein sessile; coxae green and moderately clothed with white hairs, trochanters bronzy, inner sides of femora infuscated and with a purplish tinge, the exterior green and clearly reticulated, the outer tip ferruginous; tibiae ferruginous, the tarsi pale yellow. Abdomen nearly as wide as the thorax and about as long; feebly reticulated; first four segments feebly incised.

Type localities.—Jacksonville, Fla.

Host.—*Amphibolips melanocerae* (Ashmead).

Type.—Cat. No. 25345, U.S.N.M.

This species is redescribed from the type specimen. In addition to the type of *melanocerae* the National collection contains the type of *Callimome citrifformis* Ashmead (cited in synonymy above) reared from *Amphibolips citrifformis* (Ashmead) Dalla Torre, Jacksonville, Fla. These two types are similar in every respect. In Ashmead's description it is stated that in *Callimome citrifformis* the joints of the flagellum have an unusual character. Examination of the antennae revealed that they were still covered with the pupal sheath, which was probably unnoticed by Ashmead, hence his statement. *Callimome citrifformis* Ashmead bears the type Cat. No. 25346, U.S.N.M.

Distribution.—In addition to the type specimens mentioned above the National collection contains the following: Two specimens, Hopkins No. 15634a, reared November 9 to November 14, 1919, from *Disholcaspis terrestris* Weld on *Quercus margaretta* Ashmead, collected by L. H. Weld at Ocala, Fla. One specimen, Hopkins No. 15634b, reared May 12, 1920, from *Disholcaspis polita* Bassett on *Quercus chapmani* Sargent, collected by L. H. Weld at Ocala, Fla. Three specimens, Bureau of Entomology No. 989^a, reared September 12 to 28, 1881, from *Amphibolips globulus* Beutenmeuller from *Quercus*, species, Atlanta, Ga. One specimen, Hopkins No. 12072, reared June 27, 1914, from *Amphibolips inanis* Osten Sacken on *Quercus rubra* Linnaeus collected by W. Middleton at Plummer Island, Md. Two specimens, Hopkins No. 13608a, reared June 28 to August 9, 1915, from *Amphibolips coccinea* (Osten Sacken) Ashmead on *Quercus rubra* Linnaeus collected by W. Middleton at Falls Church, Va. Three specimens, Hopkins No. 12052a, reared June 13, 1914, by W. Middleton at Falls Church, Va. One specimen, Hopkins No. 12025, reared April 27, 1914, from *Disholcaspis globulus* Fitch on *Quercus alba* Linnaeus collected by W. Middleton, Falls Church, Va. One specimen, Bureau of Entomology No. 158^{zo}, reared February 13, 1884, from *Andricus flocci* Walsh on *Quercus macrocarpa* Michaux collected by A. Koebele at Washington, D. C. In the author's collection there is one specimen, Hopkins 12052a, with data as above.

59. CALLIMOME COCCINEUM, new species

Similar to figure 40

Most closely allied to *Callimome melanocerae* (Ashmead) but differs greatly in the type of the sculpture of the thorax and is smaller.

Female.—Length 3.5 mm.; ovipositor 5 mm. Thorax shining green with an aeneous tint in some lights; abdomen mostly green but with a definite purplish brown area in the center dorsally. Face bronzy below the antennae and sparsely clothed with feeble hairs; facial carina short but high and entirely green; scape testaceous, flagellum brown; pedicel and ring-joint equal to the first joint of funicle, all joints much longer than wide and of equal width; vertex green with tint of blue; eyes and ocelli red; posterior ocellus the length of its short diameter from the eye margin. Posterior margin of pronotum with a purplish band; dorsum finely and shallowly reticulated except for many and very conspicuous punctures from which short hairs arise; rugosity transverse on mesoscutum and irregular on the scutellum, except for the scutellar apex which is transverse; scutellum with a longitudinal depression through the center which is more finely reticulated and bluish; scutellar cross furrow very distinct; propodeum smooth, except an almost inconspicuous carina and several punctures on anterior margin; coxae dark green, hind femora dark green, except

the tips; fore and mid tibiae brownish except the tips; fore and mid tibiae testaceous, the hind tibiae rather strongly infusate; wings sparsely ciliate, veins pale testaceous, stigmal veins sessile. Abdomen shining dorsally, about as long as thorax and not as wide.

Male.—Unknown.

Type locality.—Falls Church, Va.

Host.—*Amphibolips coccinaeae* (Osten Sacken) Ashmead on *Quercus rubra* Linnaeus.

Type.—Cat. No. 28672, U.S.N.M.

Described from seven females.

Distribution.—Falls Church, Va. (type). Three specimens Hopkins 13607*c* (type) and *d* and *f*, and two specimens Hopkins No. 13608 *j* and *g*, reared August 9 to September 17, 1915, collected by W. Middleton and with data as above. These specimens are in the National collection. Two female paratypes reared September 3, 1918, from *Amphibolips confluentis* (Harris), collected at Blue Hills, Mass., by A. C. Kinsey, one of these in the author's collection.

60. CALLIMOME GAHANI, new species

Figure 35

Female.—Length 4 mm.; ovipositor 3.75 mm. Thorax robust, dorsum blue with tints of green and a few purplish spots in some lights; abdomen dark green. Face minutely reticulately rugose but with a few irregularly placed impunctations; blue green and with a few silvery hairs; facial carina transversely aciculated, the sides with short bristly hairs; antennae attached just a little below the middle, scape yellow and cylindrical; pedicel fuscous and about three times as long as the ring-joint which is one-third as long as wide; pedicel and ring-joint combined scarcely as long as the first joint of the funicle; flagellum brown with minute longitudinal keels arranged so as to give joints a double aspect; joints of funicle all longer than wide and of about equal length; eyes pinkish, ocelli amber; the ocellular line about one and one-fifth times the length of the long diameter or nearly twice the length of the short diameter of posterior ocellus; the lateral ocellar line exactly equal to the long diameter of post ocellus. Dorsum minutely reticulately punctate, and clothed with delicate hairs; parapsidal furrows deep and black; scutellum with a longitudinal depression which is more finely sculptured; scutellar cross furrow well defined, the apex of scutellum not so deeply sculptured; propodeum mostly smooth and shining; coxae fuscous blue; femora brownish inwardly and greenish brown outwardly and slightly pubescent; tibiae yellow; wings ciliate, veins yellow, except the stigmal vein which is brownish; stigmal vein sessile. Abdomen very feebly carinate dorsally; first four segments incised medially; area in region of first segment yellowish to light brown undershade.

Male.—Length 3.5 mm. Antennae darker than in female; tibiae light brown the hind ones darkest; submarginal veins distinctly brown, the marginal infuscated.

Type locality.—Ashland, Oreg.

Host.—*Cynipid* gall on *Quercus garryana* Douglas.

Type.—Cat. No. 25320, U.S.N.M.

Described from three specimens collected by J. M. Miller February 26, 1916, and recorded under Hopkins No. 12595f². The female type, male allotype, and male paratype are in the National collection.

61. CALLIMOME BRODIEI (Ashmead)

Figure 33

Syntomaspis brodiei ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187, No. 20.

Male.—Length 3.5 mm. Green, the thoracic dorsum with aeneous shades. Head transverse and minutely transversely punctate; face, below the antennae purplish brown and clothed sparsely with short white hairs; scape brownish green, flagellum fuscous; eyes reddish brown and rather strongly divergent toward the mouth; ocelli amber. Thoracic dorsum minutely transversely rugose and somewhat reticulated; sculptured with shallow impressions from which whitish hairs arise; scutellar cross furrow distinct but not deep, the scutellar apex slightly shining; mesonotum purplish green ventrally; coxae fuscous with a greenish tinge, femora lighter in color and the hind ones unusually hairy; tibiae yellow ferruginous, tarsi yellow. Abdomen flat dorsally but compressed ventrally; dark greenish brown and with long white hairs on the sides.

Female.—Facial carina scarcely evident; antennal depression shallow; pedicel and ring-joint combined not equal to first joint of funicle which is narrower than other funicle joints; joints of funicle gradually growing shorter toward the tip but all longer than wide, and except the first, of nearly equal width; ocelli light brown, the ocellular line about one and one-fourth times the length of the long diameter of the posterior ocellus; the lateral ocellar line hardly as long as the short diameter of a post ocellus; eyes reddish. Thoracic dorsum brown with bronzy and green tints; parapsidal furrows well marked but not deeply defined; scutellar cross furrow well defined, the scutellar apex as widely but not as deeply sculptured as the rest of scutellum; propodeum moderately sculptured, the anterior margin somewhat alveolate; carina conspicuous, and also with a few other longitudinal wrinkles and folds on the posterior half; all coxae dark bluish green; fore and mid femora fuscous, the hind femora greenish brown, except the tips; tibiae pale testaceous; veins of wings yellow, the stigmal veins sessile.

Type locality.—Toronto, Canada.

Host.—*Philonix pezomachoides* (Osten Sacken).

Type.—Cat. No. 25347, U.S.N.M.

This species was originally described from three specimens. It is now represented in the National collection by one male type and the head and thorax of a female allotype. I have redescribed it from these specimens. The gall of its host occurs on *Quercus alba* Linnaeus.

62. CALLIMOME AEREUM, new species

Similar to Figure 40

Female.—Length 3.75 mm.; ovipositor 2.75 mm. Thoracic dorsum aeneous. Face aeneous with tinges of purple; facial carina prominent; scape yellow, ferruginous and cylindrical; flagellum fuscous; the pedicel and ring-joint a little lighter and combined about the same length as the first joint of funicle; ring-joint four-fifths as long as wide; first joint of funicle one and three-fifths times as long as wide, the others gradually increasing in length toward the tip; last funicle joint very little longer than wide, all of equal width; head green below the foraminal margin; the ocellocular line slightly longer than the length of the long diameter of a posterior ocellus; the lateral ocellar line very distinctly shorter than the long diameter of posterior ocelli. Thoracic dorsum minutely transversely reticulately punctate and with a green tinge in some lights; parapsidal grooves green and well defined; scutellar cross furrow prominent; the scutellar apex as coarsely sculptured as before the cross furrow; propodeum coarsely sculptured, large punctures on the anterior one-fourth and with five or six well developed folds on the middle; prepectus and mesopleura indigote; coxae dark green, the femora brown with a shading of blue and green, except the tips which are testaceous; tibiae testaceous, tarsi whitish to testaceous; wings ciliate; marginal vein four-fifths as long as the submarginal, stigmal vein sessile. Abdomen as long and about as wide as the thorax; shining dark green with a purplish brown tint in some lights; margins of segments conspicuously shining; first four segments medially incised.

Male.—Length 3 mm. Carina on propodeum more conspicuous than in female. Abdomen much shorter than the thorax.

Type locality.—Boerne, Tex.

Host.—Leaf gall on *Quercus schneckii* Britton.

Type.—Cat. No. 25339, U.S.N.M.

Described from a large number of specimens, as indicated below, which are deposited in the National collection.

Distribution.—Two females and 12 males, Hopkins No. 13686c, reared August 20, 1918; two of the above number reared December 10, 1917, from the host mentioned above and collected by L. H. Weld,

at Boerne, Tex. Eighteen specimens, Hopkins No. 15634*g*, reared December 13, 1919, to November 23, 1920, from leaf galls on *Quercus laurifolia* (Michaux) at Dayton, Fla. Two specimens, Hopkins No. 10776*a*, reared May 14, 1919, from *Disholcaspis fasciata* Bassett on *Quercus rubra* collected at Ironton, Mo., by S. A. Rohwer. Sixteen specimens, Hopkins No. 1129*a* (and supernumbers) from Texarkana, Ark. Two specimens, Hopkins No. 12099, reared November 24, 1915, from *Disholcaspis fasciata* Bassett on *Quercus digitata* Sudworth, at Falls Church, Va., by W. Middleton. Thirty-eight specimens, mounted on compound points, reared from galls on *Quercus macrocarpa* Michaux (?) and recorded under Bureau of Entomology No. 435, collected near Washington, D. C. In addition to the above listed specimens in the National collection, two paratypes under Hopkins No. 13686*c* are in the author's collection.

63. *CALLIMOME ROBUSTUM*, new species

Similar to Figure 40

Female.—Length 4.5 mm.; ovipositor 3 mm. Head as wide as the thorax; viewed from the front bronzy brown; facial carina feebly developed; scape attached below the middle of the front, yellow, cylindrical, the flagellum dark brown, the pedicel shining and blackish; pedicel and ring-joint combined not as long as the first joint of funicle; pedicel three-fifths as wide as the first joint of funicle, the flagellum gradually increasing in width toward the tip; eyes prominent, slightly convergent toward the vertex. Thoracic dorsum bronzy with a green reflection; pronotum distinctly margined with a shining band; mesoscutum reticulately rugose and quite densely clothed with short semi-erect hairs; parapsidal grooves deep; axillae gradually rounded following the general contour of thorax; scutellum similarly sculptured, the cross furrow quite distinct and the apex somewhat shining; propodeum coarsely sculptured especially at the anterior margin where the pits are much longer than wide and extend two-fifths the distance posteriorly; area behind pits coarsely punctured and with several longitudinal wrinkles; coxae and femora, except the tips of the latter, dark green, the coxae and femora exceptionally deeply reticulated, the sculpture on the latter as deep as on the dorsum; femora slightly pubescent; tarsi yellowish-white; tibiae yellowish; wings moderately ciliate, veins yellow, stigmal vein sessile. Abdomen as long as thorax, flattened, and very dark green; first three segments incised dorsally, the fourth only slightly so; ovipositor one-third longer than the abdomen.

Male.—Unknown.

Type locality.—Carrabelle, Fla.

Host.—*Amphibolips fuliginosa* Ashmead; *Quercus phellos* Linnaeus or *laurifolia* (Michaux).

Type.—Cat. No. 25348, U.S.N.M.

Described from six (one type) females recorded under Hopkins No. 15633f and reared May 12 to September 1, 1920, from material collected by L. H. Weld. Type and four paratypes in the National collection; one paratype in the author's collection.

64. CALLIMOME BICOLORATUM, new species

Figure 14

Female.—Length 3.5 mm.; ovipositor 5 mm. Head and thorax blue-green and finely punctate; abdomen brownish bronze. Head as wide as the thorax, the face reticulately rugose and with a few larger but shallow punctures; silvery hairs quite numerous below the antennae; scape slender, straight, yellow, the flagellum brown; pedicel shining and together with the ring-joint longer than the first joint of funicle; all funicular joints not as long as wide but of nearly equal width; ring-joint as wide as long; two rows of hairs regularly arranged around each joint; eyes and ocelli red; post ocellar line nearly equal to thrice the length of the lateral ocellar line. Thoracic dorsum mostly minutely punctate but also with a few large shallow impressions; scutellum with a longitudinal line through the center due to finer punctation; scutellar cross furrow hardly apparent, the scutellar apex very slightly shining; propodeum polished, a few longitudinal carina at the lower exterior margin and some pits at the anterior margin; coxae and femora, except the tips of the first and second, light brown with a slight brassy green reflection; the hind coxae darker, the tibiae testaceous and the tarsi yellowish; pleura smooth and coppery; wings ciliate, veins yellowish, marginal vein two-thirds as long as the submarginal, the stigmal vein sessile. Abdomen distinctly longer than the thorax but not quite as long as the head and thorax combined, somewhat subcompressed but not carinate dorsally; first, second, and third segments deeply incised medially.

Male.—Length 2 mm. Scape greenish on the upper half; all funicle joints but the first and second wider than long; legs darker than in female. Abdomen depressed and shorter than the thorax.

Type locality.—Fort Grant, Ariz.

Host.—*Amphibolips trizonata* Ashmead on *Quercus*, species.

Type.—Cat. No. 25338, U.S.N.M.

Described from six females and nine males reared July, 1882, to January 10, 1883, from galls collected by H. K. Morrison and recorded under Bureau of Entomology No. 2668⁰⁰ and ⁰¹; and six specimens reared August 14, 1889, from *Rhodites bicolor* Harris, collected at Aztec, N. Mex.; four paratypes are in the author's collection; others of the type series in the National collection.

65. *CALLIMOME HIRSUTUM*, new species

Figure 20

Female.—Length 2.75 mm.; ovipositor 3.75 mm. Metallic green. Head transverse and as wide as thorax; face finely reticulately rugose below the antennae, vertically rugose above antennae to ocelli; densely clothed with short stout silvery white hairs; carina very prominent extending from between the antennae, where it is sharp and narrow, to the margin of the clypeus its median area being high and wide; scape tawny, flagellum light brown; all joints of funicle longer than wide; pedicel and first joint of funicle about equal in length, the ring-joint twice as wide as long; second joint of funicle one-fourth longer than first but slightly shorter than the third; ocelli and eyes reddish brown; posterior ocellus one and one-fourth times its diameter from the eye margin. Thoracic dorsum densely clothed with white hairs as on the head, the hairs longer on the sides of the pronotum; finely reticulately rugose; the parapsidal and other grooves distinct; scutellar cross furrow well defined although not deep; the scutellar apex distinctly but not deeply sculptured, and hence polished; coxae and femora blue green, the latter brown inwardly; tibiae brown, greenish tinge on the outside; tarsi whitish yellow, the last joint brown; wings moderately ciliate; marginal vein three-fifths as long as the marginal, the stigmal vein sessile. Abdomen dark brownish green; strongly subcompressed, the first four segments strongly carinate; the posterior segments densely clothed with hairs as on the thorax and head.

Male.—Length 2 mm. Scape stout; carina not touching margin of clypeus; tibiae darker than in female. Abdomen much shorter than the thorax.

Type locality.—Redington, Ariz.

Host.—Twig gall on *Quercus*, species.

Tyre.—Cat. No. 25331, U.S.N.M.

Described from two females and one male, Hopkins No. 13643y, reared, July 13 to July 29, 1916, from galls collected by M. Chrisman. The female type and male allotype are in the National collection. Paratype female in the author's collection.

66. *CALLIMOME CAPILLACEUM*, new species

Figure 21

Female.—Length 2.5 mm; ovipositor 2 mm. Metallic greenish-brown. Head transverse and slightly wider than the thorax; viewed from the front somewhat triangular; reticulately rugose and rather densely clothed with short, stout, white hairs; facial carina extending nearly two-thirds the distance to the margin of mouth; scape yellow, long, and slender, reaching to the lower margin of median ocellus, the flagellum light brown; ring-joint twice as wide as long, the pedicel

nearly as wide as first joint of funicle and longer; funicle joints equal in length but gradually increasing in width toward the tip, each joint with a single row of regularly arranged and widely placed yellowish hairs; eyes brownish and widely divergent below; ocelli amber; median ocellus considerably larger than the posterior ocelli; vertex more coarsely rugose and a distinct greenish-brown. Thorax rather robust, the dorsum minutely aciculate rugose; parapsidal grooves represented by rather shallow black lines so that the reticulations appear to continue from one sclerite to the other; scutellum somewhat elevated at the anterior margin and rounded dorsally; scutellar cross furrow beyond the posterior one-third; scutellar apex as coarsely but not so deeply sculptured appearing polished at certain angles; mesoscutum and scapulae densely clothed with silvery hairs, the hairs less dense on the scutellum; coxae, trochanters, and femora greenish-brown, the femora slightly pubescent; tibiae yellowish, tips of tarsi brown; wings moderately ciliate, veins very pale yellow, the marginal vein about three-fourths as long as the submarginal, and the stigmal vein sessile. Abdomen longer than thorax; dark metallic green; almost flat dorsally; the first four segments medially incised; brown ventrally; ovipositor about one and one-half times as long as abdomen.

Male.—Unknown.

Type locality.—Fort Grant, Ariz.

Host.—Cecidomyid galls on stems of *Artemisia*, species.

Type.—Cat. No. 25330, U.S.N.M.

Described from nine females reared from galls collected by H. K. Morrison and recorded under Bureau of Entomology No. 2732°. The type female and six paratypes are in the collection of the United States National Museum. Two paratypes are in the author's collection.

67. CALLIMOME HAINESI (Ashmead)

Figure 12

Torymus hainesi ASHMEAD, Ent. News, vol. 4, 1893, p. 278.

Callimome asphondyliae GAHAN, Ann. Ent. Soc. Amer., vol. 12, 1919, pp. 161-2, not (*Torymus*) *Callimome asphondyliae* Kieffer and Jörgensen.

The following description, except for the single word in parenthesis, is Gahan's original:

Female.—Length 2.25 mm. Head and thorax shagreened above; face below antennae less strongly sculptured than the vertex; antennae rather short and thick; funicle joints subequal in length, but increasing slightly in breadth the apex and all joints broader than long, the first only slightly so, the last about half as long as thick; club not as long as the three preceding joints of funicle; ocelli in a low triangle, the lateral ocellus separated from the eye margin by about the long diameter of the ocellus; parapsidal grooves complete, but weakly impressed posteriorly; propodeum without carinae and uniformly shagreened, the sculpture not as strong as on the scutellum; hind femora outwardly sculptured about like the propodeum; wings sparsely ciliated the cilia more or less arranged in rows; stigmal vein very short (*sessile*), postmarginal also short; abdomen about equal

to the thorax in length, the first tergite smooth, other tergites weakly sculptured, more strongly so at the sides; ovipositor extending beyond apex of abdomen about one and one-third times the length of the abdomen. Color dull blackish green, the head and thorax sparsely clothed with silvery white hairs; eyes pale reddish; face, propodeum and hind femora and the abdomen more strongly metallic than the dorsum of the thorax; sides of thorax and hind coxae bluish; antennal scape and all tibiae and tarsi brownish testaceous; flagellum, median and front femora, tarsal claws and ovipositor sheaths brownish black; wings hyaline; venation pale brownish.

Male.—Length 2 mm. Tibiae all dark brown. Otherwise agrees with the female except the general color is perhaps a little darker.

Additional notes: The scutellar cross furrow is so inconspicuous that it can be seen only with difficulty, and is best indicated by a difference in the depth of sculpture before and behind it.

Type locality.—San Julio, Lower California.

Host.—*Asphondylia websteri* Felt.

Type.—Cat. No. 25333, U.S.N.M.

Torymus hainesi was described from three specimens taken in April, 1889, by C. D. Haines. The type series is represented by one female in the National collection and two specimens in the Museum of the California Academy.

Distribution.—In addition to the type of *hainesi* I have examined the following: Six females and two males reared at Tempe, Ariz., from the alfalfa midge (*Asphondylia websteri* Felt), these are the types *Callimome asphondyliae* Gahan and recorded under Type, Cat. 22296, U.S.N.M. Five males and one female reared from mesquite bean moth, July, 1913, Austin, Tex., collected by C. Hartman, are also in the National collection.

68. CALLIMOME TARSALE, new species

Figure 18

Female.—Length 2.75 mm.; ovipositor 2 mm. Thorax green with a brassy tint in some lights; face below antennae bronzy and finely sculptured but with numerous and rather strongly impressed umbilications; facial carina moderately developed, the upper half green and the lower half bronzy; metallic green above the antennae; eyes reddish and the ocelli reddish brown; scape yellow and not extending to the median ocellus; flagellum brown, the pedicel and ring-joint lighter brown than the funicle; pedicel and ring-joint combined about equal to the length of the first joint of funicle, which is about one-half longer than wide; the last funicular joint slightly wider than long. Thorax five-sixths as wide as head; pronotum and mesoscutum transversely rugose the scutellum concentrically rugose; hairs on dorsum scarcely apparent; scutellar cross furrow not strongly impressed and not dividing the scutellum at the apical one-third; scutellar apex very slightly polished at certain angles; propodeum with a rather square area in the middle with longitudinal rugosity and with rather strong

carinae on each side of the rectangular area and alveolate anteriorly; fore and mid coxae yellowish, with a tint of brown, the hind coxae with a purplish tinge; femora and tibiae all yellow, the tarsi whitish yellow; pleura and mesosternum brownish; wings moderately ciliate, veins pale yellow; marginal vein five-sixths as long as the submarginal and the stigmal vein sessile. Abdomen as long as the head and thorax combined and very slightly subcompressed; first three segments greenish, the remaining brownish green; fuscous ventrally.

Male.—Length 2.25 mm. Coxae, femora and tibiae all brown except the tips which are ferruginous. Abdomen depressed dorsally and shorter than the thorax.

Type locality.—Corpus Christi, Tex.

Host.—Cecidomyid ? gall on *Celtis*, species.

Type.—Cat. No. 25340, U.S.N.M.

Described from four females and seven males reared May 27 to July 3, 1895, and recorded under Bureau of Entomology No. 6626°. The female type, male allotype, and seven paratypes are deposited in the National collection. Two paratypes are in the author's collection.

The gall made by the host is described as "more or less globular when single, with a short nipple, pubescent."

69. CALLIMOME MONTSEERRATI (Crawford)

Figure 2

Torymus montseerrati CRAWFORD, Proc. U. S. Nat. Mus., vol. 40, 1911, p. 441.

Type locality.—Montserrat, West Indies.

Host.—Unknown.

Type.—Cat. No. 13658, U.S.N.M.

Type series in the United States National Museum contains two females and three males. Two specimens not labeled as type material are in the same lot.

70. CALLIMOME SATIVAE, new name

Figure 13

Syntomaspis medicaginis GAHAN, Ann. Ent. Soc. Amer., vol. 12, 1919, p. 162, preoccupied by *Torymus medicaginis* Mayr, Verh. zool. bot. Ges. Wien., vol. 24, 1874, p. 127.

Type locality.—Tempe, Ariz.

Host.—*Asphondylia websteri* Felt.

Type.—Cat. No. 22297, U.S.N.M.

Represented in the National collection as follows: Type females reared by V. L. Wildermuth from galls of the alfalfa midge, Webster No. 7268, Tempe No. 2264. One paratype with the same data, except Tempe No. 2251. Allotype, four male paratypes, and five female paratypes reared by E. G. Smyth at Tempe, Ariz., from galls of the same insects and recorded under the same Webster number. The wing of a female paratype is mounted on a slide. Stigmal vein sessile.

71. CALLIMOME RUBENIDIS, new species

Figure 15

Female.—Length 2.75 mm.; ovipositor 2.25 mm. Head as wide as the thorax; face below the antennae bronzy green, minutely reticulated and with a few large shallow impressions; rather densely clothed with short white hairs; facial carina extending one-half the distance to the mouth; vertex inaurate in some lights; scape yellowish, flagellum fuscous; pedicel and ring-joint longer than first joint of funicle, the first and second funicle joints longer than wide, the rest gradually growing shorter until they appear almost square; eyes maroon; foraminal margin brassy beneath. Thoracic dorsum green with a slight brassy tinge, minutely reticulately punctate and with a few large shallow impressions; scutellar cross furrow indicated by a shining line, the scutellar apex not so deeply sculptured as other parts of the scutellum and hence polished; propodeum moderately reticulated, the central area brassy, lateral folds at lower margin rather prominent; coxae purplish and depressed outside, femora and tibiae brown, except the tips of the latter which are yellowish; last joints of tarsi brown; wings moderately ciliate; marginal vein five-sevenths as long as submarginal; stigmal vein fuscous and sessile. Abdomen slightly longer than the thorax, dark green with aeneous tint; not strongly subcompressed.

Male.—Length 2 mm. Scape greenish brown, the flagellum very dark; legs entirely fuscous, except the coxae which are greenish. Abdomen depressed and shorter than the thorax.

Type locality.—Manitou, Colo.

Host.—*Disholcaspis rubens* Gillette on Scrub White Oak.

Type.—Cat. No. 25335, U.S.N.M.

Described from six females and one male. The type and three paratypes are recorded under Hopkins No. 13604c and were reared May 3 (type) to June 4, 1915, by W. Middleton. The male allotype and one paratype from the same locality and host are recorded under Hopkins No 12089m and were reared April 1, 1915 from galls collected by A. B. Champlain. One female paratype, Hopkins No. 13604c, is in the author's collection.

72. CALLIMOME MINUTISSIMUM, new species

Figure 16

Female.—Length 2.25 mm.; ovipositor 2 mm. Green, the thorax brighter than the abdomen. Head as wide as thorax, the face finely sculptured; facial carina extending half the distance to mouth; scape yellow testaceous, flagellum brown, the first and second joints of funicle longer than wide, the others gradually growing wider toward the tip; antennal depression shallow, scarcely defined. Thorax bright green with a brassy reflection in some lights; minutely

punctate with a tendency to rugosity; parapsidal furrows and scutellar cross furrow distinct; the scutellar apex not so deeply sculptured and hence somewhat shining. Propodeum feebly reticulated and without a carina but with slight depressions on each side of the middle posteriorly; coxae dark green, femora and hind tibiae fuscous with a greenish tinge in some lights; tips of femora and tibiae dark testaceous; the tarsi yellowish; wings moderately ciliate; the marginal vein five-sixths as long as the submarginal; the stigmal vein more or less sessile. Abdomen dark brownish green; segments medially emarginate.

Male.—Unknown.

Type locality.—Yosemite Park, Calif.

Host.—Twig gall on *Quercus*, species.

Type.—Cat. No. 25342, U.S.N.M.

Described from three females recorded under Hopkins No. 13341e, reared August 20, 1919, by J. E. Patterson. Two specimens are in the National collection; one paratype is in the author's collection.

73. CALLIMOME OCCIDENTALE, new species

Figure 32

Female.—Length 3.75 mm.; ovipositor 4.5 mm. Head not strongly transverse and scarcely as wide as the thorax; bluish green; facial carina low and broad and extending three-fifths the distance to margin of mouth; vertex finely reticulately rugose with some shallow impressions; the vertex roughly rectangular and more deeply reticulately rugose; antennal depression rather deep; ocelli light brown, prominent, the posterior ocelli about the diameter of one of them from the eye margin; eyes pinkish; scape below the middle of the face, dark green with slight brownish tints, the pedicel same color; ring-joint nearly rectangular, and combined with the pedicel longer than first funicle joint; joints of funicle gradually growing shorter toward the tip where they are almost rectangular. Thoracic dorsum minutely reticulately rugose, shallow impressions scarcely perceptible; clothed with pinkish-white hairs seen only in certain lights; scutellar cross furrow not deeply impressed; parapsidal furrows very deep; middle of scutellum with a longitudinal convexity and with a row of impressions on each side of it; scutellar apex strongly shining and with a bluish tint, slightly purplish in some lights; propodeum shining; coxae and femora brown with a tinge of blue, tibiae brown with bluish reflections, tarsi whitish with yellow tips; wings moderately ciliate, veins very pale yellow; the marginal vein about five-sevenths as long as submarginal, stigmal vein sessile. Abdomen dark green and two-sevenths longer than the thorax; segments somewhat medially emarginate and all but last one strongly incised; ovipositor longer than the body.

Male.—Length 2.25 mm. Similar to female but uniformly darker.

Type locality.—Hilt, Calif.

Host.—Dipterous galls on *Juniperus occidentalis* Hooker.

Type.—Cat. No. 25332, U.S.N.M.

Described from ten specimens as follows: Female type and four male paratypes recorded under Hopkins No. 12513c⁶ were reared May 20, 1914, from material collected in the type locality by P. D. Sargent. Male allotype and three paratypes under Hopkins 12513c⁴, with same data. One specimen recorded under Hopkins No. 13342d was reared August 1, 1917, from galls on *Juniperus occidentalis* collected at Yosemite Park, Calif., by J. E. Patterson. Two specimens, bearing Hopkins Nos. 12513c⁴ and 12513c⁶, are in the author's collection.

74. CALLIMOME ALBITARSE, new species

Figure 28

Most closely allied to *Callimome occidentale* Huber.

Female.—Length 3.5 mm.; ovipositor 3 mm. Thorax bright green, the abdomen darker green. Head as wide as thorax and about as long as wide; clypeus anteriorly produced and with two very noticeable incisions in the margin toward the center; face rather densely clothed with white appressed hairs; scape greenish-brown, somewhat testaceous at the base; flagellum brownish, the pedicel purplish-brown; ring-joint almost as long as wide and combined with the pedicel a little longer than the first joint of funicle; joints of funicle gradually growing shorter toward the tip, the last two slightly wider than long; the distance between the median ocellus and a posterior ocellus a little less than the distance between a posterior ocellus and the eye margin; eyes reddish, the ocelli amber. Thoracic dorsum uniformly minutely transversely reticulately rugose, there being no large shallow impressions; parapsidal furrows very indistinct; cross furrow on the scutellum well defined, the scutellar apex more finely rugose; scutellum roundly convex; propodeum polished but with a few shallow pits on the anterior margin; coxae and femora bluish-green; fore tibiae fuscous in the middle, the mid and hind tibiae also fuscous, the tips of the middle tibiae castaneous; wings moderately ciliate, veins yellow; the marginal vein three-fourths as long as submarginal and the stigmal vein sessile. Abdomen very much longer than the thorax; first three segments deeply incised dorsally, the fourth feebly incised; all segments uniformly dark green; ovipositor longer than abdomen.

Male.—Unknown.

Type locality.—Riley County, Kans.

Host.—Gall on *Solidago rigida* Linnaeus.

Type.—Cat. No. 25327, U.S.N.M.

Described from four females reared June to October by C. L. Marlatt. The types and two paratypes are in the National collection; one paratype is in the author's collection. For this species I have retained the manuscript name given it by Ashmead.

75. CALLIMOME WARRENI (Cockerell)

Figure 36

Syntomaspis warreni COCKERELL, Ent, News, vol. 20, 1911, p. 82.

Except for a few minor omissions and changes the original description of the female is as follows:

Female.—Length 4.3 mm.; ovipositor 5.4 mm. Bluish-purple with strong tints of crimson. Head transverse, peacock green with faint crimson tints, the frontal depressions behind the antennae shining golden; eyes bright terra cotta red; sides of face very minutely rugosopunctate, sides of front becoming striatulate; scape and ring-joint ferruginous, flagellum black, the joints of funicle minutely longitudinally keeled. Thoracic dorsum with large thimble-like punctures, variegated with green and crimson; posterior part of scutellum minutely granular, with microscopical punctures, and with a marginal sulcus crossed by fine ridges; scutellar cross furrow very prominent; anterior coxae brilliant green, the hind coxae crimson-purple; femora and tibiae bright chestnut red; tarsi yellowish, rufescent subapically, black at apex; lower margin of hind femora minutely denticulate beyond the middle; veins of wings fulvo-ferruginous, the stigmal vein sessile. Abdomen brilliant magenta, with purple shades; first three segments deeply incised medially and inclined to be carinate.

Type locality.—Trinidad, Colo.

Host.—(*Holcaspis*) *Disholcaspis*, species on *Quercus undulata* Torrey.

Type.—Cat. No. 13362, U.S.N.M.

Male.—Length 3.25 mm. Scape greenish-brown; joints of funicle longer than wide; femora bluish-purplish with crimson tints in some lights; fore tibiae infusate in middle, mid tibiae purplish, hind tibiae dark testaceous with a strong crimson-purplish tinge outwardly. Abdomen short and depressed.

Described from two males recorded under Hopkins, No. 13604c and reared by W. Middleton June 15, 1915, from *Disholcaspis rubens* Gillette on scrub white oak collected at Manitou, Colo.

Distribution.—Trinidad, Colo. (type). Manitou, Colo. (males described above). The following are also represented in the National collection: Two specimens, Hopkins No. 10773u, reared June 26, 1919, from *Disholcaspis rubens* Gillette on *Quercus gambelli* Nuttall, collected by J. H. Pollock at Colorado Springs, Colo. Two specimens, Hopkins No. 10781s, reared July 9 to August 7, 1919, from a twig gall on *Quercus oblongifolia* Torrey, collected by G. Hofer at Sycamore Flat, Ariz. One specimen, Hopkins No. 15604a, reared July 15 to August 17,

1918, from galls collected by L. H. Weld at Prescott, Ariz. Two specimens, Bureau of Entomology No. 2643⁰¹, reared June 30, 1882, from a Cynipid twig gall on *Quercus virginiana* Miller, collected by H. K. Morrison at Fort Grant, Ariz. Eight specimens, Hopkins No. 1378l, reared February 28, 1906, from a bud stem gall on *Quercus virginiana* Miller, collected by A. C. Morgan at Giddings, Tex. One specimen, Hopkins No. 13685a, reared June 1, 1918, from *Disholcaspis cinerosa* Bassett on *Quercus virginiana* Miller, collected by L. H. Weld at Wharton Tex. Two specimens, Hopkins No. 13686e, reared July 15, 1918, from *Disholcaspis spongiosa* Karsch, on *Quercus minor* Sargent, collected by L. H. Weld, presumably in Texas. In the author's collection there is one specimen bearing Hopkins No. 10781s.

76. CALLIMOME RACEMAREAE Ashmead

Figure 39

Callimome racemareae ASHMEAD, Trans. Amer. Ent. Soc., vol. 9, 1881, Proc., p. xxxiii.

Syntomaspis racemareae (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Female.—Length 5 mm.; ovipositor 11 mm. Dark bluish-purple, shining in reflected light. Head transverse, wide as thorax and two-thirds as long as wide; face iridescent bluish-purple with a tint of green, the lower half most densely clothed with whitish pile; facial carina prominent and extending one-half the distance to margin of mouth; scape ferruginous to yellow and scarcely attaining the posterior ocellus which is located at the apex of antennal depression; pedicel ferruginous, rest of antennae black; scape, ring-joint, and pedicel equal to first three joints of funicle; joints of funicle all distinctly longer than wide and of equal width. Thorax with a crimson-purplish tinge ventrally; dorsum clothed with rather long semirecumbent whitish hairs and very coarsely and irregularly punctate, the space between the punctures being rugose and shining; scutellum not so deeply punctured as the mesoscutum and slightly depressed medially; scutellar apex striolate reticulate and without large punctures or hairs; parapsidal furrows distinct, the cross furrow on the scutellum well defined; propodeum carinated and with very large ridges and pits on anterior; coxae crimson-purplish with tinge of green in some light; femora and tibiae castaneous, tarsi whitish the last two joints brown; hind femora with very minute denticulations on the lower margin beyond the middle and clothed sparsely with long white hairs; wings moderately ciliate, veins brown; the submarginal vein not quite twice as long as the marginal, the stigmal vein sessile. Abdomen distinctly shorter than the thorax; posterior margins of tergites purplish, the anterior margins green; first four segments feebly carinated and deeply incised medially.

Male.—Length 3.75 mm. Body mostly green but cyanescent. First joint of funicle about four times as long as the pedicel and ring-joint combined; front and middle coxae brownish, the hind coxae brown at tips; femora greenish-purple, fuscous in some lights, the hind ones darkest; tibiae light brown on the outside with a crimson-green tint in some lights. Abdomen shining green and depressed.

Type locality.—Jacksonville, Fla.

Host.—*Amphibolips racemaria* Ashmead.

Type.—Cat. No. 2824, U.S.N.M.

This species is represented in the National collection by the single female type which I have redescribed above. The allotype male has apparently been lost. The above description of the male is based on a specimen reared September 1, 1920, from *Disholcaspis terristris* Weld on *Quercus margareta* Ashe collected by L. H. Weld at Ocala, Fla., and recorded under Hopkins U. S. No. 15634a.

The color tints of this species vary considerably, depending to a great extent upon the light. In color it is very similar to *Callimome cinerosum* Huber; however, it is readily separated from this species by the difference in the sculpture of the propodeum and the thoracic dorsum.

Distribution.—Jacksonville, Fla. (Type). The following specimens are in the United States National Museum: Three specimens, Hopkins No. 15634a, reared September 1, 1920, from *Disholcaspis terristris* on *Quercus margareta* Ashe, collected by L. H. Weld at Ocala, Fla. One specimen reared from *Amphibolips fuliginosa* Ashmead collected at Tallahassee, Fla., and bearing No. 1175. Two specimens, Hopkins No. 15632b reared June 3, 1920, from *Amphibolips prunus* Walsh on *Quercus*, species, collected by L. H. Weld in Alabama and Florida. Seven specimens, Hopkins No. 15632a, reared September 1, 1920, from *Disholcaspis fasciata* Bassett on *Quercus*, species, collected by L. H. Weld in Alabama and Florida. Two specimens, Hopkins No. 13686b, reared August 15, 1918, from *Amphibolips gainesi* Bassett, on *Quercus schneckii* Britton, collected by L. H. Weld at Boerne, Tex. Three specimens, Hopkins No. 13685a, reared August 1 to September 6, 1918, from *Disholcaspis cinerosa* Bassett on *Quercus virginiana* Miller, collected by L. H. Weld at Wharton, Tex. One specimen reared from *Amphibolips q-prunus* Walsh on *Quercus margareta* Ashe, Fla. Two specimens, Hopkins No. 12072, reared June 29, 1914, from *Amphibolips q-inanis* Osten Sacken on *Quercus rubra* Linnaeus collected by W. Middleton at Plummer Island, Md. Three specimens from New Brunswick, N. J., and one specimen from Waterbury, Conn., which bear no additional data. Two specimens, Hopkins No. 12039, reared May 26, 1914, from *Disholcaspis rugosa* Bassett on *Quercus minor* Sargent (*Quercus stellata* Wangenheim) collected by W. Middleton at Falls Church, Va. One specimen, Hopkins No. 12039, reared

July 29, 1914, from *Disholcaspis rugosa* (Bassett) on *Quercus alba* Linnaeus collected by S. A. Rohwer at Falls Church, Va. Two specimens, Hopkins No. 13685e, reared February 26, 1918, and January 15, 1919, from *Disholcaspis globulus* Fitch on *Quercus alba* Linnaeus collected by W. Middleton at Falls Church, Va. Four specimens, Hopkins No. 12070s reared May 20 to July 29, 1914, from *Disholcaspis globulus* (Fitch) on *Quercus alba* Linnaeus collected by W. Middleton at Falls Church, Va. In the author's collection there is one specimen labeled November 22, 1919, reared from *Amphibolips gainesi* Bassett collected by A. L. Kinsey at Hearne, Tex.; and one specimen from the Thompson collection reared from *Amphibolips confluentis* Harris, R. I.

77. CALLIMOME CINEROSUM, new species

Similar to Figure 40

Closely allied to *Callimome racemareae* (Ashmead), from which it differs by having no carina, by having very small pits on the propodeum, and a differently sculptured scutellar apex.

Female.—Length 5.25 mm.; ovipositor 8.5 mm. Uniform indigo-blue tinged with green in some lights. Head wider than long, viewed from front densely clothed with long, appressed, white hairs below the antennae; facial carina reaching three-fourths the distance to the margin of the mouth and transversely minutely aciculated; scape testaceous, flagellum black; pedicel short, robust, not half as long as first funicle joint; ring-joint about four times as wide as long; all joints of funicle longer than wide and of equal width, and clothed with very closely set short hairs; ocelli amber, eyes red; the ocellular line one and one-half times the diameter of posterior ocellus, and the lateral ocellar line about as long as the diameter of an ocellus. Thoracic dorsum with large umbilicate punctures; mesoscutum robust through the central part, the parapsidal furrows deep; space between the large punctures finely reticulated; scutellum wide, rather flat and not so deeply and thickly sculptured as the mesoscutum; scutellar cross furrow deep, the apex finely reticulated; propodeum rather moderately sculptured, with small pits on the anterior margin and without a carina; fore coxae brownish-blue, mid coxae indigote with a tinge of blue and green, the hind coxae indigote with a purplish tint; femora and tibiae dark testaceous, the hind femora minutely denticulate on the lower margin and somewhat swollen; tarsi yellow ferruginous; stigmal vein sessile. Abdomen purplish-blue with greenish tints in some lights; first four segments weakly carinate and medially incised.

Male.—Unknown.

Type locality.—Victoria, Tex.

Host.—*Disholcaspis cinerosa* Bassett on *Quercus virginiana* Miller.

Type.—Cat. No. 25322, U.S.N.M.

This species is described from one female type and four female paratypes. The National collection contains three specimens, including the type, Hopkins No. 13687a, reared from *Disholcaspis cinerosa* Bassett on *Quercus virginiana* Miller, April 5, 1918, collected by J. D. Mitchell, at Victoria, Tex.; and one specimen reared March 15, 1911, from *Amphibolips*, species on *Quercus virginiana* Miller, collected by J. D. Mitchell at Victoria, Tex. In the author's collection is one specimen bearing Hopkins No. 13687a and other data for this number as given above.

78. CALLIMOME CALIFORNICUM, variety SUBDOLUM, new variety

Similar to Figure 41

This variety is very closely related to *Callimome californicum* Ashmead and may easily be mistaken for it; characters indicated in the key with those mentioned below will help to separate the variety.

Female.—Length 3.5 mm.; ovipositor 3.5 mm. Thorax green with a golden tint in some lights. Head viewed from the front coppery green, coarsely reticulately punctate and clothed moderately with white hairs; facial carina low but very wide and extending to margin of clypeus; antennal depression almost as deep as the diameter of the scape and cupreous within; scape testaceous, the flagellum brown, the pedicel and ring-joint darker and together as long as first funicle joint which is about one-fifth longer than wide and not more than four-fifths as long as the second joint; all joints of funicle longer than wide, of about equal width and clothed with closely set brownish hairs; ocelli maroon, eyes red; the ocellocular line about one and two-fifths times as long as the lateral ocellar line; the diameter of the median ocellus one-third longer than the lateral ocellar line and about four-fifths as wide as the ocellocular line. Thoracic dorsum deeply punctured; pronotum and anterior of mesoscutum coarsely rugose, the large thimble-like punctures not apparent; mesoscutum one-third longer than the scutellum and conspicuously rugose between the large punctures; punctures not so numerous as on the mesoscutum, the anterior one-third mostly finely reticulated, the remaining portion as far as the scutellar cross furrow reticulated between the large punctures; scutellar apex finely sculptured and occupying one-third of the scutellar area; propodeum feebly rugose, smooth, green, the anterior margin with small pits; coxae greenish-brown, the hind ones coppery; femora brown testaceous with a greenish tinge, the hind ones very slightly enlarged; tibiae dark testaceous, the tip of hind ones brown testaceous; tarsi whitish-yellow; veins brownish; marginal vein not quite three-fifths as long as the submarginal; the stigmal vein sessile but with a rather long uncus; vein radiating toward the tip of wing and upward from the stigmal vein consisting of a single row of hairs.

Abdomen about half as long as the thorax and fuscous with a cupreous tinge.

Male.—Length 2 mm. Bluish-green with no brassy reflection. Scape dark testaceous with a tinge of brownish-green; flagellum fuscous all joints of funicle longer than wide; coxae and femora dark green; tibiae fuscous with a testaceous or greenish shades.

Type locality.—Camp Baldy, Calif.

Host.—*Disholcaspis truckeensis* Ashmead on *Quercus chrysolepis* Liebmann.

Type.—Cat. No. 25343, U.S.N.M.

Described from many specimens. The type series, except for two paratypes bearing Hopkins No. 15613*b* in the author's collection, is in the National collection.

Distribution.—Twelve females (one type) and 20 males (one allotype), Hopkins No. 15613*b*, reared from *Disholcaspis truckeensis* Ashmead on *Quercus chrysolepis* Liebmann, June 24 to August 8, 1918, collected at Camp Baldy, Calif., by L. H. Weld. Other paratypes as follows: Two specimens, Hopkins No. 15613*e*, reared July 8, 1918, from *Disholcaspis chrysolepidis* Beutenmueller on *Quercus chrysolepis* Liebmann, collected at Los Gatos Calif., by L. H. Weld. One specimen, Hopkins No. 15922*h*, reared July 9, 1919, from *Disholcaspis truckeensis* Ashmead on *Quercus chrysolepis* Liebmann, collected by R. D. Hartman at Los Gatos, Calif. Two specimens reared, May 6, 1917, from *Disholcaspis corallina* (Bassett), collected at Tuolumne, Calif.

79. CALLIMOME MACULIPENNE (Cameron)

Syntomaspis maculipennis CAMERON, Biol. Centr. Amer., p. 31, 1884, Hymen, vol. 1, p. 107, No. 1.

With the exception of a few minor changes in arrangement the original description is as follows:

Female.—Length 4.5 mm; ovipositor as long as the body. Head and thorax (except the pleurae behind, where they are smooth, shining, impunctate, and of a bluish tint) strongly and closely punctured. Front excavated above the antennae in the middle; the face coppery. Antennae rather slender, the flagellum getting thicker toward the apex; the third joint longer than the fourth, the apical compressed. Scape thin, cylindrical, reaching to the lower ocellus. Annelus long, longer than broad, thicker and rounded at the apex. Scutellum behind the transverse line much finer and closer punctured than it is in front of it. Coxae rather strongly, femora obscurely punctured. The coxae are coppery; femora black, with a slight coppery tint. The posterior tibiae are black except at base and apex; the anterior are for the greater part testaceous in front, coppery behind. The tarsi are of a clear yellow except that the apices of the joints of the posterior tarsi are fuscous; the long spur of the calcaria reaches a

little beyond the middle. Wings clearly hyaline; humerous testaceous; ulna and cubitus blackish, on the latter a fuscous fascia. Abdomen smooth, shining, coppery. The posterior edge of basal segment of abdomen incised. As with most of the species the coppery tints are irregularly distributed over the body.

Type locality.—Mexico.

Host.—Reared from a gall.

This species is unrecognized by the writer. It is quite evident, however, that it is closely allied to *Callimome californicum* (Ashmead). Type probably in the British Museum of Natural History.

80. CALLIMOME CALIFORNICUM (Ashmead)

Similar to Figure 41

Syntomaspis californica ASHMEAD, Trans. Amer. Ent. Soc., vol. 13, 1886, p. 127, No. 26.

Syntomaspis californica Ashmead (?) FULLAWAY, Journ. N. Y. Ent. Soc., vol. 20, 1912, p. 274.

Female.—Length 4 mm; ovipositor 6.75 mm. Thoracic dorsum golden green and with large thimblelike punctures. Head strongly transverse and as wide as thorax; viewed from the front rather coarsely rugosely sculptured and with numerous shallow irregularly placed impressions; face with golden coppery tints in some lights and rather densely clothed with moderately long white appressed hairs; facial carina low and broad, extending to margin of mouth; scape pale testaceous, flagellum brown; pedicel and ring-joint together about two-thirds as long as first joint of funicle; first funicle joint and ring-joint combined about as long as second funicle joint; all funicle joints distinctly longer than wide and of equal width; the ocellocular line about one and one-fifth times the length of the long diameter of posterior ocellus; eyes red. Area between the large discoidal punctures of thoracic dorsum coarsely rugose; punctures on the scutellum not so numerous but larger than on the mesoscutum and the area between them reticulated; scutellar cross furrow deep, the area behind it finely reticulated rugose and occupying one-third of the entire scutellum; propodeum feebly rugose, smooth, with a row of small pits on the anterior margin; coxae green, the hind one strongly cupreous outwardly above; femora and tibiae moderately testaceous, the hind femora distinctly bulged on the lower margin beyond the middle and with several minute denticulations; tarsi yellowish, the last joint brown; veins of wings yellowish; the marginal vein a little over one-half as long as the submarginal; the vein running from the stigmal vein toward the tip and upward consisting of a single row of hairs; stigmal vein sessile. Abdomen slightly subcompressed and somewhat carinate; the first three segments medially incised; conspicuously but feebly reticulated.

Male.—Length 3.5 mm. More uniform green than the female. Thoracic dorsum rather densely clothed with silvery hairs; all femora green, the proportion of green increasing from the fore to the hind femora; the tips not green; tibiae light brown to chestnut; flagellum dense black; first joint of funicle a little more than twice as long as pedicel and ring joint combined. Abdomen green.

Type locality.—California.

Host.—*Andricus pomiformis* (Bassett) Ashmead.

Type.—Cat. No. 25316, U.S.N.M.

I have redescribed this species from the type series in the National collection, which consists of one female type, one male allotype, and one male paratype. It resembles the variety *subdolum* Huber in general sculpture and form, but may be separated by its larger body, an ovipositor at least one and one-half times as long as the body, and a distinctly golden-green color.

Distribution.—California (type). Besides the type series the following are in the National collection: Six specimens, Hopkins No. 5605a, reared May 29, 1918, from *Andricus pomiformis* Bassett on *Quercus wislizenii* De Candolle, collected by L. H. Weld at Upland, Calif. Eight specimens, Hopkins No. 5605eb, reared November 6, 1918, from *Andricus pomiformis* Bassett on *Quercus wislizenii* De Candolle, collected by L. H. Weld at Camp Baldy, Calif. Five specimens, Hopkins No. 15605e, reared July 15, 1918, from *Callirhytis rossi* Kieffer on *Quercus wislizenii* De Candolle, collected by L. H. Weld at Camp Baldy, Calif. Five specimens, Hopkins No. 19922f, reared August 7, 1919, from *Callirhytis*, species on *Quercus chrysolepis* Liebmann, collected by R. D. Hartman at Los Gatos, Calif. Seven specimens, Hopkins No. 19922h, reared June 4 to June 26, 1919, from *Disholcaspis truckeensis* Ashmead on *Quercus chrysolepis* Liebmann, collected by R. D. Hartman at Los Gatos, Calif. One specimen, Hopkins No. 13643j, reared November 14, 1916, from *Disholcaspis* species on *Quercus douglasi* Hooker and Arnott, collected by F. R. Herbert at Placerville, Calif. One specimen, Hopkins No. 15613b, reared August 1, 1918, from *Disholcaspis truckeensis* Ashmead on *Quercus chrysolepis* Liebmann, collected by L. H. Weld at Camp Baldy, Calif. Seventeen specimens No. 3833Q1 and three specimens No. 3833½ reared from twig galls on *Quercus wislizenii* De Candolle collected by A. Koebele at Marion County, Calif. Three specimens No. 549 reared October, 1889, from galls on *Quercus dumosa* Nuttall, collected by A. Koebele in Sonoma County, Calif. Eight specimens, Hopkins No. 14215, reared July 29, 1916, from *Disholcaspis maculipennis* Gillette on *Quercus garryana* Douglas, collected by J. M. Miller at Ashland, Oreg. Three specimens, Hopkins No. 12595b², reared August 9, 1915, from *Disholcaspis maculipennis* Gillette

on *Quercus garryana* Douglas, collected by J. M. Miller at Ashland, Oreg. Three specimens, Hopkins No. 12595f², reared February 26, 1915, from *Disholcaspis maculipennis* Gillette on *Quercus garryana* Douglas, collected by J. M. Miller at Ashland, Oreg. Six specimens, Hopkins No. 47a with no data. Twenty-four specimens, No. 22° Sacramento, reared August and September from Cynipid galls on *Quercus wislizenii* De Candolle at Folsom, Calif.

In author's collection are several specimens reared from galls collected by A. C. Kinsey. The dates given refer to the time the galls were collected and not to when the Chalcids emerged. One specimen reared from *Andricus pomiformis* Bassett on *Quercus wislizenii* De Candolle, Three Rivers, Calif., March 23, 1920. Three specimens reared from *Andricus pacificus* Ashmead on *Quercus chrysolepis* Liebmann, El Portal, Calif., March 26, 1920. Three specimens reared from *Disholcaspis corallina* (Bassett) on *Quercus douglasi* Hooker and Arnott, Byron, Calif., March 19, 1920. One specimen reared from *Disholcaspis plumbella* Kinsey on *Quercus dumosa* Nuttall, S. Jacinto Mountains, Calif., February 28, 1920, and one specimen of *Disholcaspis simulata* Kinsey with the same data. Four specimens reared from *Disholcaspis maculipennis* Gillette on *Quercus garryana* Douglas, Yreka, Calif., April 4, 1920, and two specimens from Ashland, Oreg., with same data. One specimen reared from *Andricus californicus-glabrescens* Kinsey on *Quercus dumosa* Nuttall, El Toro, Calif., February 14, 1920. Four specimens reared from *Andricus californicus* (Bassett) on *Quercus dumosa* Nuttall, Alpine, Calif., February 24, 1920. Two specimens reared from *Andricus californicus californicus* Kinsey on *Quercus douglasi* Hooper and Arnott, Gilroy, Calif., March 19, 1920. Two specimens reared from *Andricus californicus californicus* Kinsey on *Quercus lobata* Nees, Paso Robles, Calif., March 7, 1920. One specimen *Disholcaspis maculipennis* Gillette on *Quercus garryana* Douglas, Ashland, Oreg., April 4, 1920.

The variation in this species is quite apparent. In specimens reared from the same gall the ovipositor may be proportionately one-third longer than normal. Color varies from a golden-green to a decided coppery. And as in most species the size varies apparently according to the food supply.

81. CALLIMOME ELEGANTISSIMUM Ashmead

Figure 41

Callimome elegantissima ASHMEAD, Trans. Amer. Ent. Soc., vol. 9, 1881, Proc. p., xxxiv.

Syntomaspis elegantissima (Ashmead) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Female.—Length 4.5 mm.; ovipositor 5.25 mm. Thoracic dorsum coarsely punctured and very distinctly cupreous. Head transverse

and as wide as thorax; face mostly minutely reticulately rugose, with a few large but shallow impressions, and clothed sparsely with whitish hairs; facial carina low and very wide, extending nearly to the margin of the mouth, becoming wider toward the tip and with its sides well defined with depressed lines; face rather copperish in some lights; scape dark testaceous, flagellum blackish; pedicel robust and brownish; ring-joint and pedicel combined about three-fourths as long as the first joint of funicle which is subequal to the second, the other joints gradually decreasing in length toward the tip but all decidedly longer than wide and of equal width; the ocellular line one and one-fourth times as long as the diameter of median ocellus; the lateral ocellar line shorter than the diameter of mid ocellus and the same length as the line between the foraminal margin and the posterior ocellus. Pronotum very short, transversely rugose with moderate-sized impressions; the posterior margin bluish; anterior margin of the mesoscutum rather finely transversely rugose and greenish, the rest of the mesoscutum and the inner and dorsal margins of scapulae and axillae and the scutellum back to the cross furrow, very strongly cupreous; space between the large punctures highly rugose; scutellar cross furrow deep, the scutellar apex one-fourth as long as the entire scutellum and finely reticulately rugose, not so highly tinged as rest of scutellum; propodeum feebly longitudinally rugose, smooth, greenish-blue, and anterior margin with a row of moderate-sized pits; coxae green with a bluish-purple tint in some lights; femora and tibiae dark testaceous, the hind femora not conspicuously bulged on the lower margin beyond the middle and with no minute denticulations; tarsi pale ferruginous, the tips brown; mesopleura purplish; veins of wings yellow, marginal vein a little more than one-half as long as submarginal; stigmal vein sessile and with a vein consisting of a double row of hairs running from it upward and toward the tip. Abdomen as long as the thorax and seen from above as wide as the thorax; green with a purplish tinge; first four segments medially incised.

Male.—Length 2.25 mm. Body mostly green, the thoracic dorsum with a rusty tinge. Scape brown testaceous, flagellum blackish; femora dark green, tibiae dark testaceous, the hind ones growing blackish toward the tip.

Type locality.—Jacksonville, Fla.

Host.—*Cynips q-ficus* Fitch.

Type.—Cat. No. 25315, U.S.N.M.

The National collection contains one well-preserved type specimen from which I have redescribed the female. The male is described for the first time from a specimen bearing the following data: Hopkins No.15633c reared November 23, 1920, from *Disholcaspis ficigera*

Ashmead on *Quercus geminata* Small, collected by L. H. Weld, Carabelle, Fla. A female with the same data is in the author's collection.

This species is most closely related to *Callimome californicum* (Ashmead) but can be easily separated from it by the characters given in the key.

82. CALLIMOME PRUNICOLA, new species

Figure 17

Female.—Length 2.25 mm.; ovipositor 0.5 mm. Purplish-crimson; head wider than thorax and with coarse but shallow punctures; sparsely clothed with white hairs; facial carina extending half the distance to margin of mouth; scape yellow, pedicel brown with a purplish shade, flagellum brown; ring-joint one and one-half times as wide as long, the pedicel as long as first joint of funicle which is longer than wide; the succeeding joints of funicle as wide to wider than long toward the tip; eyes brunneous. Thorax robust, dorsum a brilliant crimson purple, the sculpture coarsely rugose; sides of pronotum prominent; mesoscutum as long as the width of front margin; parapsidal furrows deep, the scapulae bulged; scutellum as long as the mesoscutum, the scutellar cross furrow distinct and back of the apical one-third; scutellar apex minutely striate and greenish in some lights; propodeum shining but with carinae in the middle; coxae and femora crimson purplish, tibiae lighter but with a decided crimson tinge; tarsi whitish yellow, stigmal vein sessile. Abdomen ovate, robust; segments not incised; sides with long silvery hairs especially on the posterior segments; ovipositor one-third as long as abdomen and very erect.

Male.—Unknown.

Type locality.—Sante Fe, New Mexico.

Host.—"On cherry."

Type.—Cat. No. 25328, U.S.N.M.

This species is described from one female collected by T. D. A. Cockerell and is recorded under Cockerell No. 1102, and bears a note that it was taken on cherry.

83. CALLIMOME HOLCASPOIDEA (Ashmead)

Figure 5

Syntomaspis holcaspoidea ASHMEAD, Mem. Car. Mus., vol. 1, 1904, p. 397.

Redescribed from two females in the National collection and labeled as *holcaspoidea*.

Female.—Length 2 mm.; ovipositor as long as abdomen. Blue with a tinge of crimson. Face rather coarsely rugulose, bulging below the antennal depression, tinged with green and clothed with short white hairs; facial carina very poorly developed, extending scarcely outside of scrobes; scrobes deep and bright green; vertex coarsely sculptured; scape yellow, pedicel light brown, the remainder of antennae slightly darker and distinctly clubbed; eyes pinkish, the

ocelli transparent. Thorax coarsely rugose-punctate and with a violaceous tinge in some lights; pronotum not so coarsely sculptured as the mesoscutum and margined posteriorly with a shining band; cross furrow on the scutellum deeply impressed; scutellar apex finely reticulate and with a bluish metallic color; pleura violaceous; coxae violaceous blue, trochanters light brown, femora light brown on the inside and crimson-brown on the outside; tibiae yellowish, tarsi mostly whitish-yellow; stigmal vein sessile. Abdomen a little shorter than the thorax, violaceous blue, segments emarginate dorsally.

Male.—Length 1.2 to 1.5 mm. Agrees well with the female in color and sculpture, except that the scape of the antennae alone is yellowish, the pedicel being aeneous-black. The abdomen is small, oval. Ashmead.

Type locality.—Chapada and Corumba, Brazil.

Host.—Unknown.

Types.—Two males and two females in Carnegie Museum.

The females from which the above redescription is drawn were taken in Benito Province, Pernambuco, Brazil, February, 1883. Although I have not had opportunity to study the types I believe that the specimens in the National collection are identical with them.

84. *CALLIMOME SOLIDAGINIS*, new species

Figure 6

Resembles *Callimome holcaspoidea* (Ashmead) but may be separated by the characters indicated in the key.

Female.—Length 2 mm; ovipositor 1.5 mm. Bluish purple with tinge of violet. Head transverse; viewed from the front slightly wider than long; face minutely sculptured, with a few short but stout white hairs, slightly convex and with a brownish-green tinge; vertex strongly convex; ocelli amber, the eyes reddish; width between the posterior ocellus and the eye margin about one and one-half times the diameter of an ocellus; scape yellow, pedicel very fuscous, the rest of the flagellum not so dark; flagellum distinctly clubbed and longer than the width of the head. Thoracic dorsum with large umbilicate punctures which become more shallow towards the posterior, the scutellum with very few punctures but with a very fine reticulated sculpture; scutellar cross furrow well defined, the scutellar apex entirely reticulated; parapsidal grooves and other thoracic grooves strongly impressed and with greenish margins; coxae, trochanters and femora brown with violaceous tinges, especially on the hind femora, which in certain lights appears violaceous; tibiae distinctly ciliate, the stigmal vein sessile. Abdomen brown, slightly violaceous in certain lights; segments medially emarginate; ovipositor brown.

Male.—Length 1.6 mm. Scape purplish-green, pleura purplish, femora brownish-purple except tips of mid and fore tibiae. Abdomen shorter than thorax and brownish purple.

Type locality.—Ithaca, N. Y.

Host.—*Cecidomyia*, species.

Type.—Cat. No. 25325, U.S.N.M.

Described from two females and one male reared February 28, 1898. The female type and male allotype are in the National collection; one female paratype is in the author's collection.

85. CALLIMOME OSBORNI, new species

Figure 4

Female.—Length 2.75 mm.; ovipositor 3.75 mm. Thorax bluish-green and deeply punctured; abdomen mostly yellow. Head very much wider than the thorax and not strongly transverse; blue-green except the margin of the mouth which is brown; facial carina scarcely noticeable; scape attached to middle of the head, light yellow, rather robust and slightly curved; pedicel a little darker than the scape and somewhat brownish; rest of flagellum brown; pedicel and ring-joint combined equal to the first joint of funicle which is five-eighths as wide as the last joint of funicle; eyes and ocelli brunneus, the latter almost in a straight line; the posterior ocelli about one and one-half times their diameter from the eye margin. Pronotum almost entirely transversely rugose, the mesoscutum with deep thimble-like punctures but with a very coarse rugosity between the pits; parapsidal grooves very distinct and not parallel at any point; scutellum not so deeply sculptured, minutely reticulated anteriorly; scutellar cross furrow distinct, the apex feebly sculptured and vertically rugose; propodeum with a median carina, the anterior margin deeply pitted; pleura purplish; coxae brown with a blue green tinge, the tips yellowish; femora, except the hind ones which are brown on the basal half, yellow; tibiae yellow-ferruginous; wings moderately ciliate, veins brown, the stigmal vein sessile. Abdomen a little longer than the thorax; brownish ventrally, yellow laterally and dorsally, except a brown area beginning one-third the distance from the anterior and extending back to the ovipositor and about one-third the width of abdomen; ovipositor three times as long as abdomen.

Male.—Joints of funicle all distinctly longer than wide and of equal width; hind tibiae brown, the others yellow-ferruginous with tints of brown. Abdomen without yellow color but greenish-blue.

Type locality.—Point of Rocks, Wyo.

Host.—Cynipid gall on *Rosa*, species.

Type.—Cat. No. 25323, U.S.N.M.

Describe from one female and two males reared May, 1882, by L. Bruner and recorded under No. 1010c. The female type and male allotype are in the National collection. One paratype is in the author's collection. I have named this species in honor of Prof. Herbert Osborn.

86. CALLIMOME UMBILICATUM (Gahan)

Figure 3

Syntomaspis umblicata GAHAN, Ann. Ent. Soc. Amer., vol. 12, 1919, pp. 163-4.

With the exception of a few minor changes the original description is as follows:

Female.—Length 2.5 mm.; ovipositor about as long as body. Head viewed from front above as long as broad; face strongly sculptured with large shallow punctures; antennal depressions deep and nearly smooth within, the antennae separated at the base by a carinate ridge; post ocellar line equal to twice the ocellocular line, the lateral ocelli not farther from the eye margin than the diameter of an ocellus; antennal pedicel conical, about equal in length to the first funicle joint; ring-joint a little more than twice as broad as long; first funicle joint nearly quadrate, following joints diminishing very gradually in length, the last about two-thirds as long as broad; club three-jointed, not broader than the funicle and about as long as the three preceding funicle joints; pronotum rugulose; mesoscutum with large, closely placed umbilicate punctures surface of the scutellum before the distinct cross-furrow sculptured like the mesoscutum, behind the cross-furrow finely reticulately sculptured; propodeum polished, with carinae and with a row of large punctures along the anterior margin; ciliation of the forewing similar to that described for *Callimome (Syntomaspis) medicaginis* (Gahan), but not so distinctly arranged in rows, the row running from the stigmal vein to apex of wings present, but very poorly defined and the wedge shaped hairless area behind the marginal vein somewhat more restricted, there being three or four coarse cilia basad of the stigmal vein in the apex of the wedge; marginal vein four-fifths as long as submarginal; hind coxae about twice as long as thick with the dorso posterior angle weakly carinately margined; abdomen about as long as the thorax; first, second, and third tergites emarginate medially, dorsally mostly polished; the second and third at sides, and the fourth entirely, distinctly reticulate; color of head and thorax above dull coppery green; propodeum polished metallic green; pleurae, coxae and all femora metallic greenish-black or bluish in some lights; first three tergites above steel-blue sides of the abdomen and dorsum beyond the third tergite brassy green; antennal pedicel and flagellum brownish-black, more or less metallic; scape, all tibiae, and tarsi reddish testaceous; ovipositor sheaths black; wings hyaline; venation pale yellowish.

Male.—Length 2 mm. Antennal pedicel a little shorter than the first funicle joint; first funicle joint slightly broader than long and not longer than the second; joints beyond the second very slightly diminishing in length; propodeum faintly rugulose with a very weak

median carina; abdomen a little shorter than thorax; scape dark above, reddish testaceous beneath; all tibiae brownish-black; tarsi pale yellowish.

Type locality.—Tempe, Ariz.

Host.—Gall of a Cecidomyid on *Suaeda*, species.

Type.—Cat. No. 22298, U.S.N.M.

The type series in the National collection consist of a female type, a male allotype, and two male paratypes reared by V. L. Wildermuth and recorded under Tempe No. 2741.

Distribution.—Tempe, Ariz. (Type). There are also in the National collection 11 specimens No. 229^o reared June, 1887, from Cecidomyid galls on *Atriplex canescens* (Pursh) Watson, collected by A. Koebele at Los Angeles County, Calif.; two specimens of this same series are in the author's collection.

87. CALLIMOME RUGOSIPUNCTATUS (Ashmead)

Figure 25

Torymus rugosipunctatus ASHMEAD, Journ. Linn. Soc. Lond. Zool., vol. 25, 1894, p. 193.

Female.—Length 2 mm.; ovipositor 2 mm. Slightly brassy green with deep umbilicate punctures. Head transverse and rather deeply punctured; viewed from the front almost as long as wide, distinctly wider than the thorax, and with a brassy tinge in some lights; a row of coppery pits on the eye margins, and very sparsely clothed with hairs; facial carina extending three-fifths the distance to margin of mouth, which is brownish; antennae inserted in middle of head, the antennal depression prominent and smooth within; scape yellowish, pedicel dark testaceous, the rest of flagellum brown and distinctly clubbed; pedicel and ring-joint much longer than the first joint of funicle the ring-joint as wide as long; the funicle and club densely pubescent; ocelli and eyes red. Thoracic dorsum deeply and irregularly sculptured with large thimble-like pits, the scutellar apex not punctured but with microscopic striae and hence shining; metanotum as long as propodeum; propodeum with a carina; coxae greenish-brown, femora fuscous, the tips a little lighted; tibiae reddish testaceous, the tarsi testaceous except the last joint which is brown; veins of wings yellow; marginal and submarginal veins equal in length, the stigmal vein sessile. Abdomen dark green, shorter than the thorax, strongly subcompressed, and carinate above.

Male.—Length 1.75 mm. Scape testaceous; femora light brown with a greenish tinge, hind tibiae infuscated the other tibiae testaceous.

Type locality.—St. Vincent, West Indies.

Host.—Unknown.

Type.—Cat. No. 2434, U.S.N.M.

This species was described by Ashmead from 8 males and 12 females; of that series one female type and one male allotype are in the National collection. I have redescribed the species from these specimens. In addition to the above data they are labeled H. H. Smith, 207.

88. *CALLIMOME TRICOLOR*, new species

Figure 27

Resembles *Callimome advena* Osten Sacken in general size and structure but may be separated from it by the characters indicated in the key.

Female.—Length 2.5 mm.; ovipositor 2.5 mm. Head and thorax greenish-blue, the abdomen purplish to crimson. Head distinctly broader than thorax; face strongly punctured with large shallow impressions and sparsely clothed with short white hairs; scrobes deep and blue within; facial carina prominent; post ocellar line equal to twice the ocell-ocular line, the posterior ocelli a little more than their diameter from the eye margin; eyes red. Prothorax rugulose, the rest of thoracic dorsum deeply punctured with large thimble-like punctures, except behind the well-marked scutellar cross furrow; the scutellar apex finely reticulately rugose and with a shining golden green reflection; metanotum with a median carina, the propodeum polished and also with a median carina and several large pits on the anterior margin; coxae blue-green, purplish in some lights, the hind ones somewhat crimson, the upper margin sharply carinate, the lower side longitudinally rugose and bright green; femora all dark, the first pair rather brown, the second and third dark brown with a bluish-green tinge, except the extreme tips which are castaneous; all tibiae reddish testaceous, the last joint of tarsi brown; wings moderately ciliate; the submarginal vein one and one-seventh times as long as the marginal, the stigmal vein sessile. Abdomen bluish crimson with green tint in some lights; distinctly longer than the thorax, somewhat subcompressed, the first four segments incised slightly medially.

Male.—Length 2 mm. Scape flavo-testaceous; hind femora dark blue-green, the other femora and hind tibiae deeply infuscated, the mid and fore tibiae brownish-yellow. Abdomen with a violaceous tinge.

Type locality.—Brownsville, Tex.

Host.—*Asphondylia*, species.

Type.—Cat. No. 25326, U.S.N.M.

Described from 10 females and 7 males reared July 3 to 11, 1912, and recorded under Webster No. 6467, Experiment 1. The female type, male allotype, and 13 paratypes are in the National collection. Two paratypes are in the author's collection.

89. CALLIMOME AZTECUM (Cameron)

Torymus aztecus CAMERON, Invert. Pacif. vol. 1, 1904, p. 59.

The original description is as follows:

Female.—Length 2 mm.; ovipositor as long as the body. Head and upper part of thorax with thimblelike punctures, the thorax more strongly than the head. Greenish-blue, the abdomen for the most part blue and violaceous, the coxae and femora blue, tinged with green, the tibiae black, the tarsi white; antennae black, the scape testaceous. Pleurae smooth, largely violaceous; wings hyaline, the nervures black. Eyes brown. Abdominal segments narrowly banded with black. Tegulae fuscous.

Type locality.—Mexico.

Host.—Unknown.

This species is unrecognized by the writer. Its nearest known relative is *Callimome tricolor* Huber, from which it is easily separated by the color of the tibiae.

It is not known where the type is deposited.

90. CALLIMOME ADVENUM Osten Sacken

Figure 30

Callimome advena OSTEN SACKEN, Trans. Amer. Ent. Soc., vol 3, 1870, pp. 59-60, No. 3.

Female.—Length 3 mm.; ovipositor 2.25 mm. Green with strong bluish tinge; thoracic dorsum coarsely punctured; head transverse, deeply punctured, the punctures more shallow below the antennae; viewed from front five-sixths as long as wide; facial carina prominent, extending about one-half the distance to the mouth; antennal groove not deep but smooth and finely reticulated within; scape slender, yellow, flagellum light brown, pedicel and ring-joint shining; the pedicel a little longer than first joint of funicle, the last four joints of funicle wider than long, the preceding a very little longer than wide; eyes red and bulging, ocelli pinkish. Thorax elongate, the dorsum clothed with short bristly hairs; pronotum mostly rugose and without many punctures and the posterior margin with a shining purplish band; mesoscutum as long as the scutellum and nearly as wide as long anteriorly; scapulae prominent, the axillae reduced; scutellar cross furrow well defined, the scutellar apex rugose and somewhat shining; propodeum feebly sculptured, shining, but with a prominent median carina and well-developed lateral folds; scutellum as coarsely sculptured as the mesoscutum, the area between the punctures rugose and shining; fore and mid coxae brownish with purplish-blue reflections, brown outside; hind coxae purplish, first two pairs of femora brown except the tips which are yellowish, the hind femora purplish brown except the tips which are light brown; fore

and mid tibiae testaceous, the hind one brown or infuscated, except the tips which are slightly testaceous; tarsi whitish, the last joint brown; marginal vein five-sixths as long as submarginal, stigmal vein sessile; veins yellow. Abdomen green with a bluish tint; longer than the thorax; first and second segments medially incised, the third with only a slight incision.

Type locality.—Washington, D. C.

Host.—*Diastrophus nebulosus* Osten Sacken.

Paratype.—Cat. No. 25392, U.S.N.M.

This species is redescribed from two female paratypes recently received by the National collection from the Cambridge Museum of Natural History, Zoology, and bearing the data "Type No. 812, reared from *Diastrophus nebulosus* Osten Sacken."

The male is described from a series of ten specimens bearing No. 3762x.

Male.—Length 1.75 mm. Green but strongly fuscous. Funicle joints all wider than long except the first; coxae brownish, the hind ones with a purplish tinge; femora and tibiae fuscous.

Distribution.—Washington, D. C. (Type). In addition to the paratype received from the Cambridge Museum of Comparative Zoology, the National collection contains 15 specimens, No. 3762x, reared from galls of a species of *Cecidomyia*, in the blossoms of *Vernonia noveboracensis* Willdenow, collected by Mr. Pergande at Chain Bridge, Va. One specimen reared from *Oedaspes atra* Loew on *Solidago*, collected by J. C. Bridwell at Glen Echo, Md. Two specimens, Hopkins No. 7223, reared September 16, 1907, from a gall on *Solidago*, collected by E. J. Kraus at Seven Lock, Md.

Callimome advena Osten Sacken resembles *Callimome tricolor* Huber, from which it is easily separated by color.

Except the type, which is reported from *Diastrophus nebulosus* Osten Sacken, all other rearings reported have been from Cecidomyid galls. Moreover, Osten Sacken in the reference cited above, mentions five specimens reared from *Asphondylia rudbeckiae conspicua* Osten Sacken by Jacob Stauffer, Lancaster, Pa., which he evidently thought to be the same species he described. From all of the extensive rearings from *Diastrophus nebulosus* Osten Sacken in later years no specimens of *Callimome advena* Osten Sacken have been found. It seems, therefore, that in view of this fact and also that the hosts are quite different, that too much emphasis can not be placed on Osten' Sacken's record.

One female of this species was reared, June 21, 1915, from the seeds of *Amelanchier canadensis* (Linnaeus) Medicus, collected at North East, Pa., by R. A. Cushman. *Callimome amelancheris* (Cushman) was reared from the same lot of seeds. It is not known whether the species is phytophagous or parasitic.

91. CALLIMOME SMITHI (Ashmead)

Figure 24

Torymus smithi ASHMEAD, Mem. Car. Mus., vol. 1, No 4, 1904, p. 398.

The original description follows:

Female.—Length 3 mm.; ovipositor longer than the body. Blue, the head and thorax with a thimblelike punctuation, the tips of the scutellum smooth and metallic green; the scape, tegulae, veins, and most of the legs, except the coxae and the femora, are yellowish, the coxae and the hind femora are blue, the front and middle femora above and basally are brownish.

Type locality.—Chapada and Para, Brazil.

Host.—Unknown.

Type.—Cat. No. 8056, U.S.N.M.

Described from two females but represented in the National collection by a single specimen. The head of this specimen is missing and several parts of the body are not in position for study. I have noted, however, that the thoracic dorsum is mostly blue with greenish tints; the abdomen is violaceous as in *Callimome tricolor* Huber; the fore and mid femora are greenish-brown with a slight purplish tint, and the hind femora more distinctly violaceous; tibiae testaceous, the hind ones infuscate at the extreme tip; the ovipositor not quite as long as the body.

92. CALLIMOME NEUROTERUM (Ashmead)

Figure 9

Torymus neuroterus ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 188, No. 27.

This species, although first described from several specimens, is now represented in the National collection by a single specimen, the abdomen of which is entirely missing and the remainder so covered with glue that it has been difficult to examine it. For this reason I am including Ashmead's short description, which is as follows:

Male.—Length 1.25 mm. A diminutive, metallic green little species with a large transverse head, black antennae, blue or violet colored metathorax and abdomen and metallic green legs, the trochanters, tips of tibiae, and tarsi alone being white. The abdomen is pedunculate.

Additional notes: Head with reddish tints in some lights; viewed from front strongly depressed, and clothed with few white, feeble hairs; scape dark greenish-brown, the base lighter; flagellum brown, the joints of funicle not longer than wide; postocellar line about one and one-half times the diameter of posterior ocellus. Thoracic dorsum minutely and not deeply reticulated; somewhat shining and with cupreous tints in some lights; parapsidal furrows not depressed, scarcely visible except toward the posterior; scutellum with reticulations more or less longitudinal, the anterior portion slightly elevated; scutellar apex highly polished; propodeum smooth, shining, purplish,

the anterior margin with very minute pits; thorax ventrally and the coxae a rather delicate purplish, the femora and tibiae a light greenish-brown; veins of wings pale yellow, the stigmal vein sessile. Abdomen missing.

Type locality.—Jacksonville, Fla.

Host.—*Neuroterus minutissimus* Ashmead.

Type.—Cat. No. 2886, U.S.N.M.

UNRECOGNIZED SPECIES

Unfortunately, I have been unable to recognize 11 of the species which have been placed in this genus. *Callimome lissus*, *theon*, *aea*, *splendidulus*, and *cecidomyiae* were first described by Walker. All of them were taken in America. I have not examined any of the types; it is probable that they are all deposited in the British Museum. Walker's descriptions omit many specific characters and until the types are examined it will not be safe to place the species definitely. Two species *ochreatum* and *parvidum* were described by Say. There is no doubt that *ochreatum* is very closely related to *advenum* but I have done nothing with it for the present. The types have been destroyed by fire. *Callimome thompsoni* (Fyles), apparently a phytophagous species, and *Callimome longicaudum* Provancher were both reported from Canada, while *pallidipes* (Ashmead) was taken in the West Indies; *abortum* (Crosby) is from Kansas.

93. CALLIMOME CECIDOMYIAE Walker

Callimome cecidomyiae WALKER, Ann. Mag. Nat. Hist., vol. 14, 1884, p. 15.

Torymus cecidomyiae (Walker) DALLA TORRE, Cat. Hymen., 1898, vol. 5, p. 302.

This species is unrecognized by the writer; the original description follows; words in italics are my own.

Female.—Aureo-viridis, antennis nigris, pedibus flavis viridi et fusco vittatis alis limpidis. Corp. long. lin 1.25 (2.5 mm.); alar lin. 2 (4 mm.).

Body bright golden-green, convex; head and thorax finely squamous, the scales on the head and on the fore part of the thorax so disposed as to form little transverse undulations; head as broad as the thorax; antennae black and subclavate, pubescent, shorter than the thorax; first joint (*scape*) long, slender, green, fulvous at the base; second (*pedicel*) cyathiform; third and fourth (*evidently mistaken for the single ring joint*) very minute; fifth and following joints to the eleventh (*tenth*) successively but very slightly shorter and broader; club linear, conical at the tip, a little broader than the eleventh joint and more than twice its length; thorax elliptical; prothorax transverse, narrower in front, its breadth more than twice its length; scutum of the mesothorax long; sutures of the parapsides distinct, approaching each other; axillae large, triangular, not conniving; scutellum somewhat rhomboidal, metathorax transverse, very short; propodeum transverse, rather short, very slightly decumbent; podoon (*petiole*) extremely short; abdomen fusiform, smooth, shining, narrower, but not larger than the thorax, blue towards the base; the segments, except the metapodeon) *first abdominal segment*) very minutely squamous; metapodeon occupying less than one-third of the dorsum, slightly dehiscent on the middle of the hind border; octoon

and eunator of moderate length; deca-ton longer than the eunaton; protelum shorter than the eunaton; paratelum still shorter; telum very short; sheaths of the oviduct black, pubescent, much longer than the abdomen; legs yellow; coxae green; a longitudinal stripe of green on each of the metafemora, and the same fuscous on each metatibia; mesotarsi and metatarsi straw color, fuscous at the tips; wings limpid, broad, very long, reaching when at rest to half the length of the sheaths of the oviduct; nervures piceous; humerus much less than half the length of the wing; ulna much shorter than the humerus; radius hardly longer than one-sixth of the ulna; cubitus half the length of the radius; stigmal small, emitting a very short branch.

Type locality.—Canada; Martin Falls, Albany River, Hudson Bay.

Host.—" *Cecidomyia communis* Branston's MSS."

Type.—Probably in British Museum.

91. CALLIMOME SPLENDIDULUS (Dalla Torre)

Callimome splendidus (Barnstorf) WALKER, Ann. Mag. Nat. Hist., vol. 14, 1844, p. 14 (not Förster nor Perty).

Torymus splendidulus DALLA TORRE, Cat. Hymen., vol. 5, 1898, p. 313.

Due to the inaccessibility of the above publication to many students I am including the original description of this species. The words in italics are my own and are added for the sake of clearness.

Females.—Viridis cupreo varius, abdomine purpureo, antennis nigris, pedibus rufis, alis subfulvis. (Corp. long. lin. 2; Alar. lin. 3.)

Body convex, thinly clothed with hairs; head and thorax minutely squameous; the scales on the head and on the fore part of the thorax so disposed as to form little transverse undulations; head green, aeneous in front, as broad as the thorax; eyes and ocelli red; mandibles fulvous; antennae black and clavate, pubescent, shorter than the thorax; first joint fulvous, long, slender; second (*pedicel*) long-cyathiform; third and fourth very minute; (*it is my opinion that what appeared to Walker to be two joints was in reality one joint, viz, the ring-joint*); fifth and following joints to the eleventh successively shorter and broader; club linear, conical at the tip, more than twice the length of the eleventh joint (= *tenth joint*); thorax elliptical, green; prothorax transverse, forming in front a slender neck which joins the head, its breadth more than twice its length; scutum of the mesothorax long; sutures of the parapsides distinct, approaching each other; axillae large, triangular, not conniving; scutellum nearly rhomboidal; metathorax cupreous, transverse, very short; propodeum cupreous; large, subquadrate, almost horizontal, having a few little ridges (*carinae*) along the middle; podoon (*petiole*) extremely short; abdomen elliptical, purple, very minutely squameous (*reticulated*), varied with green on each side, nearly as long and as broad as the thorax; metapodoon (*first abdominal segment*) occupying more than one-third of the dorsum, slightly dehiscent (*incised*) on the middle of the hind border, having a little channel at the base; octoon a little shorter than the metapodoon; eunaton much shorter than the octoon; deca-ton still shorter; protelum, paratelum and telum very short; segments of the thorax partly cupreous, very minutely squameous, having a suture along the middle; ventral segments of the abdomen concealed by those of the dorsum; legs pale red; sheaths of the oviduct black, pubescent, a little longer than the abdomen; coxae green, scaly; wings slightly tinged with yellow; nervures fulvous; humerus much less than half the length of the wings; ulna much shorter than the humerus; radius much shorter than one-fourth the length of the ulna; cubitus not half the length

of the radius; stigma of moderate size, emitting a thick branch toward the tip of radius.

Type locality.—America.

Host.—Unknown.

Type.—Probably in British Museum.

95. *CALLIMOME LISSUS* Walker

Callimome lissus WALKER, Ann. Ent. Soc. Fr., vol. 1, p. 150, 1843.

Syntomaspis lissus (Walker) ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Type locality.—United States.

Type.—Probably in British Museum.

It should be noted that Dalla Torre in his Catalogus Hymenopterorum (vol. 5, 1898) has made what is evidently a typographical error. He has listed *Callimome lissus* Walker and *Callimome cissus* Walker, giving the same reference for each. The reference cited makes no mention of the latter name.

96. *CALLIMOME THEON* Walker

Callimome theon WALKER, Ann. Ent. Soc. Fr., vol. 1, p. 150, 1843.

Syntomaspis theon (Walker), ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Type locality.—United States.

Type.—Probably in British Museum.

97. *CALLIMOME AEA* Walker

Callimome aea WALKER, Ann. Mag. Nat. Hist., vol. 12, 1843, p. 104.

Torymus aea (Walker) DALLA TORRE, Cat. Hymen., 1898, vol. 5, p. 297.

Type locality.—New York.

Type.—Probably in British Museum.

98. *CALLIMOME ABORTUM* (Crosby)

Megastigmus? flavipes ASHMEAD, Kans. Agr. Exp. Sta. Bull. 3, 1888, p. 3, not *Megastigmus flavipes* ASHMEAD, Trans. Amer. Ent. Soc., vol. 13, 1886, p. 128, not *Callimome flavipes* WALKER, Ent. Mag., vol. 1, 1883, p. 124.

Torymus abortus CROSBY, Ent. News, vol. 25, 1914, p. 27.

Type locality.—Kansas.

Host.—Cecidomyid on cedar.

Type.—Cat. No. 27290 U.S.N.M.¹²

99. *CALLIMOME LONGICAUDUM* Provancher

Callimome longicauda PROVANCHER, Nat. Can., vol. 14, 1883, p. 34, No. 2.

Translation of the original description follows:

Female.—Length 3 mm. Brilliant metallic green; the face golden. Antennae black. Wings hyaline. The tibiae and tarsi pale yellow, the coxae and femora

¹² The type of this species was received by the United States National Museum from the Kansas Agricultural College after Mr. Huber's visit to the Museum. S. A. Rohwer.

the color of the body. First abdominal segment entirely covering the second. Ovipositor black, twice the length of the body.

Captured at Toronto on *Quercus alba* Linné. It is separated especially from *fagopyrum* by the length of its ovipositor and the color of its coxae and femora.

Type locality.—Toronto, Canada.

Host.—Unknown.

100. CALLIMOME PALLIDIPIES (Ashmead)

Torymus pallidipes ASHMEAD, Jour. Linn. Soc. Lond. Zool., vol. 25, 1894, p. 153.

The original description follows:

Female.—Length 2 mm. Slender; head and thorax metallic green, shagreened; abdomen blue-green, smooth; scape and legs, except hind coxae, pale yellowish; flagellum dark brown, the first joint the longest, the following a little longer than thick. Collar triangular; mesonotum longer than wide, with distinct furrows; scutellum about twice as long as wide, the axillae large, projecting slightly forward into the parapsidal field; metathorax smooth, the spiracles rather large, oval. Wings hyaline, the tegulae and venation yellowish, the marginal vein nearly as long as the submarginal, the stigmal vein very minute.

Type locality.—St. Vincent.

Host.—Unknown.

Type.—Probably in British Museum.

This species was described from two specimens, neither of which is in the National collection.

101. CALLIMOME THOMPSONI (Fyles)

Torymus thompsoni FYLES, Can. Ent., vol. 36, 1904, p. 106.

Type locality.—Quebec, Canada.

Host.—Plum.

Types were sent to the United States National Museum according to the above reference. It seems, however, that they either have been misplaced or lost, for they can not be found.

Mr. Fyles reports having observed this species ovipositing in plums. "As many as 30 of the insects" were found on one plum. "Some of plums attacked showed signs of previous attack of the Curculio, but most of them did not. Whether the larvae of the species feed on the flesh and juices of the plum or attack the grubs of the Curculio" was not determined.

102. CALLIMOME PAVIDUM (Say)

Torymus pavidus SAY, Writ. of Say, Le Conte, vol. 2, p. 723.

I have not recognized this species, the type of which has been destroyed. The original description follows:

Cupreous green; no large punctures; tibiae and tarsi yellowish. Inhabits Indiana.

Body coppery greenish, with the appearance of minute granules or scales; antennae black; hypostoma with the carinate line very distinct; mandib

piceous; wings hyaline; nervure pale brownish; abdomen bluish-green; feet honey yellow; thighs bluish-green; posterior pair of tarsi whitish. The surface has no large and obvious punctures which distinguish it from *Callimome (Torymus) ochreatum* Say. Length of male nearly one-tenth of an inch.

Host.—Unknown.

103. CALLIMOME OCHREATUM (Say)

Torymus ochreatus SAY, Writ. of Say, LeConte, vol. 2, p. 723.

This species has not been recognized; the type unfortunately has been destroyed by fire. The original description is included here in the hope that it will facilitate identification by others.

Green, tinged with blue; base of the antennae, tibiae and tarsi whitish. Inhabits Indiana.

Body bright green, more or less tinged on the pleurae, abdomen and thighs with blue or purplish; reticulately punctured; antennae black; first joint before dull whitish; mandibles and palpi piceous; scutel, on the posterior half with very small punctures; wings hyaline; nervure brown; abdomen polished, impunctured; terminal joint of female brassy; oviduct as long as the body, fuscous; tibiae and tarsi whitish.

Length one-tenth of an inch.

The minute puncturation of the posterior half of the scutel strongly contrasts with the large discoidal punctures of the basal half. The male has generally more of the purple tinge.

Host.—Receptacle of a *Liatris*.

Although this species is closely related to *Callimome advena* Osten-Sacken it is not identical.

SPECIES WRONGLY CLASSIFIED AS CALLIMOME (SYNTOMASPIS OR TORYMUS)

Subfamily CALLIMOMINAE

ALLOTORYMUS, new genus

Genotype.—*Syntomaspis splendens* Provancher as determined by myself and as treated below.

This genus belongs to the Callimomidae and is closely related to *Ecdamus* Walker, from which it is separated as follows: The prothorax is nearly quadrate and not conical; it is, however, very well developed. The petiole is not as long as the metathorax, but only as long as the metanotum; and there is a distinct cross furrow on the scutellum. In addition the wings are not clearly hyaline.

Generic characters.—Head transverse and with a foraminal margin; eyes bare and ocelli unusually small; antennae 13 jointed, with one ring-joint. Prothorax extremely well developed, being almost as long as wide and as seen from above nearly quadrate; mesepimeron deeply notched; propodeum long and broad; scutellum with a conspicuous cross furrow; hind femora smooth; stigmal vein rather elongate; abdomen with a petiole a little longer than the metanotum.

ALLOTORYMUS SPLENDENS (Provancher)

Syntomaspis splendens PROVANCHER, Addit. Faun. Can. Hymen., 1887, p. 196.

Female.—Length 4 mm.; ovipositor 3.5 mm. Brilliant cupreous with a bronzy or fuscous tint. Head and thoracic dorsum very finely punctured and polished, and with numerous shallow umbilications irregularly placed; head distinctly wider than the thorax, the face clothed sparsely with feeble hairs; scrobes very shallow and not more finely sculptured than face; ocelli amber and very small, forming nearly a thirty-degree angle at the median ocellus; posterior ocelli dividing the vertex into three equal parts; eyes brunneous; antennae as long as the thorax, scape yellowish and longer than the pedicel, ring-joint and first funicle joint combined; base of scape somewhat rounded to form a semi-knob; pedicel ferruginous, a little darker than the scape and shorter than the first joint of funicle; flagellum black; base of first joint of funicle three-fourths as wide as the opposite end, and two-fifths as wide as the first joint of the club. Thorax elongate, being more than twice as long as wide at the tegulae; pronotum nearly square, being a little produced anteriorly; parapsidal grooves nearly straight; apical one-third of scutellum more highly polished than the anterior portion; propodeum long, deeply sculptured with an inverted Y-shaped carina, the anterior margin deeply pitted; fore coxae ferruginous, coppery at the base; mid coxae and hind coxae green with a coppery reflection, the latter more deeply sculptured than any other part of the body; femora and tibiae castaneous; tarsi ferruginous; the hind tibiae straight; abdomen very strongly carinate, five-sixths as deep as long and not quite one-half as wide as deep; petiole a little longer than the metanotum; first segment of abdomen green; abdomen tinged with purple in some lights and as long as thorax.

Male.—Length 3.2 mm. Antennae not so distinctly clubbed as in female; scape yellowish and more curved, the knoblike process at base more conspicuous. Abdomen depressed and shorter than the thorax.

Redescribed from five specimens in the United State National Museum.

Type locality.—Canada.

Host.—Unknown.

The type of this species was deposited in the Harrington collection, but is now in the Museum at the Department of Agriculture, Ottawa, Ontario, Canada. I have not had opportunity to examine the type personally, but through the kindness of J. McDunnough, from the above-named institution much valuable information has been obtained. The type consists of one female, the abdomen of which is missing. The female from which my description was drawn was

compared with the type by McDunnough, who at the same time answered a series of queries concerning the type. I am firmly convinced that the specimens I have described are identical with the type.

Distribution.—Canada (type). One male and three females from Greeley, Colo., and one male from Vancouver Island, Canada, are in the National collection.

Subfamily MONODONTOMERINAE

PLATYKULA, new genus

Genotype.—*Syntomaspis albihirta* Ashmead.

When this species was described it was noted by Ashmead that it was "very distinct from any other" in the genus. Indeed, it belongs to a different subfamily, as is indicated above. Inasmuch as it has not been possible to place it in any of the existing genera, it has become necessary to erect a new genus. I have proposed the name *Platykula*.

Generic characters.—Antennae 13-jointed with 2 ring joints; funicle 6-jointed; occiput with a foraminal margin; thoracic dorsum clothed with appressed silvery-white hairs; mesepimeron without an incision, but with a rather deep depression just beyond the middle; spiracular sulci conspicuous; stigmal vein nearly sessile with hair veins radiating from it; postmarginal vein as long as the combined width of marginal plus the length of stigmal vein; marginal vein three-fifths as long as submarginal; wings hyaline; hind femora smooth on their lower margin; first and second segments of abdomen slightly incised.

Platykula can be separated from its most closely related genera as follows: *Dimeromicrus* Crawford does not have white appressed hairs, a depression in the mesepimeron, spiracular sulci, and a short pronotum; it has the third and fourth abdominal segments incised. *Idiomacromerus* Crawford has a stigmal vein that is nearly half as long as the marginal and only a little shorter than the postmarginal and a spotted wing; it does not have appressed hairs on the body. *Liodontomerus* Gahan has a long stigmal vein, which in the type is about two-thirds as long as the post marginal and four-fifths as long as the marginal; it does not have spiracular sulci, and a margined occipital foramen. It also differs from *Plesiostigmodes* Ashmead in some important respects.

PLATYKULA ALBIHIRTA (Ashmead)

Syntomaspis albihirta ASHMEAD, Trans. Amer. Ent. Soc., vol. 14, 1887, p. 187.

Female.—Length 2.5 mm.; ovipositor 0.8 mm. Entirely black. Head transverse, wider than the thorax, and minutely punctured;

antennae attached a little below the middle of the front, the antennal depression very shallow; scape, pedicel and two ring-joints testaceous; pedicel and ring-joint combined longer than the first joint of the funicle; joints of funicle all longer than wide and somewhat darker than the scape, and gradually growing wider toward the tip; the ocellular line about twice the length of the diameter of the median ocellus; eyes reddish. Thorax shorter than the abdomen and minutely punctuate; parapsidal furrows not very distinct, visible only at certain angles; propodeum with a median carina and large pits at the anterior margin; coxae fuscous, the femora a lighter brown; fore and mid tibiae testaceous, the hind ones fuscous, except the tips; tarsi with last joint brown. Abdomen very flat, the segments almost truncate dorsally; fourth segment about one-third longer than the third; ovipositor shorter than the abdomen.

Male.—Length 1.3 mm.; scape and flagellum dark brown; legs a little darker than in the female. Abdomen greatly depressed.

Type locality.—Jacksonville, Fla.

Host.—Unknown.

Type.—Cat. No. 25406, U.S.N.M.

Redescribed from the female type and a male from the same locality. Both these specimens are in the National collection, and the male is here described for the first time.

DIMEROMICRUS HOWARDI (Dalla Torre)

Torymus ventralis HOWARD, Journ. Linn. Soc. Lond. Zool., vol. 26, 1896, p. 135.

Torymus howardi DALLA TORRE, Cat. Hymen., vol. 5, 1898, p. 307. New name for *Torymus ventralis* Howard preoccupied by *Torymus ventralis* Fonscolombe.

Type locality.—Grenada, West Indies.

Host.—Unknown.

Type.—Cat. No. 6541, U.S.N.M.

The type consists of a single male specimen collected by H. H. Smith and recorded under No. 30. It is in a very poor condition for study and hence it has been difficult to classify it; I have placed it tentatively in the above-named genus.

DIMEROMICRUS EUCALYPTI (Ashmead)

Torymus eucalypti ASHMEAD, Proc. Linn. Soc. New South Wales, vol. 30, 1900, p. 331.

Type locality.—Sydney, New South Wales.

Host.—Unknown.

Type.—Cat. No. 4877, U.S.N.M.

Originally described from eight specimens. The National collection contains seven specimens, four of which are somewhat broken. This species is very close to *Dimeromicrus australiensis* Girault.¹³

¹³ Mem. Queen. Mus., vol. 4, p. 277.

DIMEROMICRUS GIFUENSIS (Ashmead)

Torymus gifuensis ASHMEAD, Journ. New York Ent. Soc., vol. 22, 1904.

Type locality.—Japan.

Host.—Unknown.

Type.—Cat. No. 7146, U.S.N.M.

This species was described from one male and two females, taken in October, 1902. In the National collection.

DIAMORUS AXILLARIS (Ashmead)

Torymus axillaris ASHMEAD, Trans. Amer. Ent. Soc., vol. 21, 1894, p. 333.

Type locality.—Morgantown, W. Va.

Host.—Unknown.

Type.—Cat. No. 25405, U.S.N.M.

Described from one female taken May 11, 1891, by Dr. A. D. Hopkins and recorded under No. 3301. Deposited in the National collection.

MICRODONSOMERUS ANTHIDII (Ashmead)

Torymus anthidii ASHMEAD, Ent. News, vol 7, 1896, p. 26.

Type locality.—Los Angeles, Calif.

Host.—From a cell of (*Anthidium*) *Dianthidium consimile* (Ashmead).

Type.—Cat. No. 25404, U.S.N.M.

The National collection contains nineteen specimens.

CRYPTOPRISTRUS LAZUELLA (Ashmead)

Syntomaspis lazuella ASHMEAD, Bull. Colo. Biol. Assoc., vol. 1, 1890, p. 26.

Type locality.—West Cliff, Colo.

Host.—Unknown.

Type.—Cat. No. 25403, U.S.N.M.

Besides the type female the National collection contains 20 specimens bearing No. 632.

EXPLANATION OF PLATES

The first three plates illustrate the shape of the stigmal veins of most of the species of *Callimome* mentioned in this paper. The sketches were all made by the author with the aid of a compound microscope and a camera lucida. All are drawn to the same scale.

PLATE I

Stigmal veins of *Callimome*

- FIG. 1. *Callimome thalassinum* (Crosby).
 2. *Callimome montserratii* (Crawford).
 3. *Callimome umbilicatum* (Gahan).
 4. *Callimome osborni* Huber.
 5. *Callimome holcaspoidea* (Ashmead).
 6. *Callimome solidaginis* Huber.

FIG. 7. *Callimome lividum* (Ashmead).

8. *Callimome punctifrons* (Ashmead).
9. *Callimome neuroterum* (Ashmead).
10. *Callimome dasyneuræ* Huber.
11. *Callimome aeneum* Ashmead.
12. *Callimome hainesi* (Ashmead).
13. *Callimome sativæ* Huber.
14. *Callimome bicoloratum* Huber.
15. *Callimome rubenidis* Huber.
16. *Callimome minutissimum* Huber.
17. *Callimome prunicola* Huber.
18. *Callimome tarsale* Huber.
19. *Callimome rohveri* Huber.
20. *Callimome hirsutum* Huber.
21. *Callimome capillaceum* Huber.
22. *Callimome anthomyiæ* (Ashmead).
23. *Callimome dryophantæ* (Ashmead).
24. *Callimome smithi* (Ashmead).
25. *Callimome rugosipunctatum* (Ashmead)
26. *Callimome cruentatum* Huber.
27. *Callimome tricolor* Huber.
28. *Callimome albitarsæ* Huber.
29. *Callimome multicolor* Huber.
30. *Callimome advenum* Osten Sacken.
31. *Callimome tubicola* Osten Sacken.
32. *Callimome occidentale* Huber.
33. *Callimome brodiei* (Ashmead).
34. *Callimome melanocerae* Ashmead.
35. *Callimome gahani* Huber.
36. *Callimome warreni* (Cockerell).
37. *Callimome mexicanum* (Ashmead).
38. *Callimome giganticum* Huber.
39. *Callimome racemareæ* Ashmead.
40. *Callimome coeruleum* Ashmead.
41. *Callimome elegantissimum* Ashmead.

PLATE 2

Stigmal veins of *Callimome*

All the species illustrated on this plate belong to Group B.

FIG. 42. *Callimome bedeguaris* (Linnaeus). Genotype. (European).

43. *Callimome druparum* (Boheman).
44. *Callimome sapporensis* (Ashmead).
45. *Callimome atripleicis* Huber.
46. *Callimome flavicoxum* Osten Sacken.
47. *Callimome fulvum* Huber.
48. *Callimome alamcdensis* Huber.
49. *Callimome dubiosum* Huber.
50. *Callimome longitigum* Huber.
51. *Callimome strobiloides* Huber.
52. *Callimome amelanchieris* (Cushman).
53. *Callimome sylvicola* (Ashmead).
54. *Callimome japonicum* (Ashmead).

- FIG. 55. *Callimome duplicatum* Huber.
 56. *Callimome aeneoscapum* Huber.
 57. *Callimome baccharidis* Huber.
 58. *Callimome asteridis* Huber.
 59. *Callimome alaskensis* Huber.
 60. *Callimome ebrium* Osten Sacken.
 61. *Callimome ferrugineipes* Huber.
 62. *Callimome magnificum* Osten Sacken.
 63. *Callimome chrysochlora* Osten Sacken.
 64. *Callimome sackeni* Ashmead.
 65. *Callimome mellipes* Huber.
 66. *Callimome persimilis* (Ashmead).
 67. *Callimome citripes* Huber.
 68. *Callimome flaviventre* (Ashmead).
 69. *Callimome missouriensis* Huber
 70. *Callimome coloradensis* Huber.
 71. *Callimome hircinum* (Ashmead.)
 72. *Callimome pilularidis* Huber.

PLATE 3

Stigmal veins of *Callimome*. Leg of *Monodontomerus* and *Callimome*

Numbers 73 to 90, inclusive, represent European species, not discussed in the text, that are in the National collection. The remaining numbers represent native species. The two sketches at the bottom represent parts of the hind legs of the genus *Callimome* and the genus *Monodontomerus*. The rather prominent spurs on the lower margin of the hind femora serve to distinguish the two genera. This however, is not the only point of difference.

- FIG. 73. *Callimome nobilis* (Boheman).
 74. *Callimome tipulariarum* (Zetterstedt).
 75. *Callimome abbreviatum* (Boheman).
 76. *Callimome glechomae* (Mayr).
 77. *Callimome lasiopterae* (Giraud).
 78. *Callimome macropterum* (Walker).
 79. *Callimome amoenum* (Boheman).
 80. *Callimome regium* (Nees).
 81. *Callimome lazulina* (Förster).
 82. *Callimome speciosum* (Boheman).
 83. *Callimome auratum* (Fourcroy).
 84. *Callimome eurynotum* Walker.
 85. *Callimome fastuosum* (Boheman).
 86. *Callimome pallidicornis* (Boheman).
 87. *Callimome erucarum* (Schrank).
 88. *Callimome igniceps* (Thompson).
 89. *Callimome caudatum* (Boheman).
 90. *Callimome abdominale* (Boheman).
 94. *Callimome sulcatum* Huber.
 95. *Callimome rhoditidis* Huber.
 96. *Callimome rosae* Huber.
 97. *Callimome rudbeckiae* (Ashmead).
 98. *Callimome scalaris* Huber.
 99. *Callimome kinseyi* Huber.
 100. *Callimome capite* Huber.

PLATE 4

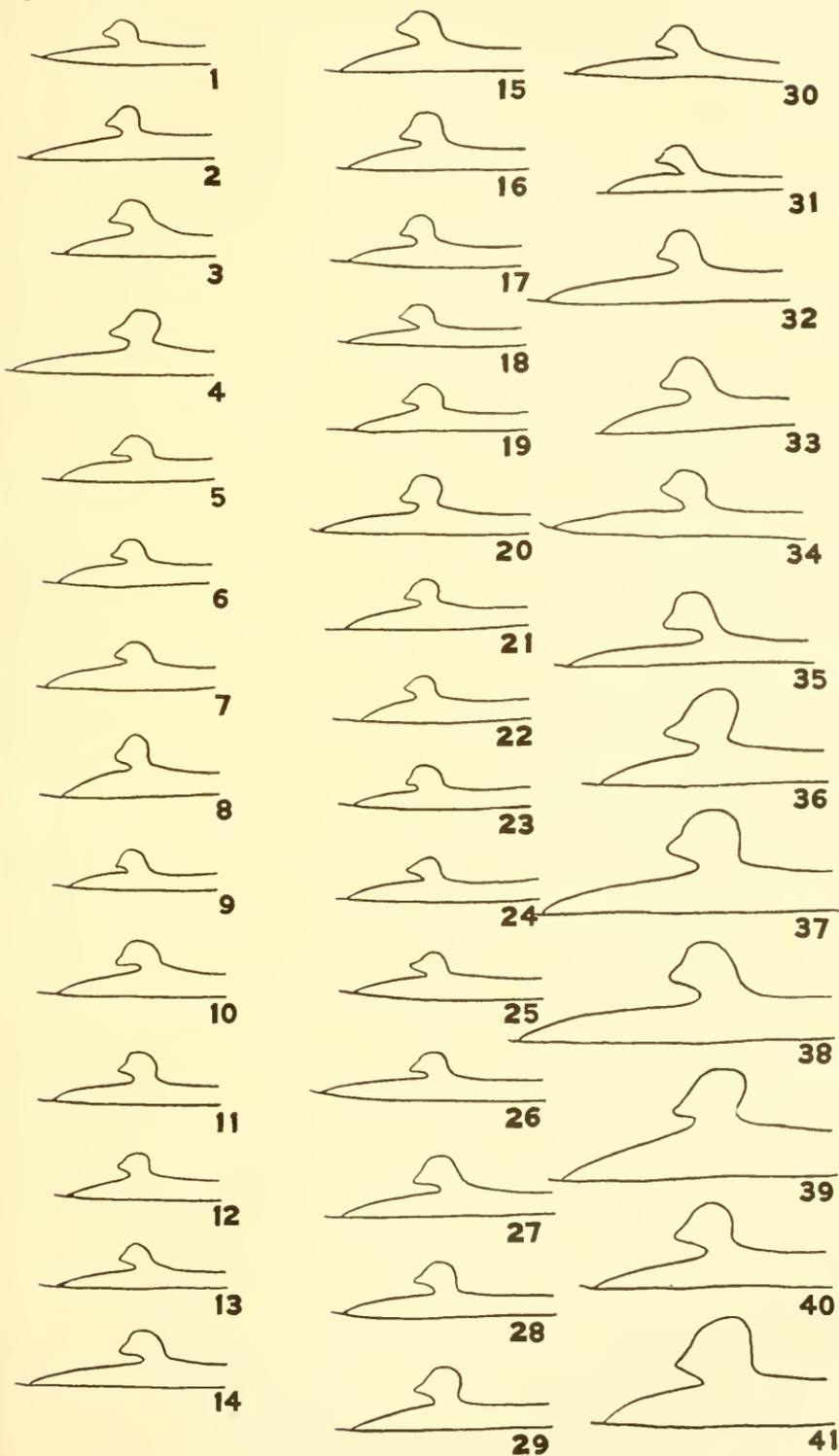
Callimome adult and details

The large drawing represents a typical specimen of Group A. It will be noted that the stigmal vein is sessile and that the cross furrow is present on the apical one-third of the scutellum. In Group B the stigmal vein is petioled and the cross furrow on the scutellum is generally not readily conspicuous. The smallest joint of the antennae is the ring-joint. The submarginal vein is always longer than the marginal vein.

For subfamily characters the reader will observe the two tibial spurs on the hind tibia, the relatively smooth lower margin of the femora, and the thirteen joints of the antenna. The comparative sizes of the fore and hind femorae are also shown (fig. 4).

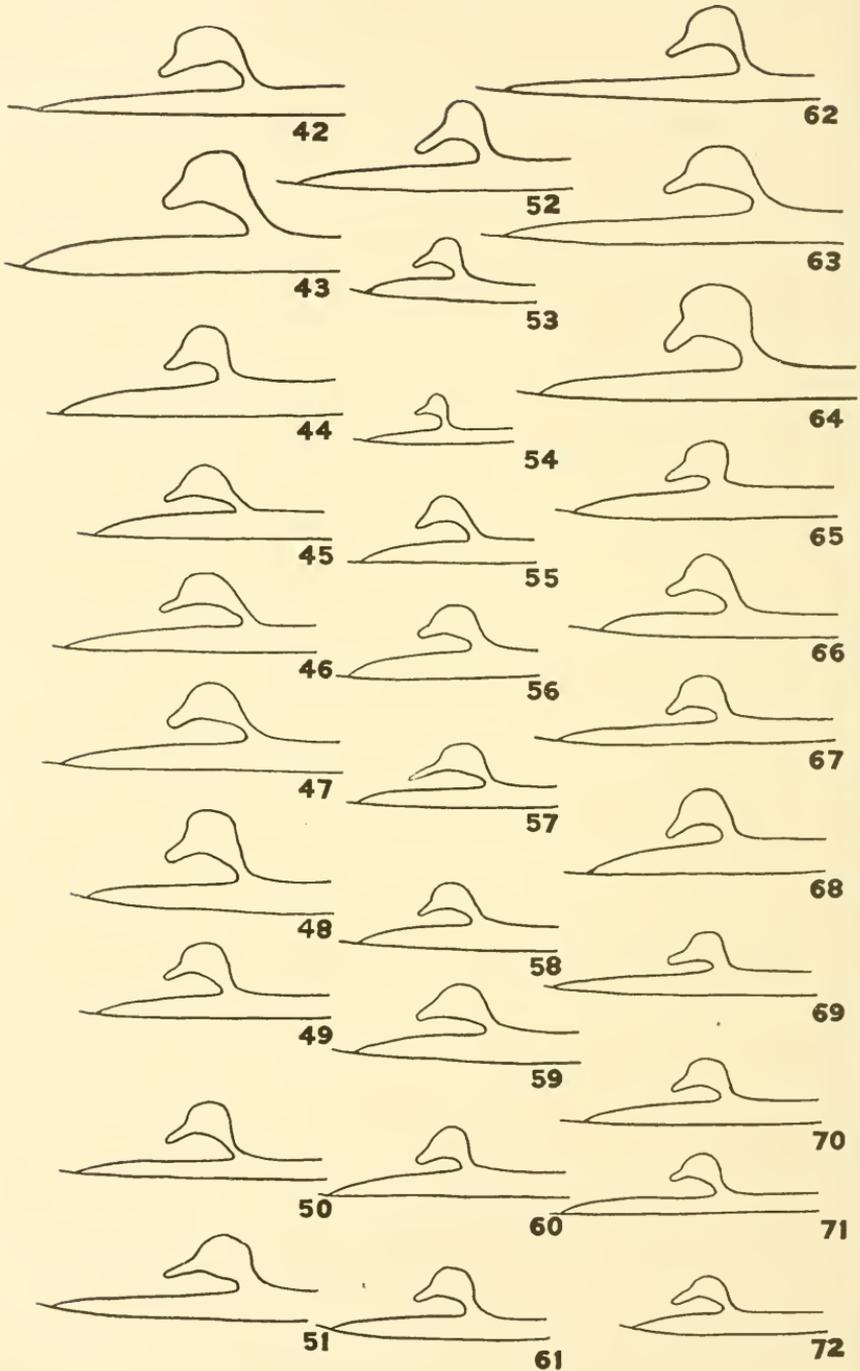
There are in the main two principal types of sculpture. The most common type in Group A is made of punctures of various sizes. On the smaller species the punctures are generally very close together, while on species as large as *californicum* the punctures are very large. The two sketches (figs. 1 and 2) are drawn to scale from areas on the thorax. Most of the species in group B have a more rugose type of sculpture as is indicated in the sketch to the right (fig. 3).

The side view drawing (fig. 5) of the thorax shows the principal characters mentioned in the keys.



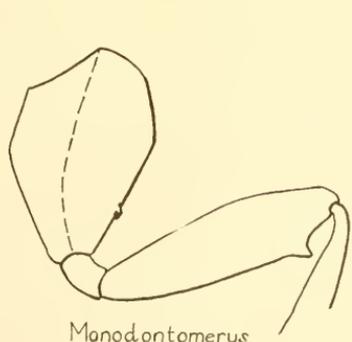
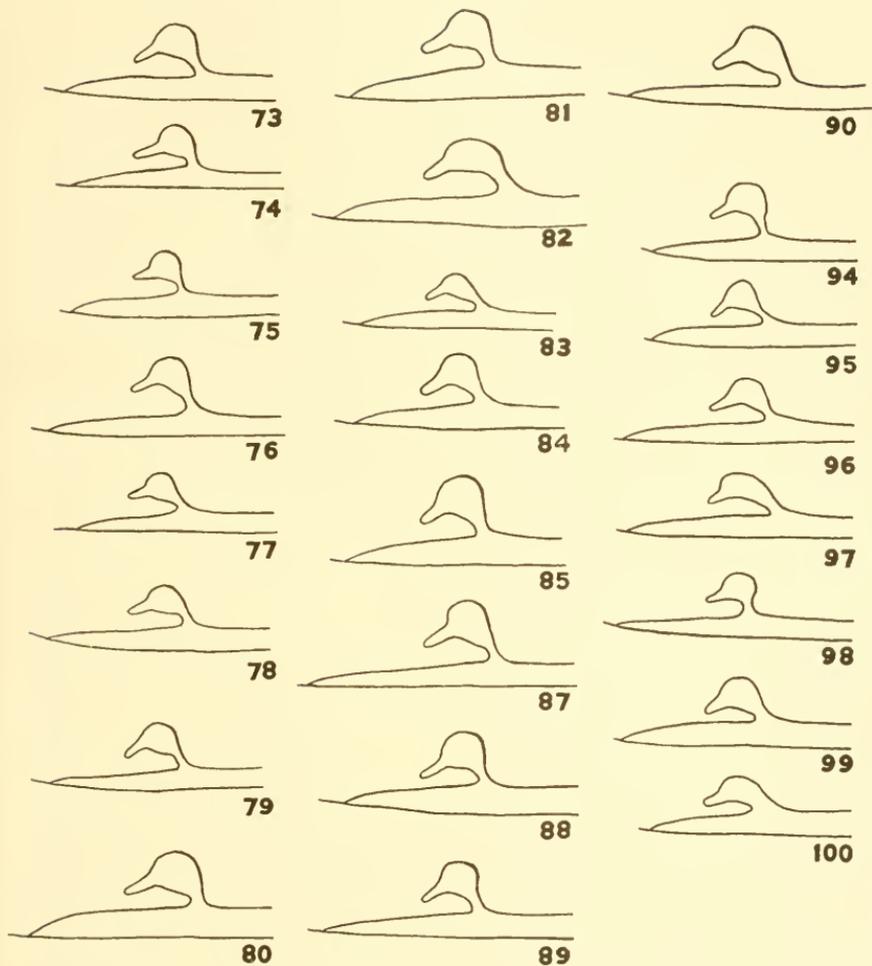
STIGMAL VEINS OF CALLIMOME

FOR EXPLANATION OF PLATE SEE PAGE 108 AND 109

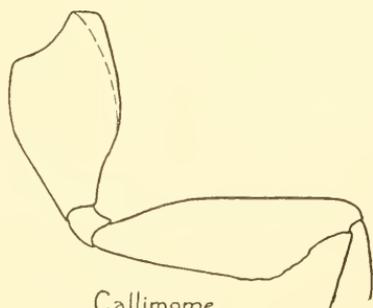


STIGMAL VEINS OF CALLIMOME

FOR EXPLANATION OF PLATE SEE PAGE 109 AND 110



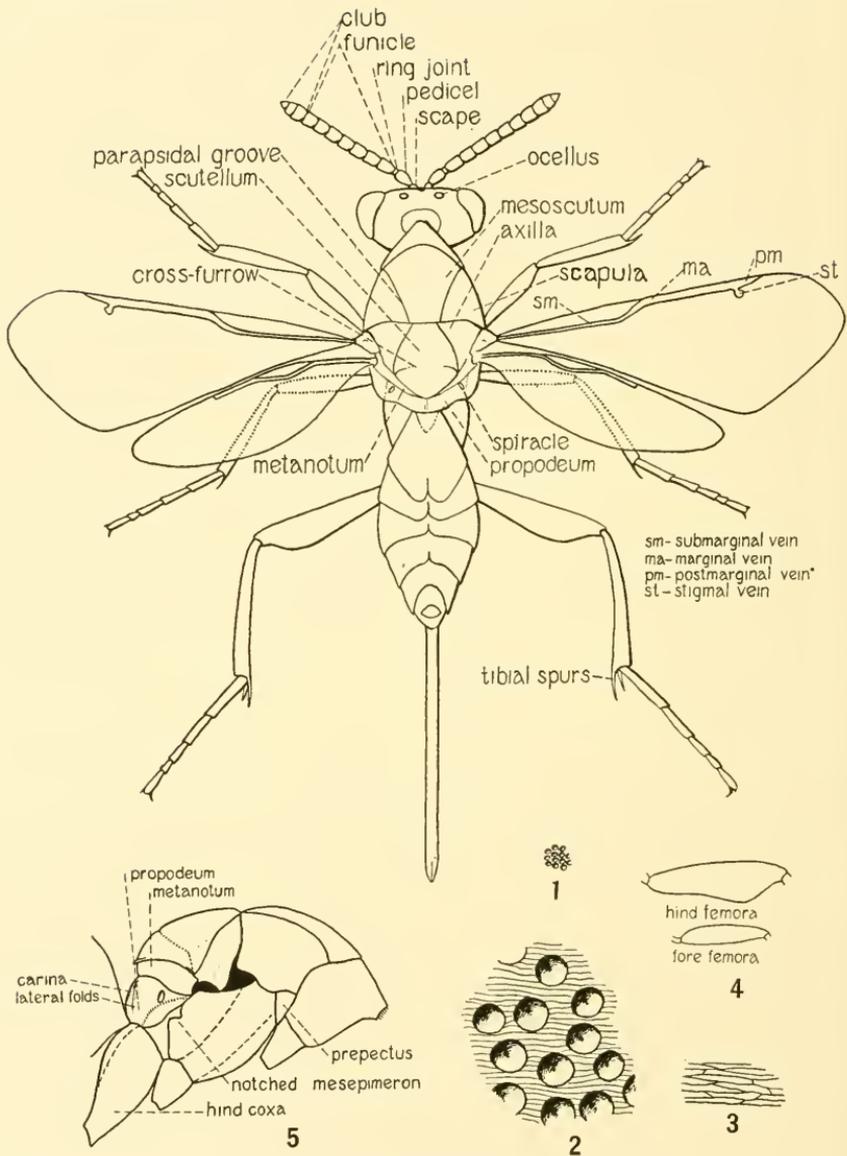
Monodontomerus



Callimome

STIGMAL VEINS OF CALLIMOME

FOR EXPLANATION OF PLATE SEE PAGE 110



CALLIMOME ADULT AND DETAILS

FOR EXPLANATION OF PLATE SEE PAGE 111

SPECIES INDEX

The following index includes all the species of chalcid-flies treated in this paper. Valid generic names are in **boldface**; valid specific names in roman; synonymy in *italics*.

	Page		Page
abortum (Crosby) <i>Torymus</i>	102	dubiosum, new species.....	24
<i>advena</i> (Osten Sacken) Ashmead, <i>Syntomas-</i>		duplicatum, new species.....	27
<i>pis</i>	60	durum Osten Sacken.....	25
advenum Osten Sacken.....	97	ebrium Osten Sacken.....	24
aca Walker.....	102	elegantissimum Ashmead.....	89
aeneoscapum, new species.....	35	eucalypti (Ashmead) <i>Torymus</i>	107
aeneum Ashmead.....	55	<i>eurynotus</i> , Förster.....	2
aereum, new species.....	71	<i>fagopyrum</i> Provancher.....	29
alamedensis, new species.....	28	ferrugineipes, new species.....	33
alaskensis, new species.....	31	flavicoxum Osten Sacken.....	25
albihirta (Ashmead) <i>Syntomaspis</i>	106	<i>flaripes</i> (Ashmead) <i>Megastigmus</i>	102
albitarse, new species.....	80	flaviventre (Ashmead) <i>Torymus</i>	41
Allotorymus , new genus.....	104	fullawayi, new name.....	19
amelanchieris (Cushman) <i>Syntomaspis</i>	22	fulvum, new species.....	26
anthidii (Ashmead) <i>Torymus</i>	108	gahani, new species.....	69
anthomyiae (Ashmead) <i>Torymus</i>	54	giftuensis (Ashmead) <i>Torymus</i>	108
<i>asphondyliae</i> Gahan.....	75	giganticum, new species.....	65
asteridis, new species.....	43	hainesi (Ashmead) <i>Torymus</i>	75
atriplexis, new species.....	44	hircinum (Ashmead) <i>Torymus</i>	25
axillaris (Ashmead) <i>Torymus</i>	108	hirsutum, new species.....	74
aztecum (Cameron) <i>Torymus</i>	97	holeaspoidea (Ashmead) <i>Syntomaspis</i>	91
baccharidis, new species.....	46	howardi (Dalla Torre) <i>Torymus</i>	107
bacdeguaris (Linnaeus).....	2	japonicum (Ashmead) <i>Torymus</i>	41
bicoloratum, new species.....	73	kinseyi, new species.....	44
<i>brevicauda</i> Osten Sacken.....	29	koebeleri, new species.....	52
<i>brevissimicauda</i> Ashmead.....	29	lazuella (Ashmead) <i>Syntomaspis</i>	108
brodiei (Ashmead) <i>Syntomaspis</i>	70	lissum Walker.....	102
bruesi, new name.....	19	lividum Ashmead.....	53
californicum (Ashmead) <i>Syntomaspis</i>	87	longicaudum Provancher.....	102
californicum subdolum, new variety.....	85	longistigmum, new species.....	47
Callimome Spinola.....	2	maculiperne (Cameron,) <i>Syntomaspis</i>	86
capillaceum, new species.....	74	magnifenum Osten Sacken.....	36
capite, new species.....	32	<i>medicaginis</i> (Gahan) <i>Syntomaspis</i>	77
castanopsidis, new species.....	64	melanocerae Ashmead.....	67
cecidomyiae Walker.....	100	mellipes, new species.....	23
<i>cecidomyiae</i> (Walker) (Ashmead) <i>Torymus</i>	31	mexicanum (Ashmead) <i>Torymus</i>	62
chrysochlora Osten Sacken.....	37	minutissimum, new species.....	78
cinerosum, new species.....	84	<i>Misocampus</i> Latreille.....	2
<i>cissum</i> (Dalla Torre) <i>Torymus</i>	102	missouriensis, new species.....	42
<i>citiformis</i> Ashmead.....	67	montseratti (Crawford) <i>Torymus</i>	77
citripes, new species.....	48	multicolor, new species.....	51
coccineum, new species.....	68	neuroterum (Ashmead) <i>Torymus</i>	99
<i>coerulea</i> Fullaway, <i>Syntomaspis</i>	19	occidentale, new species.....	79
coeruleum Ashmead.....	63	ochreatum (Say) <i>Torymus</i>	104
coloradensis, new species.....	49	<i>omnicorae</i> (Ashmead) <i>Torymus</i>	55
cruentatum, new species.....	50	osborni, new species.....	93
cyaneus (Boheman).....	2	<i>ostensackeni</i> (Dalla Torre) <i>Torymus</i>	29
dasyneurae, new species.....	56	pallidipes (Ashmead) <i>Torymus</i>	103
druparium (Boheman) <i>Torymus</i>	20	pavidum (Say) <i>Torymus</i>	103
dryophantae (Ashmead) <i>Syntomaspis</i>	53	perplexum, new species.....	49
<i>dryorhizoneni</i> Ashmead.....	55	persimilis (Ashmead) <i>Torymus</i>	19

	Page		Page
<i>pilularidis</i> , new species	45	<i>splendens</i> (Provancher) <i>Syntomaspis</i>	105
Platykula , new genus	106	<i>splendidulus</i> (Dalla Torre) <i>Torymus</i>	101
<i>prunicola</i> , new species	91	<i>splendidus</i> (Barnstorf)	101
<i>punctifrons</i> (Ashmead) <i>Syntomaspis</i>	59	<i>strobiloides</i> , new species	40
<i>racemareae</i> Ashmead	82	<i>subdolum</i> , new variety of <i>californicum</i>	85
<i>rhoditidis</i> , new species	34	<i>sulcatum</i> , new species	22
<i>robustum</i> , new species	72	<i>sylvicola</i> (Ashmead) <i>Torymus</i>	34
<i>rohweri</i> , new species	58	<i>Syntomaspis</i> Förster	2
<i>rosae</i> , new species	35	<i>tarsale</i> , new species	76
<i>rubenidis</i> , new species	78	<i>thalassinum</i> (Crosby) <i>Syntomaspis</i>	57
<i>rudbeckiae</i> (Ashmead) <i>Torymus</i>	23	<i>theon</i> Walker	102
<i>rugospunctatum</i> (Ashmead) <i>Torymus</i>	95	<i>thompsoni</i> (Fyles) <i>Torymus</i>	103
<i>sackeni</i> Ashmead	29	<i>Torymus</i> Dalman	2
<i>sackeni</i> (Brues) <i>Torymus</i>	19	<i>tricolor</i> , new species	96
<i>sapporeusis</i> (Ashmead) <i>Torymus</i>	41	<i>tubicola</i> Osten Sacken	60
<i>sativae</i> , new name	77	<i>tubularis</i> , new species	39
<i>scalaris</i> , new species	21	<i>umbilicatum</i> (Gahan) <i>Syntomaspis</i>	94
<i>smithi</i> (Ashmead) <i>Torymus</i>	99	<i>ventralis</i> (Howard) <i>Torymus</i>	107
<i>solidaginis</i> , new species	92	<i>virentis</i> Ashmead	29
<i>solitaria</i> Osten Sacken	57	<i>warreni</i> (Cockerell) <i>Syntomaspis</i>	81