DISTRIBUTION AND TAXONOMY OF THE GENUS CYBAEUS IN OREGON (ARACHNIDA: AGELENIDAE)

by

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DISTRIBUTION AND TAXONOMY OF THE GENUS CYBAEUS IN OREGON (ARACHNIDA: AGELENIDAE*)

PART I. INTRODUCTION

During the summer of 1947, and the years 1948 and 1949, the author made a number of collecting trips in Western Oregon in search for spiders of the family Agelenidae to use for a taxonomic thesis. In the fall of 1949 a collecting trip which covered 1550 miles was made into Southern and Eastern Oregon. A study of the spiders collected on the trip revealed a large number of new species in several genera. A survey of the family Agelenidae indicated that a thorough taxonomic study of the family was too great a project for a masters thesis. After discussions with Dr. C. H. Martin and Mrs. Don L. Frizzell, a study of the female genitalia of the genus Cybaeus in Oregon was selected as a good problem. This genus was represented at the time by 11 species and one variety. The males were unknown for three species, a male paratype designated but not

* Kaston (5, p. 278) states, "Petrunkevitch, following Thorell, has recently adopted the orthography Agalenidae. Thorell (1970) changed the spelling of Agelena to Agalena, assuming that a mistake in transcription from the Greek has been made. But Walckenaer, in erecting the genus did not give any derivation, and as there seems to be some difference of opinion among later authors concerning the derivation, I prefer to use the original orthography. (Cf. Opinion 34 of the International Rules of Nomenclature)."
described for one, and a female was unknown for one species. The similarity between several species indicated the possibilities of problems in synonymy. Specimens of all the known species found in Oregon, with the exception of the male of C. septatus Ch. and Ivie, were available to the author for study. Also, three new species and two undescribed sexes were on hand.

PROCEDURE. Since the more complex structures of the female genitalia lie internally, the following procedure was necessary to prepare the genitalia for study. The female genitalia of each species was dissected from several specimens, the number depending upon the supply, and boiled in 10% KOH for a few minutes to remove the fatty tissue. Then each specimen was washed in water, passed through graded alcohols to absolute alcohol, and placed in clove oil for clearing and study.

The drawings were outlined by means of an ocular cross hatch and graph paper. The figures were then transferred to Coquille Board, outlined in black ink, filled in with a black wax pencil, and touched up with white ink.

The drawings were not made to any definite scale but were drawn to a convenient size which, in some cases,
depended upon the complexity of the structure. The smaller setae, which apparently have no taxonomic value, were omitted from all figures of the external female genitalia, the male patellae, and partially from the male palpi.

PHYLOGENETIC RELATIONSHIPS. The arrangement of species in this paper is an attempt, by the author, to indicate their phylogenetic relationships. In tracing such relationships the writer follows W. J. Gertsch who believes that reduction of morphological structures indicates a higher type of development. Gertsch (4, p. 105), in a discussion of Arachnid morphology, states: "The tendency has been to simplify the fundamental systems, to make fewer segments and functional units (such as book lungs, tracneae, ostia, spinnerets) do the work of the greater ancestral number."

The phylogenetic arrangement for Cybaeus has been made primarily on the basis of the external and internal genitalia of the female. The reduction of the number of spermathecae and the simplification of the internal female genitalia are interpreted as an indication of specialization. Also other structures have been used to supplement the major characters. The arrangement of the species has been from complex to simple.
KEY TO THE GENERA OF CYBAEINAE. Three closely related genera have been erected by R. V. Chamberlin and W. Ivie, Cybaeozyga, Cybaeota and Cybaeina. The following key will separate the North American genera.

1. Lateral eyes a diameter apart.

..........................Cybaeozyga Ch. and Ivie

Lateral eyes less than a diameter apart........2

2. Tibia I with no more than three pair of long spines ventrally. Chelicerae usually geniculate.

..........................Cybaeus L. Koch

Tibia I with four or five pair of spines ventrally. Chelicerae straight.................3

3. Abdomen usually marked with light gray chevrons.

Tibia I with five pair of long robust spines ventrally..................Cybaeota Ch. and Ivie.

Abdomen unmarked. Tibia I with four or five pair of moderately strong spines ventrally.

..........................Cybaeina Ch. and Ivie.
The genus Cybaeus was erected in 1868 by L. Koch on the basis of two species, C. angustiarum n. sp. and Amaurobius tetrarchus C. Koch which was described in 1839. The latter species was designated as the genotype. Since this time additional species have been described from Japan, Africa, Europe, and North America. L. Koch's description (7, p. 46-47) of the genus (translated from German by Miss Lewis of Oregon State College) is as follows:

"The cephalothorax either as long as patella and tibia of the fourth pair legs of the male or longer than the patella and tibia of the fourth pair of legs in the female. The sides slightly rounded, front becoming moderately narrow, the head part arched on top and laterally. A middle furrow is always present.

"The front row of eyes are straight, removed by double their diameter from the edge of the head, eyes equally in distance from each other, the middle ones round and the lateral larger and oval in size; the latter on a common
level with the posterior side eyes and somewhat removed from them.

"The posterior row arched by deep position of side eye, equally large, the eyes equally far distant or the median eyes further distinct from each other than from the side eyes.

"The mandibles arched forth, knee-like at base, as thick or thicker than front thigh.

"Maxillae arched without impression, the lip almost quadratic, notched lightly forward and round.

"Uppermost pair of spinnerets are one segmented and there is no cribellum.

"No calmistrum on metatarsi on fourth leg; no scopula. On the tarsi there is a pseudo-claw.

"Length ratio 4.1.2.3. or 1.4.2.3. (tetricus male)"

In 1932 R. V. Chamberlin and W. Ivie reviewed the genus Cybaeus in North America. In this review they studied a specimen of C. tetricus C. Koch from France. This was not the genotype. As a result of these studies they published a more detailed description of the genus by the following changes and additions:

"Clypeus ---- varies from slightly less than (diameter of an ALE) this diameter to two and a half times the diameter. Chelicerae ---- geniculate at base, only rarely being more nearly straight -----. Two or three pairs (spines) on ventral side of tibia I and II -- --."
This general discussion of the Oregon species of Cybaeus is intended to give the reader an overall view and understanding of the species as they are known from Oregon. Those characters which vary consistently between the different species will be discussed in the specific descriptions.

The original descriptions are not included because in most cases they are very brief. Also, the authors were not consistent with the characters used to describe the species. This paper presents uniform descriptions of the various species of Cybaeus in Oregon.

The reader is referred to the glossary for the meaning of the abbreviations and some of the technical terms used in this paper.

GENERAL STRUCTURE. The Oregon species of Cybaeus range in size from 2.3 mm. to 14 mm. The carapace is convex, elongate, 2/3 to 3/4 as wide as the thorax and more or less truncate behind. The head region is strongly convex and slopes forward, the highest part at the anterior end of the thoracic furrow in the males and midway between the thoracic furrow and the posterior row of eyes in the females. The thoracic furrow lies
longitudinally at the base of the head and from this point the thorax drops off gradually to the lateral and posterior edges.

The eight eyes lie in two rows, occupying about 2/3 of the transverse distance of the head. The anterior eye-row is straight or very slightly recurved while the posterior eye-row is slightly longer and is usually slightly recurved but seldom straight. This character varies slightly in the same species. The AME's are much the smallest (except in C. signifer Simon in which the AME's are almost as large as the ALE's) and the remainder, ALE's, PSE's, and PME's are similar in size but decrease slightly in the order given. The clypeus varies from one to more than one and one-half times the diameter of an ALE. The chelicerae are moderately to strongly geniculate (slightly less in the males than in the females, slightly geniculate in C. signifer Simon, and straight in C. tuberculatus n. sp.). The upper margin of the furrow of the chelicera is armed with one large center tooth with a smaller tooth flanking it on each side. The lower or hind margin is usually armed with 4 to 6 teeth and 4 to 6 denticles, the number varying somewhat in the same species. The furrow of C. tuberculatus n. sp. is armed with 3 teeth and 7 denticles. The chelicera bears a narrow scopula along
the mesal edge and a row of hairs overlapping the fang. The endites are 2/3 as wide as long, bearing a serrula along the distal-mesal edge. The section bearing the scopula is membranous. The labium is slightly wider than long and extends about 1/2 the length of the endites. The labium is membranous distally and bears an irregular row of hairs across the membranous area. The sternum is shield-shaped, longer than broad, and slightly angulate along the margins opposite the coxae. A short nipple-like process extends posteriorally from the sternum.

The legs are moderately stout, the tibial index is approximately 13 to 16. The hind legs are usually longest, followed in size by the first, second, and third pairs. The tarsi are terminated by paired claws which are usually armed ventrally with 6 or 8 teeth and a median claw which bears two teeth ventrally; R. V. Chamberlin and W. Ivie (2, p. 5) believed that the median claw bore only a single ventral tooth. The tarsi and metatarsi bear 5 to 7 trichobothria in a row dorsally. They increase in size distally and individually on both segments. The tibia bear 5 to 8 scattered trichobothria dorsally. The patellae and femora apparently lack these sensory hairs. The tibiae and tarsi of the female palpi and the tibiae of the male palpi bear trichobothria similar to that found on the
legs. The spination is fairly constant on the ventral part of the legs but the dorsal and lateral spines vary within the species. All tibiae are armed ventrally with three pair of spines (except _C. tuberculatus_ n. sp. which bears only two pair on tibia I and II). The metatarsi bear two pair of spines ventrally plus a distal set consisting of one spine flanked on either side by a ventro-lateral spine. The femora, patellae and tarsi are unarmed below. The spines are more numerous and irregularly placed dorsally and laterally. On the dorsal and lateral surfaces there are 5 to 8 spines on the femur, one or two usually small spines on the patella, 3 to 6 on the tibia, the same on the metatarsus and none on the tarsus. The female palpi bear scattered spines ventrally and dorsally on the patellae and two dorsally on the tibia. The male bears four spines dorsally on the femora, one on the patellae and scattered spines on the tibia and cymbium.

The lorum of the pedicle is divided transversely into two parts by a straight, curved, or notched suture. The abdomen is ovate, slightly overlapping the carapace. The spinnerets are sub-apical in position. The anterior spinnerets are the longest, contiguous at the base, and consist of two segments, a large conical basal segment terminated by a very small hemispherical segment. The
latter segment is terminated by a number of spinning tubes. The median spinnerets are apparently fused at the base and consist of one broad conical segment which is much smaller than the anterior basal segment and is terminated by a number of spinning tubes. The posterior spinnerets are widely separated, shorter, and more slender than the anterior spinnerets. They have been described as single segmented (2, p. 4) but in some specimens the spinnerets are apparently two-segmented, the distal segment being faintly but definitely differentiated. The colulus is vestigial, consisting of 6 to 18 small setae at the base of the anterior spinnerets. Anterior to the colulus is the broad sclerotized spiracular plate which is free and rounded posteriorly.

The mature males are similar to the females, but, as a rule, are smaller. The head of the male is narrower and the carapace wider, the chelicerae not as geniculate, the legs slightly longer, the abdomen smaller and in the case of C. scopulatus Ch. and Ivie* the male bears a dense scopula ventrally on Tibia I which the female and immature males lack.

* The abbreviation Ch. and Ivie for R. V. Chamberlin and W. Ivie is used throughout this paper.
MALE GENITALIA. The male palpi are moderately long, extending to or just past the patella of Leg I. The femur is unmodified. The patella is short and stout, usually bearing a stout, ectal process distally. This process varies from the thumb-like process on *C. simplex* n. sp. to *C. tuberculatus* n. sp. which lacks a process but retains a faintly darkened area near the ectal-distal edge of the patella. The patellar process is armed distally, or more commonly dorsally, with 10 to 30 or more stout, black teeth. These have no special pattern but are usually found within certain limited areas. One stout spine arises at the dorsal-distal edge of the patella and immediately ectally is a minute, darkly sclerotized tubercle or spur. The tibia is usually similar in size to the patella; it bears two processes, one meso-distally and one ecto-ventrally. *C. simplex* n. sp. bears only one ecto-ventrally and *C. tuberculatus* n. sp. bears two ectally but none mesally. The mesal edge is usually produced distally to form a short conical process. The carina-like ecto-ventral process lies longitudinally from one-half to the full length of the tibia and appears to be a fold of the cuticula. In *C. exlineae* Ch. and Ivie the fold lies on the distal quarter of the tibia. The cymbium is broad at the base, becoming slightly wider opposite the alveolus and
tapering, gradually to strongly, to a blunt point. The palpal organs of the male are quite simple and moderately small except in *C. reticulatus* Simon where they are quite large. The organ consists essentially of a basal haematodocha, a cup-shaped sub-tekulum, an intermediate haematodacha, a tegulum, a long slender whip-like em-bolus (longest in *C. reticulatus* Simon) which arises mesally, extending distally and ectally where it is re-ceived by the conductor. The conductor consists of a gutter-like process extending ectally about one-third the perimeter of the intromittent organ. A twisted or pointed caudal process is borne basally by the con-ductor.

FEMALE GENITALIA. The female genitalia consist of a thinly sclerotized sheet sparsely covered with setae through which portions of the internal genitalia may often be seen. The anterior portion of this sheet is often more or less transversely corrugated and in some species is provided with a pair of stabilizing pits. The sclerotized sheet is excavated posteriorally for the two openings of the connecting canals. The two openings of the connecting canal may open into a single median excavation or each may open into a lateral excavation. The extent of the excavation is quite var-iable between species. The excavation of *C. reticulatus*
Simon consists of a small rectangular area which lies medially along the posterior edge of the sclerotized plate, whereas the portion excavated in _C. cascadius_ n. sp. includes half or more of the entire sclerotized sheet. Between the fertilization ducts at the epigastric furrow arises an area devoid of setae which is designated as the calvous plate. This area extends from the ducts, anteriorly and medially, to the openings of the connecting canals, or, in a few cases, anterior of the openings as in _C. cascadius_ n. sp.

Internally the genitalia are usually strongly sclerotized. They consist of two, separate, and more or less identical right and left halves, each with a separate external opening and a separate internal discharge or fertilization duct. The external openings are quite variable in position and may be either near the posterior border of the sclerotized sheet and contiguous as in _C. reticulatus_ Simon, near the anterior border as in _C. simplex_ n. sp., or widely separated as in _C. signifer_ Simon.

Since the two halves of the genitalia are almost identical, only one section will be described in the following description and also in the specific descriptions.
The connecting canal extends from the external opening on the sclerotized sheet a short distance, usually anteriorly and ectally, to a sac-like cavity, the tertiary spermatheca. However, in *C. simplex* n. sp. it has the appearance of a blind canal. From the tertiary spermatheca the connecting canal extends a variable distance, usually posteriorly and mesally, and more or less gradually enlarges forming a globose or elongate secondary spermatheca (lacking on *C. simplex* n. sp.). In most of the species studied there is a specialized area at the posterio-mesal portion of the secondary spermatheca. It consists of a darkened globular mass, a small cavity, or indications of long cells or ducts. These areas were absent in *C. signifer* Simon and *C. multiloma* Ch. and Ivie. The function of these structures is unknown. A short connecting canal unites the secondary spermatheca with the egg or sphere-shaped primary spermatheca. The fertilization canal arises at the entrance of the connecting canal to the primary spermatheca and extends posteriorly where it drains into the vagina.

COLOR. The coloration of *Cybaeus* is dependent, to a considerable degree, upon the age of the specimen or the length of time since it last molted. The carapace on teneral specimens may be a light yellowish color,
whereas in more mature spiders the color may be a dark reddish brown. The dusky radiations and reticulations on the carapace and dusky annulations on the legs often vary in density in the same species. They may or may not be present. The carapace varies from a light yellow to a dark reddish brown, becoming darker anteriorly. The mouthparts are usually slightly darker than the anterior portion of the carapace and the legs and sternum are slightly lighter than the posterior portion. The eyes are ringed in black, the PME's separately and the ALE's and PLE's collectively as well as the AME's. The abdomen is light to dark gray with light gray markings in the form of a light gray median line on the anterior part of the abdomen with two large, light gray spots on either side and three or more, often indistinct, chevrons posterior of the median line. The abdomen is usually mottled gray laterally. The venter and spinnerets are light gray.

DISTRIBUTION. Ecological Distribution: The genus *Cybaeus* is represented in Oregon by hydrophilous spiders. They are usually found under rotten logs, bark, loose rock, or any large object lying on the ground. Also, they inhabit moss, forest duff, and rocky areas near streams. The writer's collecting experiences indicate that they are nocturnal creatures. However, a specimen
was observed during the daytime on a log in a very dark and damp forest. Also a few individuals were observed on gravel shores of creeks in cloudy or rainy weather. In all instances, the spiders were found in, or adjacent to, Douglas fir, cedar, or hemlock forests. The author has not found any species in pine forests.

**Geographical Distribution:** The genus *Cybaeus* is widely distributed over much of North America with the greatest concentration of species in the Pacific Northwest and Northern California. In Oregon the genus is found from the Washington to the California borders, and from the forests overlooking the ocean and eastward to and including the western slopes of the Cascade Mountains. Five of the fourteen species of *Cybaeus* in Oregon were collected on an area less than an acre in size at Cascadia, Oregon. These species were *euptypus* Ch. and Ivie, *reticulatus* Simon, *simplex* n. sp., *cascadius* n. sp., and *multnoma* Ch. and Ivie. This is the largest number of species collected in a single small area.

Only a few species were collected in Eastern Oregon. An undescribed species near *C. exlinae* Ch. and Ivie was collected in the Wallowa Mountains. *C. exlinae* Ch. and Ivie was collected in the Blue Mountains. A single specimen of *C. reticulatus* Simon was collected by Dr.
M. H. Hatch at Baker, Oregon which is in the Blue Mountains.
The Oregon species of *Cybaeus* may be divided into six natural groups primarily by means of the internal and external genitalia. Other structures and coloration are also of some aid. The following key will aid in separating the several groups. Further study may indicate that these groups are of subgeneric significance.

A more detailed description is presented as each group is described.

1. Tibia I with three pair of spines ventrally........2
   Tibia I with two pair of spines ventrally
   ..............................................TUBERCULATUS GROUP

2. AME's much smaller than the ALE's. Chelicerae strongly geniculate in the females and moderately so in the males.............................3
   AME's almost as large as ALE's. Chelicerae slightly geniculate in males and females......SIGNIFER GROUP

3. Cariniform process extending almost full length of the tibia of the male palpi; conductor normal, not extending beyond limits of cymbium. Female genitalia with two openings or excavations at anterior end of sclerotized sheet.......................5
   Cariniform process extending one-half the length of the tibia of the male palpi or if extending full length, conductor enlarged and extending beyond
limits of cymbium. Female genitalia with one median opening at the posterior border. 4

4. Cariniform process extending one-half or less the length of the tibia of the male palpus. Conductor normal. Transverse connecting canals not visible under sclerotized sheet of the female genitalia.

..............................................................EXLINE GROUP
Cariniform process extending almost the full length of the tibia of the male palpus. Conductor enlarged and extending beyond limits of cymbium. Transverse connecting canals visible under sclerotized sheet of the female genitalia

.............................................................RETICULATUS GROUP
5. Patellar process of male thumb-like, as long as width of patella. Stabilizing pits absent.

..............................................................SEPTATUS GROUP
Patellar process of male stout, not thumb-like and shorter than the width of patella. Stabilizing pits present..........................MOROSUS GROUP
PART V KEY TO THE OREGON SPECIES OF
THE GENUS CYBARUS

1. Three pair of spines on Tibia I. ..................2
Two pair of spines on Tibia I. (Only males known)
..........................................................tuberculatus n. sp.

2. AME's small, less than two-thirds the size of an
ALE. Patellar process of male projecting laterally (except in C. scopulatus Ch. and Ivie which
bears a scopula beneath Tibia I). Female genitalia
with two excavations or if one, either very small
and more or less quadrate or very large and longer
than wide.....................................................3
AME's large, at least seven-eights the size of an
ALE. Patellar process of male projecting forward.
Female genitalia with a single, large, median ex-
cavation, wider than long..................signifer Simon

3. Males. (No males known for conservans Ch. and
Ivie, janus Ch. and Ivie, nor constrictus Ch. and
Ivie.)............................................................4
Females..........................................................12

4. Dense scopula ventrally on Tibia I
..........................................................scopulatus Ch. and Ivie
Dense scopula absent on Tibia I......................5

5. Patellar process thumb-like; as long as width of
patella..........................................................6
Patellar process stout, not thumb-like; much shorter than width of patella.........................7

6. Patellar process extending ectally at right angles to patella..................septatus Ch. and Ivie
Patellar process extending antero-ectally at a 40°-50° angle to the patella.............simplex n. sp.

7. Cariniform process extending almost the entire length of the tibia of the palpus...............8
Cariniform process extending one-third or less the length of the tibia of the palpus

........................................exlinae Ch. and Ivie

8. Palpal organ much wider than cymbium. Conductor very large, as wide or wider than the patella and process combined..............reticulatus Simon
Palpal organ as wide as cymbium or slightly smaller. Conductor normal, much more narrower than the patella and process combined.................9

9. Caudal process of conductor straight and acuminate

.........................................................10
Caudal process of conductor not straight and acuminate..............................................11

10. Caudal process of conductor pointing ectally, see figure 27..................eutypus Ch. and Ivie
Caudal process of conductor pointing postero-ectally, see figure 26...................cascadium n. sp.
11. Caudal process of conductor more or less truncate distally, see figure 28. morosus Simon
Caudal process of conductor short, curved, and spur-like distally, see figure 29

........................................ multnoma Ch. and Ivie

12. External genitalia with two excavations or without a single arched fold anterior of the excavations..17
External genitalia with a single median excavation along the posterior border or with a single arched fold anterior of the excavations.......................13

13. Median excavation small, sub-quadrate.............14
Median excavation large, extending almost the length of the sclerotized sheet....................16

14. Connecting canals visible as two or four transverse bars, the anterior canals often "L" or "U" shaped. See figure 17..............reticulatus Simon
Transverse connecting canals not visible.............15

15. Two spermathecae visible as darkened areas. Do not mistake darkened areas at openings of connecting canals for spermathecae, see figure 18

........................................ exlineae Ch. and Ivie
Three spermathecae visible as darkened areas. Do not mistake darkened areas at openings of connecting canals for spermathecae, see figure 19

........................................ scopulatus Ch. and Ivie
16. Openings of connecting canals under anterior arched fold, see figure 20..................simplex n.sp. Openings of connecting canals posterior to anterior arched fold. See figure 21

.................................septatus Ch. and Ivie

17. Excavations large, each at least one-third the width of the sclerotized sheet and transversely elongate.................................18

Excavations small, each less than one-fifth the width of the sclerotized sheet and circular in shape or more or less covered by the sclerotized sheet.................................20

18. Excavations about one-half as wide as long. Sclerotized sheet forming an edge over the anterior portion of the excavation.................19

Excavations about two-thirds as wide as long. Sclerotized sheet narrow anteriorally and not extending over excavation. See figure 9

.................................cascadius n. sp.

19. Calvus plate constricted slightly between excavations. See figure 10.................eutypus Ch. and Ivie Calvus plate not constricted between excavations. See figure 11.................janus Ch. and Ivie

20. Connecting canal openings circular and facing ventrally or emptying into a circular atria...........21

Connecting canal openings not circular, facing
posteriorally. See figures 13 and 14

\textit{multnoma} Ch. and Ivie


Connecting canal openings arise on surface of sclerotized plate.

\textit{conservans} Ch. and Ivie

22. Connecting canal openings widely separated, at least three times the diameter of the opening.

See figure 15. \textit{constrictus} Ch. and Ivie

Connecting canal openings close together, separated by slightly more than the diameter of the opening.
PART VI. GROUP AND SPECIFIC DESCRIPTIONS OF OREGON SPECIES OF THE GENUS CYBAEUS

Female specimens of all known Oregon Cybaeus except *C. constrictus* Ch. and Ivie were studied. The genitalia were dissected from all except the above species, *C. janus* Ch. and Ivie, *C. conservans* Ch. and Ivie, and *C. septatus* Ch. and Ivie. The known males for all species except *C. septatus* Ch. and Ivie were studied.

A. SIGNIFER GROUP

The Signifer group consists of a single species, *C. signifer* Simon. The group is distinguished by the following characters. Dusky markings on carapace and annulations on legs usually present. AME's nearly as large as the ALE's. Chelicerae slightly geniculate in both the males and females and with 3 or 4 teeth and 3 or 4 denticles on the hind margins. Tibia I with three pair of spines ventrally. Tibial cariniform process of male palpi extends almost entire length of tibia. Conductor of male palpi normal, not extending beyond the limits of the cymbium. Patellar process prominent, much smaller distally. Female genitalia with stabilizing pits present, excavation single and median. Three pair of spermathecae are present, the tertiary spermatheca is
separated from the connecting canal by a short duct. The size ranges from 7.2 mm. to 13.2 mm. and averages 8.08 mm. in the males and 10.40 mm. in the females.

**Cybaeus signifer** Simon

Figs. 4, 16, 24, 30, 49, 50

**Cybaeus signifer** Simon, Eugene. Descriptions de quelques espèces nouvelles de la famille des Agelenidae. CR. Société Entomologique de Belgique 30:56. 1886.


**Color:** Carapace dark reddish brown, very dark in many species, becoming darker anteriorly and with dusky reticulations. Mouthparts darker reddish brown than anterior portion of carapace. Legs yellowish brown with dusky rings which fade slightly dorsally. Abdomen with typical color pattern but darker than usual.

**Structure:** Typical for genus. Carapace slightly less convex than usual. Chelicerae slightly geniculate in both males and females. Hind margin of chelicera with 3 or 4 teeth and 3 or 4 denticles. AME's slightly smaller than ALE's. Clypeus more than one and one-half times the diameter of an ALE.

**Male Genitalia:** Palpi typical of genus. Apical portion of cymbium long and slender. Patella about as long as tibia. Patellar process blunt and stout, except for a finger-like projection from the mesal portion of the process. Six or eight small, black, conical teeth are present on the dorsal portion of the finger-like process. Dorsally, on the main patellar process, there are 30 to 50 small, black, conical teeth in a cluster. The tibia is produced meso-distally to a dull point. The ecto-ventral surface of the tibia bears a cariniform process about two-thirds as long as the tibia. The caudal process of the conductor is simple and extends
mesally in a slight arch across the face of the palpal organ.

**Female Genitalia:** The sclerotized sheet is slightly corrugated anteriorally and has a stabilizing pit just anterior of each primary spermatheca. The posterio-median half of the sclerotized sheet is excavated to form the calvus plate which is bounded anteriorally by an overhanging lip in the form of a transverse arch. The connecting canals open at the lateral corners of the transverse arch.

Internally the genitalia are moderately sclerotized. The connecting canal extends from the opening at the lateral corner of the transverse arch, mesally and then anteriorally to a "Y" shaped junction which leads, by way of a short connecting canal, to the pear-shaped tertiary spermatheca. A connecting canal extends from the "Y" junction ectally and then turns mesally and enlarges, forming the secondary spermatheca. The secondary spermatheca is swollen in the middle, tapered at both ends, and is slightly smaller than the primary spermatheca. It lacks any evidence of specialized areas as is found on most secondary spermatheca. A short connecting canal unites the secondary spermatheca mesally with the primary spermatheca. The primary spermatheca is elongate, swollen distally, and lies at right angles,
or slightly less, to the median line of the body. The fertilization duct arises at the posterior-mesal edge of the spermatheca and extends posteriorally, converges slightly on the median line and empties into the vagina.

**Length:**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>8.08 mm.</td>
<td>10.40 mm.</td>
</tr>
<tr>
<td>Range</td>
<td>7.2-9.3 mm.</td>
<td>8.8-13.2 mm.</td>
</tr>
<tr>
<td>Number</td>
<td>11</td>
<td>10</td>
</tr>
</tbody>
</table>

**Distribution:** In Oregon along the Coast Range from Forest Grove, Corvallis to Grants Pass. This species is also known as far south in the Coast Range as Pacific Grove, California and is known in both the Coast Range and the Cascade Range in Washington and British Columbia. One specimen was recorded from "Alaska."

**Remarks:** This species is readily separated from all other Oregon species by the large size of the AME's which are almost as large as the ASE's. Also the chelicerae are not as geniculate as is typical for the genus. The species is quite uncommon in Oregon, only three males having been taken during two years of collecting.

**B. RETICULATUS GROUP**

The Reticulatus group consists of a single species, *C. reticulatus* Simon. The group is distinguished by the
following characters. Dusky markings, with few exceptions, on carapace, and annulations on legs. AME's are much smaller than the ALE's. Chelicerae of female strongly geniculate, moderately so in the male. Hind margin of chelicera with 4 or 5 teeth and 4 or 5 denticles. Tibia I with three pair of spines ventrally. Tibial cariniform process of male palpus extends almost the entire length of the tibia. Conductor of male palpus much enlarged, extending beyond the lateral limits of the cymbium. Patellar process prominent, much smaller distally. Female genitalia with stabilizing pits present, excavation single, median, small, subquadrate, and extending from the epigastric furrow anteriorly. Openings of the connecting canals contiguous. Three pair of spermathecae are present, the tertiary spermatheca arises from the posterior portion of the connecting canal and is not separated from it by a short duct. The size ranges from 4.2 mm. to 11.5 mm. and averages 7.60 mm. for the males and 7.93 mm. for the females.

*Cybaeus reticulatus* Simon

Figs. 5, 17, 31, 32, 47, 48.


**Color:** Carapace usually reddish brown anteriorally, becoming lighter posteriorally. Mouthparts usually darker than anterior portion of carapace. Legs light as posterior portion. Carapace with dusky reticulations and legs with dusky annulations. Abdomen with typical color pattern. A few specimens have been studied which lacked any dusky markings on the carapace or legs and on which the color pattern of the abdomen was very faint or absent.

**Structure:** Typical for genus. Chelicera with 4 or 5 teeth and 4 or 5 denticles on the hind margin, occasionally with 3 teeth or 3 denticles. AME's slightly
more than one-half the diameter of an ALE. Clypeus slightly less than one and one-half times the diameter of an ALE.

**Male Genitalia:** Palpi of male large. Cymbium more or less flattened dorso-ventrally and shortened apically. Patella about two-thirds as long as tibia, produced ectally to form a short triangulate process which bears 30 to 35 small, black, conical teeth dorsally. Tibia produced meso-distally to a dull point. A stout carini-form process is borne ecto-ventrally for the entire length of the tibia and extends a short distance beyond the tibia in the form of a broad blade. The gutter-like ectal portion of conductor much broader than usual, extending beyond the ectal limits of the cymbium. Caudal process of conductor small and terminated by a scoop-shaped point as illustrated in figures 31 and 32.

**Female Genitalia:** The sclerotized sheet bears a pair of stabilizing pits anterio-laterally and a posterio-median rectangular excavation. A calvus plate lines the bottom of the excavation posteriorally to the epigastric furrow. Connecting canals open anteriorly in the excavation and are fused mesally at the opening. Anterior and ventral edges of the openings are thickened continuously, forming an apparent single opening which may be
straight, arched, or undulated anteriorly. Visible under the thinly sclerotized sheet in untreated specimens are the primary spermathecae and two pair of transverse connecting canals, the anterior one usually "L" or "U" shaped but occasionally in the shape of a transverse bar as is the posterior connecting canal. The internal genitalia are quite variable as to the position of the long connecting canals which are often displaced to one side or another. The most typical pattern is illustrated by figure 5. The connecting canal arises posteriorally, extends anteriorally the length of the genitalia and curves ectally where a blind pear-shaped pouch opens into the posterior portion of the canal. This is probably homologous with the tertiary spermatheca of the other Cybaeus. The connecting canal extends posteriorally a short distance, curves mesally and anteriorally to the anterior end of the genitalia, turns and follows the canal back to the mesal area where it curves dorsally and enlarges to form the secondary spermatheca. This spermatheca is elongate, tapered at both ends, and lies slightly convergent posteriorally on the median line. It contains a darkened globular mass in the lumen at the posterio-mesal area. Posteriorally the secondary spermatheca is constricted moderately and empties into the globular primary spermatheca. The fertilization duct arises at the posterio-mesal edge of the primary
spermatheca and extends posteriorally to the vagina.

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<th>Length:</th>
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</thead>
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<tr>
<td>Average</td>
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<td>7.931 mm.</td>
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<tr>
<td>Range</td>
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<td>4.2-11.5 mm.</td>
</tr>
<tr>
<td>Number</td>
<td>31</td>
<td>101</td>
</tr>
</tbody>
</table>

**Distribution:** In Oregon the author has collected this species from the coast eastward to and including, the west slope of the Cascade Range and from the Columbia River south to Blue Pool Forest Camp in the Willamette National Forest. A single specimen was collected by Dr. M. H. Hatch at Baker, Oregon. R. V. Chamberlin and W. Ivie (2, p. 18) list this species as being found in "California." It is known throughout Western Washington and along the coast to Alaska and Popof Island in the Aleutian Islands (1, p. 478). The variety *C. reticulatus*tius Ch. and Ivie is reported from Wisconsin by R. V. Chamberlin and W. Ivie, (2, p. 19).

**Remarks:** This is the most common species found in Western Oregon north of Eugene. It is easily identified by the large palpal organ of the male and by the four lengths of connecting canal visible under the sclerotized sheet. The position of these canals vary.
Cybaeus reticulatus tious Chamberlin and Ivie

Graph I


In the course of study of the genus Cybaeus, one hundred-thirty-eight specimens of C. reticulatus Simon have been brought together from various collections by the writer. A study of these specimens places doubt on the validity of the variety C. reticulatus tious Ch. and Ivie. Since the differences stated in the original description were one of size of carapace and position of the palpal organ, these two characters were given the most attention.

The position of the palpal organs were studied to determine if the organs were compact in the variety C. reticulatus tious Ch. and Ivie and expanded in C. r. reticulatus Simon. For males with a carapace length of 3.4 mm. or less, 8 specimens had the palpal organ expanded and 3 had the structure compact; for males with a carapace length of 9.5 mm. or more, 11 specimens had the palpal organ expanded and 9 had the structure compact.

The length of the carapace was measured from 139 specimens of C. reticulatus Simon. These data are
plotted in Graph I. A study of the graph indicates that there are not sufficient differences to establish the two varieties. Furthermore, the morphological structures of \textit{C. r. tius} Ch. and Ivie and \textit{C. r. reticulatus} Simon are identical. Internally the female genitalia of the two varieties are the same. The coloration varies, although the integument of \textit{C. r. tius} Ch. and Ivie is generally lighter than that of \textit{C. r. reticulatus} Simon. However, this character is not constant. Specimens of both varieties have been collected in the same locality at the same time, so there is no apparent geographic isolation.

\textbf{C. \textit{MOROSUS} GROUP}

The Morosus group is the largest group, containing seven species, of which three are known only from the females. The species are \textit{C. conservans} Ch. and Ivie, \textit{C. multnoma} Ch. and Ivie, \textit{C. constrictus} Ch. and Ivie, \textit{C. morosus} Simon, \textit{C. eutypus} Ch. and Ivie, \textit{C. janus} Ch. and Ivie and \textit{C. cascadius} n. sp. This group is distinguished by the following characters. Dusky markings on carapace and annulations on legs present or absent. AME's much smaller than ALE's. Chelicerae in females strongly geniculate, moderately so in the male. Hind margin of chelicera with 3 to 6 teeth and 3 to 5 denticles, usually 4 or 5 teeth and 4 or 5 denticles.
Tibia I with three pair of spines ventrally. Tibial carniform process of male palpus extends almost entire length of tibia. Conductor of male palpus normal, not extending beyond limits of cymbium. Patellar process prominent, much smaller distally. Female genitalia with stabilizing pits present. Excavations paired, either large or absent, in which case the connecting canals open on the surface of the sclerotized sheet and not in an excavation. Openings of the connecting canal widely separated or arising from under the calvous plate.

Three pair of spermathecae are present, the tertiary spermatheca arises in line with the connecting canal and is connected by the connecting canal at both ends. The size ranges from 5 mm. to 11.5 mm. and averages 7.01 mm. in the females, and 7.75 mm. in the males. These averages do not indicate a true average because the males for three species are unknown.

Cybaeus conservans Chamberlin and Ivie

Fig. 15.

**Color:** Carapace and chelicerae reddish brown. Legs, sternum, endites, and labium slightly lighter reddish brown. No markings. Abdomen with typical color pattern.

**Structure:** Typical for genus. Chelicera with 4 or 5 teeth and 3 to 5 denticles on hind margin. AME's slightly more than one-half the size of ALE's. Clypeus slightly larger than the diameter of an ALE.

**Female Genitalia:** A pair of stabilizing pits are present at the posterior portion of the sclerotized sheet. The openings of the connecting canals are small, circular, and separated by about four times their own diameter. A light colored, triangulate, calvus plate connects the openings and extends posteriorally to the epigastric furrow. The plate is broadly truncate posteriorally. The junction of the calvus plate with the sclerotized sheet between the openings of the connecting canals forms a straight transverse line.

No specimens were available for dissection but paratypes were seen.

**Length:** Both paratypes were females, 7 mm. long. The female holotype was reportedly 8 mm. long.

**Distribution:** Known only from Ashland and Roseburg, Oregon.
Remarks: The males of this species are unknown. The females are very similar to some specimens of C. multnoma Ch. and Ivie, but can be differentiated by the straight transverse line between the connecting canal openings and by the broad calvus plate. No specimens of this species were collected by the author.

Cybaeus multnoma Chamberlin and Ivie

Figs. 3, 13, 14, 29, 45, 46.


Color: Carapace moderately reddish brown anteriorly, becoming lighter posteriorally. Mouthparts slightly darker than anterior portion of carapace. Legs light as posterior portion. Carapace with dusky reticulations and legs with faint dusky annulations above, becoming darker below. Abdomen with typical color pattern.
Structure: Typical for genus. Chelicera with 4 or 5 teeth and 5 denticles on hind margin. AME's slightly more than one-half the diameter of an ALE. Clypeus slightly more than the diameter of an ALE.

Male Genitalia: Palpi of male moderately large. Apical portion of cymbium short and stout. Patella slightly shorter than the tibia and with a prominent process ecto-distally about two-thirds as long as the width of the patella. It extends antero-distally at about a 40° angle, and bears, dorsally, 30 to 40 small, black, conical teeth scattered over the entire surface but concentrating more or less distally. The tibia bears a hump dorsally and is produced meso-distally into a short, dull point. A stout cariniform process extends the length of the tibia and is borne ecto-ventrally. Caudal process of conductor moderately large and terminating in a slightly curved point as illustrated in figure 29.

Female Genitalia: The sclerotized sheet bears stabilizing pits antero-laterally and two circular, lateral excavations, more or less covered by an extension of the sheet. A calvus plate arises between the excavations and converges posteriorally at the epigastric furrow as illustrated in figures 13 and 14.
Internally the genitalia is typical of the Morosus group. Connecting canal openings widely separated. The connecting canal extends posteriorally from the opening a very short distance, curves mesally to the median line, and then outward to connect with the globose tertiary spermatheca. A second connecting canal arises ectally on the tertiary spermatheca, curves posterio-mesally, and abruptly enlarges into the globose secondary spermatheca which lacks the specialized or darkened areas usually present. A short connecting canal unites the secondary spermatheca posteriorally with the globose primary spermatheca. At the junction of the connecting canal and the primary spermatheca a slender fertilization duct arises and extends posteriorly to the vagina.

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<thead>
<tr>
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<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
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<td>6.79 mm.</td>
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<tr>
<td>Range</td>
<td>5.9-8.1 mm.</td>
<td>5.3-8.8 mm.</td>
</tr>
<tr>
<td>Number</td>
<td>4</td>
<td>20</td>
</tr>
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</table>

**Distribution:** Specimens have been collected in Oregon on the west side of the Cascade Range from Cascadia, south to the Blue Pool Forest Camp in the Willamette National Forest, at Coquille on the coast, at Roseburg, and at Cave Junction. Only one specimen is known from Northern California, 9 miles north of Crescent City.
Remarks: The female holotype of *C. multnoma* Ch. and Ivie and 22 other specimens of this species were studied. The specimens showed considerable variation in the female genitalia as illustrated in figures 13 and 14. The males however, showed no variation. The similarity of some specimens of *C. multnoma* Ch. and Ivie to *C. conservans* is very close.

*Cybaeus constrictus* Chamberlin and Ivie

*Cybaeus constrictus* Chamberlin, Ralph Vary, and Ivie Wilton


The following is taken from the original description.

"Color: Pale. Carapace orange, slightly darker on front of head, without markings. Chelicerae reddish brown. Labium and endites light reddish brown, with white tips. Sternum light orange. Legs orange yellow, darker distally, without rings. Abdomen gray above, with the typical pattern of light gray spots (e.g., as in *morosus*); venter pale gray. "Structure close to that of *C. morosus* Simon. Chelicerae with three teeth and four denticles on hind margin of fang groove. Tibia I and II each with three pairs of spines on the underside. Epigynum resembles that of *morosus*, but has much smaller openings."

Length: Only female holotype known. 6.5 mm.

Distribution: Type locality, Tillamook Co., Oregon.
Remarks: The holotype was not available for study and no other specimens are known. Dr. Gertsch studied the holotype and states, through correspondence, "the openings are small and very close together, separated by scarcely the diameter of the black circular tube beneath the integument."

**Cybaeus morosus** Simon

Figs. 2, 12, 28, 43, 44.

**Cybaeus morosus** Simon, Eugene. Descriptions de quelques espèces nouvelles de la famille des Agelenidae. CR. Société Entomologique de Belgique 30:57. 1886.


**Cybaeus morosus** Emerton, James Henry. New Spiders from Canada and the adjoining States. Canadian Entomologist 55:240-242, fig. 5c. (†), (nec. figs. 5a, b.). 1923.

Cybaeus morosus Chamberlin, Ralph Vary and Ivie, Wilton.


Color: Quite variable. Carapace light yellowish brown to dark reddish brown, with or without dark markings. Mouthparts slightly darker than carapace. Legs as dark as posterior portion of carapace, with very faint annulations or none. Abdomen with typical color pattern which may be dark or light.

Structure: Typical for genus. Chelicera with 4 or 5 teeth and 4 or 5 denticles on hind margin. Occasionally 3 teeth present with 4 or 5 denticles. AME's about two-thirds the diameter of an ALE.

Male Genitalia: Palpi of moderate size. Cymbium very short apically. Patellar process ectad, at right angles to the patella distally and tapers gradually to the base of the patella. Process bears 25 to 35 small, black, conical teeth dorso-distally. Tibia produced into a short, dull point meso-distally. Ecto-ventrally, the
tibia bears a very prominent cariniform process which extends almost the length of the tibia. Caudal process of conductor cylindrical at base with ventral side of the distal part of the cylinder removed as illustrated in figure 28.

**Female Genitalia:** Two circular atria are present and each has a lip extending over the lateral and anterior borders formed by the sclerotized sheet. The stabilizing pits lie anterio-laterally of the atria. The connecting canals open at the anterio-mesal edge of the atria. A calvus plate arises between the atria and converges posteriorally at the epigastric furrow.

Internally the genitalia are similar to *C. multnoma* Ch. and Ivie. However, there are a number of minor differences. The connecting canal openings are closer together and the canal from the opening to the tertiary spermatheca is shorter. The secondary spermatheca is elongate, swollen mesally, and contains a minute black, globular mass at the posterio-mesal area of the lumen. The fertilization duct is very slender and extends directly posteriorly to the vagina.

<table>
<thead>
<tr>
<th></th>
<th><strong>Male</strong></th>
<th></th>
<th><strong>Female</strong></th>
</tr>
</thead>
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<tr>
<td>Length</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Average</td>
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<td>8.88 mm.</td>
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<tr>
<td>Range</td>
<td>7.0-7.8 mm.</td>
<td></td>
<td>6.9-10.3 mm.</td>
</tr>
<tr>
<td>Number</td>
<td>4</td>
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<td>15</td>
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</table>
Distribution: Distributed along the Coast Range in Oregon from Roseburg north to the Columbia River. It is also known from the coastal area in Washington north to southern Alaska at Haines.

Remarks: The large circular atria of the female genitalia of *C. morosus* Simon is distinctive for this species. Other species of females either have a median opening or smaller and more or less concealed openings. The males can be easily separated by the distinctive caudal process of the conductor as illustrated in figure 28.

*Cybaeus eutypus* Chamberlin and Ivie

Figs. 1, 10, 27, 41, 42.

*Cybaeus eutypus* Chamberlin, Ralph Vary and Ivie, Wilton. 


Color: Variable. Carapace light yellowish brown to reddish brown, with or without dark reticulations. Mouthparts slightly darker than carapace. Legs as dark as posterior portion of carapace, usually without annulations but when present, faintly visible below and absent above. Abdomen with typical color pattern.

Structure: Typical for genus. Chelicera with 4 to 6 teeth and 4 to 6 denticles. AME's slightly more than one-half the diameter of an ALE. Clypeus one and one-quarter times the diameter of an ALE.

Male Genitalia: Palpi of male moderately stout. Apical portion of cymbium short and stout. Patella slightly shorter than tibia, produced slightly ecto-distally and bearing 25 to 30 small, black, conical teeth on the process. Tibia with a hump dorsally and produced meso-distally into a short dull point. A stout cariniform process extending the length of the tibia is borne ecto-ventrally. Caudal process of conductor similar to a thick ovate plate with an acuminate process extending ectally across the face of the plate.

Female Genitalia: The sclerotized sheet is corrugated transversely to the lateral edges of the transversely ovate excavations. The excavations are about twice as wide as long, open behind, and bordered
anteriorally and mesally with an overhanging rim. They are separated medially by an arrowhead-shaped calvus plate which is truncate posteriorly. The connecting canals open mesally in the excavations and are hidden by the calvus plate. Internally the genitalia are typical of the Morosus group. The connecting canal extends from the opening, mesally to the median line and turns anteriorally to the globose tertiary spermatheca. A connecting canal extends from the ectal portion of the spermatheca posteriorally where it gradually enlarges to form an elongate secondary spermatheca. This is swollen posteriorally and bears internally a minute, darkened, circular disk at the posterio-mesal area. A short connecting canal connects the secondary spermatheca to the globose primary spermatheca. A slender fertilization duct arises at the junction of the connecting canal and the primary spermatheca and converges posteriorally.

<table>
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<th>Female</th>
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<td>Average</td>
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<td>8.27 mm.</td>
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<tr>
<td>Range</td>
<td>6.5-8.9 mm.</td>
<td>6.6-9.8 mm.</td>
</tr>
<tr>
<td>Number</td>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>

Distribution: In Oregon, specimens are known from Roseburg north along the Coast Range and the Cascade Range to the Columbia River. This species is also known in Western Washington.
Remarks: This species is closely related to *Cybaeus* cascadus n. sp. and *Cybaeus* janus Chamberlin and Ivie. The latter species is known only from the female. *Cybaeus* eutypus Chamberlin and Ivie differs from *Cybaeus* janus Chamberlin and Ivie by its greater size. Also, the calvus plate, which divides the excavations, is constricted anteriorly whereas in *Cybaeus* janus Chamberlin and Ivie it is not. *Cybaeus* cascadus n. sp. differs in having much wider excavations and they are not bordered anteriorly by such a definite lip. The males can be separated by differences in the caudal process of the conductor as illustrated.

*Cybaeus janus* Chamberlin and Ivie

Fig. 11

*Cybaeus janus* Chamberlin, Ralph Vary, and Ivie, Wilton.


Color: Carapace yellowish posteriorally, blending into amber anteriorally. Mouthparts slightly darker amber than the anterior part of the carapace. Faint dusky markings on the carapace and side of head. Sternum and legs light yellow and without dusky markings. Abdomen with typical color pattern but lighter than usual.
**Structure:** Typical for genus. Chelicera with 5 or 6 teeth and 4 denticles. The basal tooth on the hind margin is very minute. AME's slightly more than one-half the diameter of an ASE.

**Length:** Female holotype - 5.6 mm.  
Female paratype - 5.0 mm.

**Distribution:** Comstock, Oregon, type locality.

**Remarks:** Two specimens of this species are known from Oregon. They are very similar to *C. eutypus* Ch. and Ivie and the internal structure is undoubtedly the same. They can be separated by differences explained in the remarks under *C. eutypus* Ch. and Ivie.

**Cybaeus cascadus** n. sp.  
Figs. 1, 9, 23, 26, 39, 40.

**Color:** Carapace reddish brown, becoming darker anteriorly. Chelicerae slightly darker than anterior portion of carapace. Endites and labium yellowish brown. Sternum slightly darker than endites. Legs yellowish to reddish brown, with very faint annulations. Abdomen with typical color pattern.

**Structure:** Typical for genus. Chelicera with 4 or usually 5 teeth and 5 denticles on the lower margin. AME's slightly less than three-quarters the diameter of
an ALE. Clypeus about one and one-third the diameter of an ALE.

Male Genitalia: Palpi of male moderately stout. Apical portion of cymbium short. Patella slightly shorter than tibia, produced slightly ecto-distally and bearing 30 to 35 small, black, conical teeth distally on the process. Tibia with a hump dorsally and produced meso-distally to a short dull point. A stout cariniform process extending the length of the tibia is borne ecto-ventrally. Caudal process of conductor stout, composed of a more or less rectangular base with an acuminate process extending posterio-ectally across the face of the base.

Female Genitalia: The female genitalia are quite unusual. They are much larger than normal and most of the external area is membranous. The sclerotized sheet is very narrow along the posterior, anterior, and lateral edges. It is corrugated transversely, thinly covered with setae, and bears laterally a pair of strongly sclerotized stabilizing pits. Two large ovate excavations two-thirds as long as wide lie transversely and are divided by a wide membranous calvus plate. The calvus plate is arrowhead-shaped and truncate posteriorly. The connecting canals open mesally in the
excavations and are hidden by the calvus plate. Internally the genitalia is identical to *C. eutypus* Ch. and Ivie and has been discussed under that species. The same drawing of the internal genitalia is used for both species.

<table>
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<td>17</td>
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</tbody>
</table>

Distribution: All specimens collected were from an area one mile west of Cascadia and Tombstone Prairie which is about 18 miles to the east on the Santiam highway in Oregon.

Remarks: The differences between this species and *C. eutypus* Ch. and Ivie have been discussed under the latter species.

D. EXLINAE GROUP

The Exlinae group consists of two species, *C. exlinae* Ch. and Ivie, and *C. scopulatus* Ch. and Ivie. The following characters distinguish this group.

Carapace with dusky markings and dusky annulations present on legs. AME's much smaller than ALE's. Chelicerae of females strongly geniculate, moderately so in males. Hind margin of chelicera with 3 to 5 teeth and 3 to 5 denticles. Tibia I with three pair of spines ventrally. Tibial cariniform process of male palpus half as long as tibia
or much less. Conductor of male palpus normal, not extending beyond limits of cymbium. Patellar process prominent or not and much smaller distally. External female genitalia with stabilizing pits present. Excavation single, small, subquadrate, and extends, from the epigastric furrow, anteriorly. Openings of connecting canals contiguous. Three pair of spermathecae are present, the tertiary spermatheca is more or less pear-shaped and appears to arise at the connecting canal opening on the sclerotized sheet. A small connecting canal arises ventrally on the tertiary spermatheca and extends to the secondary spermatheca. The size ranges from 5.2 mm. to 9.0 mm. and averages 5.65 mm. in the males and 7.19 mm. in the females.

*Cybaeus scopulatus* Chamberlin and Ivie

Figs. 6, 19, 35, 36, 53, 54.

*Cybaeus scopulatus* Chamberlin, Ralph Vary, and Ivie,


Bulletin of the University of Utah 32(13):13-14, figs. 39, 40. 1942.

Color: Carapace dark reddish brown, becoming darker anteriorally and with dusky reticulations. Mouthparts slightly darker than anterior portion of carapace. Legs yellowish brown and ringed with dusky markings which
become faint and fade out dorsally. Ventral surface of Tibia I of male dark reddish brown. Abdomen with typical color pattern.

**Structure:** Typical for genus. Chelicerae strongly geniculate in the female, moderately so in the male; hind margin with 3 teeth and 3 denticles or 4 teeth and 3 or 4 denticles. AME's about two-thirds diameter of an ALE. Clypeus slightly larger than diameter of an ALE. Male bears a dense scopula ventrally on Tibia I. This is absent on all known species of *Cybaeus*.

**Male Genitalia:** Palpi of male moderately long and slender. Patella longer than tibia and with patellar process extending anteriorly from ectal distal edge of patella. Process short, stout, and bears 10 to 15 short, conical teeth dorsally. Tibia produced to a dull point meso-distally and with a broad flat apophysis ectally. Caudal process of conductor small and simple, extending at right angles across face of organ.

**Female Genitalia:** The female genitalia of this species is very similar in general structure, externally and internally, to that of *C. exelinae* Ch. and Ivie. Externally the structure is identical except for the visibility of internal organs. Internally the tertiary spermatheca is more slender and club-like. The secondary spermatheca is larger but still elongate and tapered at
both ends. It forms a "C" curve over the basal half of the tertiary spermatheca. At the posterior mesal area of the secondary spermatheca there is an indentation in the wall with a few ducts or cells penetrating the wall. The primary spermatheca is subovate, tapered more or less mesally, and lies at about a seventy degree angle to the median line. The fertilization ducts are moderately convergent posteriorally.

<table>
<thead>
<tr>
<th>Length:</th>
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<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>5.25 mm.</td>
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</tr>
<tr>
<td>Range</td>
<td>5.2-5.3 mm.</td>
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</tr>
<tr>
<td>Number</td>
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<td>17</td>
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</tbody>
</table>

Distribution: Santiam Pass area and 10 miles south of Parkdale, Oregon in the Mount Hood area. The type specimen is from Perham Creek, Columbia River Gorge, Oregon.

Remarks: The dense scopula present ventrally on Tibia I of the male is absent in the female and the penultimate instar of the male. The differences between this species and *Cybaeus exlinae* Chamberlin and Ivie will be discussed in the remarks under that species.

*Cybaeus exlinae* Chamberlin and Ivie

Figs. 7, 18, 33, 34.


New Spiders of the Family Agelenidae from Western

**Color:** Carapace dark reddish brown, becoming darker anteriorally and with dusky reticulations. Mouthparts slightly darker than anterior portion of carapace. Legs yellowish brown and ringed with dusky markings which become faint and fade out dorsally. Abdomen with typical color pattern.

**Structure:** Typical for genus. Chelicerae strongly geniculate in the female, moderately so in the male; hind margin with 4 or 5 teeth and 4 or 5 denticles. AME's about two-thirds diameter of an ALE. Clypeus slightly larger than diameter of an ALE.

**Male Genitalia:** Palpi of male very slender and long. Patella and tibia equal in size. Process of patella very small, with 14 to 16 small black conical teeth dorsally. Tibia produced to a dull point meso-distally and with a broad flat apophysis ectally. Palpal organ typical of genus but cymbium smaller than usual. Caudal process of conductor is hook-shaped and extends ventrally.
Female Genitalia: The sclerotized sheet bears stabilizing pits anteriorly and a small median opening on the posterior half. The junction of the open ends of the two connecting canals form the median opening. The connecting canals are joined mesally at their open ends and the anterior and ventral edges of the openings are thickened continuously, forming a thickened transverse strip over the two openings. From each lateral edge of the transverse strip of the opening, extends a sclerotized line separating the calvus trapizoidal plate which is widest anteriorly and extends to the epigastric furrow.

In untreated specimens the spermathecae and parts of the connecting canals are visible. Internally the genitalia are strongly sclerotized. The connecting canal extends anteriorly from the opening a very short distance and opens into a tear-drop shaped, longitudinal tertiary spermatheca. This spermatheca curves slightly ectally at the distal half. A connecting canal arises ventrally in the middle of the spermatheca and curves dorsally and posteriorally where it enlarges slightly to form the secondary spermatheca. This is very slender, elongate, tapered at both ends, and at the posterior mesal area there are, apparently, a few minute ducts or cells penetrating the wall. A short connecting canal extends from the secondary spermatheca to the
posterio-mesal edge of the primary spermatheca. The primary spermatheca is globular and situated ectad to the secondary spermatheca. The fertilization duct arises at the junction of the connecting canal and the primary spermatheca and extends posteriorly and dorsally where it enters the vagina.

<table>
<thead>
<tr>
<th></th>
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<th>Female</th>
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<td>Length:</td>
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<td>8.1 mm.</td>
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<tr>
<td>Average</td>
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<td>7.0-9.0 mm.</td>
</tr>
<tr>
<td>Range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

**Distribution:** All specimens studied were from Langdon Lake in the Blue Mountains at Toll Gate, Oregon. The only other specimens known are from Tamarack, Idaho.

**Remarks:** *C. exlineae* Ch. and Ivie is very similar to *C. bulbosa* Exline, *C. scopulatus* Ch. and Ivie, and the eastern species *C. silicis* Barrows. The internal female genitalia have been studied for all four species. *C. exlineae* Ch. and Ivie differs from *C. bulbosa* Exlineae and *C. silicis* Barrows in having a slender, elongate secondary spermatheca and from *C. scopulatus* Ch. and Ivie in having the secondary spermatheca situated between the primary and tertiary spermatheca. In *C. bulbosa* Exlineae and *C. silicis* Barrows the secondary spermatheca is globose and in *C. scopulatus* Ch. and Ivie the secondary spermatheca overlaps the basal half of the primary spermatheca. The male of *C. bulbosa* Exlineae is unknown.
C. scopulatus Ch. and Ivie bears a scopula ventrally on Tibia I which is absent in C. exlinae Ch. and Ivie. A specimen of a male C. silicis Barrows from Tennessee which was determined by Barrows was identical to a male of C. exlinae Ch. and Ivie from Oregon. However, in the type specimens the tibia was much longer than that of C. exlinae Ch. and Ivie.

E. SEPTATUS GROUP

The Septatus group consists of two species, C. septatus Ch. and Ivie and C. simplex n. sp. The following characters distinguish this group. Carapace and legs without dusky markings. AME's much smaller than the ALE's. Chelicerae of females moderately to strongly geniculate, moderately so in the males. Hind margin of chelicera with 3 to 5 teeth and 3 to 5 denticles. Tibia I with three pair of spines ventrally. Tibial cariniform process of male palpi extends the length of the tibia or nearly so. Conductor of male palpi normal, not extending beyond limits of cymbium. Patellar process very prominent, the same size distally as at base. The female genitalia lacks stabilizing pits. The calvus plate is bordered anteriorally by a transversely arched fold. Openings of connecting canals are separated by a long calvus plate which extends to the arched fold. One fully developed primary spermatheca is present and one very short blind
duct leads off from the connecting canal. This is apparently the degenerate tertiary spermatheca. The size ranges from 3.9 mm. to 6.0 mm. and averages 4.51 mm. in the males and 4.91 in the females.

*Cybaeus simplex* n. sp.

Figs. 8, 20, 22, 38, 55, 56.

**Color:** Carapace yellowish to reddish brown, without markings, and usually darker anteriorally. Mouthparts slightly darker than carapace and legs usually the same color or slightly lighter. Abdomen with typical color pattern but lighter than usual.

**Structure:** Typical for genus. Carapace slightly broader than usual. Chelicera with 4 teeth and 4 denticles or 5 teeth and 3 denticles on hind margin. AME's about five-eighths diameter of ALE's. Clypeus slightly wider than diameter of an ALE.

**Male Genitalia:** Palpi of male typical for genus. Patellar process prominent, thumb-like, and extending outward at a forty-five degree angle. Process bears 20 to 25 minute conical, black teeth distally on dorsal side. Tibia bears a stout cariniform process ector-ventrally. Caudal process of conductor convoluted distally as illustrated in figure 38.
Female Genitalia: The sclerotized sheet bears an anterior transverse fold and lacks stabilizing pits. Posterior to the fold is a shallow glabrous depression. The connecting canal openings are paired and open at the center of, and beneath the transverse fold. Posterior to the openings is the calvus plate which extends posteriorly to the epigastric furrow. The plate is slightly raised in the center for its entire length. It arises at the lateral edges of the openings of the connecting canals, rapidly narrows to about three-fifths the original width and extends posteriorly to the posterior edge of the sclerotized sheet where it widens slightly. The plate is about four times as long as it is wide in the center. The spermathecae are the only internal structures visible through the convex sheet.

Internally the genitalia are simplified greatly. The secondary spermathecae are absent. The connecting canal arises on the anterior half of the convex sheet and extends anteriorly a very short distance, curves dorsally and posteriorly past the opening of the canal and then curves laterally where a short blind duct arises. This is apparently a degenerate tertiary spermatheca. The connecting canal continues mesally and posteriorly where it connects with the spermatheca with no changes in the size of the canal. Just prior to the primary spermatheca on the mesal area of the connecting canal is
a small indentation in the wall of the canal. This arises where the secondary spermatheca should be and is similar to the odd structures found in many of the secondary spermatheca. The spermatheca is ellipsoidal and lies almost transversely. The fertilization duct arises at the posterio-mesal edge of the spermatheca and extends posterio-mesally to the vagina. It is very slender, much more so than in the other species of *Cybaeus* studied.

<table>
<thead>
<tr>
<th></th>
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<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
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<td>4.57 mm.</td>
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<tr>
<td>Range</td>
<td>3.9-5.1 mm.</td>
<td>4.0-5.1 mm.</td>
</tr>
<tr>
<td>Number</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

**Distribution:** Most specimens were taken in the Cascadia, Oregon area. One specimen was taken at Blue Pool Forest Camp in the Willamette National Forest, Oregon.

**Remarks:** This species is similar to *C. septatus* Ch. and Ivie but can be separated by the patellar process of the male which extends at right angles in *C. septatus* Ch. and Ivie and at a 45° angle in *C. simplex* n. sp. The females can be separated by the differences illustrated in figures 20 and 21.

*Cybaeus septatus* Chamberlin and Ivie

*Fig. 21*

*Cybaeus septatus,* Chamberlin, Ralph Vary, and Ivie,

Color: Carapace, mouthparts, sternum, and legs yellowish brown, carapace slightly darker than appendages and sternum. Mouthparts slightly lighter than carapace. In the original description the coloration was described as, "Carapace orange, darker on the front of the head. Chelicerae reddish brown. Labium and endites light reddish brown with pale tips. Sternum yellowish orange. Legs yellowish, without markings." This difference in coloration might be attributed to changes caused by the preservative. Abdomen with usual color pattern but slightly lighter than typical.

Structure: Very similar to C. simplex n. sp. Carapace not so broad. Chelicera with 3 teeth and 5 denticles or 4 teeth and 4 denticles on hind margins. AME's about two-thirds the diameter of ALE's. Clypeus one and one-half times diameter of an ALE.

Male Genitalia: Palpi of male typical for genus. Patellar process prominent, thumb-like, and extending outward at right angles to the patella. In the original description R. V. Chamberlin and W. Ivie (3, p. 12) state, "on the dorso-ectal side (patellar process) of which are 6 or 7 small black conical points." Tibia bears a stout cariniform process ecto-ventrally. Caudal process
of conductor apparently differs from _C. simplex_ n. sp.

**Female Genitalia:** The external genitalia of the female paratype studied appeared to be mostly membranous although the specimen was evidently fully mature. The sclerotized sheet is bordered anteriorly by a transversely arched rim, the edge of which is darkened. Stabilizing pits are absent. The calvus plate posterior of the rim is "T" shaped with the top of the "T" anteriorly. The stalk of the "T" divides the two openings of the connecting canals and tapers slightly from the middle of the stalk to the epigastric furrow. There is a circular depression on either side of the "T" between the stalk and the arms of the "T". The connecting canal openings appear to extend mesally and downward. Unfortunately no material was available for dissection but the internal genitalia will undoubtedly be found to be similar to _C. simplex_ n. sp.

<table>
<thead>
<tr>
<th>Length:</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>4.30 mm.</td>
<td>5.25 mm.</td>
</tr>
<tr>
<td>Range</td>
<td>-</td>
<td>4.5-6.0 mm.</td>
</tr>
<tr>
<td>Number</td>
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<td>2</td>
</tr>
</tbody>
</table>

**Distribution:** One specimen was collected at **Grants Pass, Oregon** by R. V. Chamberlin and W. Ivie. Specimens are also known from Northern California.
Remarks: Similar to *C. simplex* n. sp. and can be separated by characters given in the remarks concerning that species.

**F. TUBERCULATUS GROUP**

The Tuberculatus group consists of one species, *C. tuberculatus* n. sp., which is known only from the holotype. The following characters distinguish this group. Carapace and legs without dusky markings. AME's much smaller than the ASE's. Chelicerae straight, hind margin with three teeth and seven denticles. Tibia I with two pair of spines ventrally. Palpus of male lacking a tibial cariniform process. Patella with two very small processes ectally. Conductor normal, not extending beyond limits of cymbium. The holotype is 3.7 mm. long.

*Cybaeus tuberculatus* n. sp.

**Fig. 25**

Color: Carapace, chelicerae, and sternum light yellow. Labium and endites slightly darker and legs slightly lighter than carapace. Eyes individually ringed with black. Abdomen light gray with white chevrons, the anterior one inverted, followed by four typical chevrons. Venter pale.
Structure: Carapace slightly wider than normal for the genus. Head wide, not as distinctly differentiated from the pars thoracica as in typical Cybaeus. Pars thoracica slants steeply from middle of thoracic furrow to a small indistinct ledge along the posterior border. Clypeus wide as diameter of an ALE. AME's about one-third diameter of an ALE, and their own diameter apart. Chelicerae straight, hind margin with 3 teeth and 6 or 7 denticles.

Legs moderately long, spination reduced on legs I and II. Tibia I and II with two pair of spines ventrally (distal pair missing), Tibia III and IV with three pair of spines ventrally. All metatarsi with two pair of spines ventrally and three spines distally.

Male Genitalia: Male palpi small, femora not modified. Patella with two small leaf-like structures ectally, the smallest placed distally and the most prominent placed one-third the distance from the distal end. Embolus arises near mesal margin and curves distally and ectally where it is received by a curved tuberculated conductor. The embolus is whip-like but distally becomes bifid, apparently by the separation of the pars pendula of the embolus. This bifurcation is not apparent in the other indigenous species of Cybaeus. The female is not known for this species.
Length: Male
Average 3.7 mm.
Range -
Number 1


Remarks: Only the holotype is known for this species. It is very distinct from all *Cybaeus* by the presence of two pair of spines on the ventral surface of Tibia I and II. The only other species which possesses such spination is *C. perditus* Ch. and Ivie. This species is known only from female specimens from Northwestern Washington. *C. tuberculatus* n. sp. may prove to be the male of *C. perditus* Ch. and Ivie.
ANTE. Anterior lateral eye.

AME. Anterior median eye.

*Calvus plate. A glabrous plate arising between the fertilization ducts at the epigastric furrow and extending medially to either the openings of the connecting canals or to the lightly sclerotized sheet covering the female genitalia. It is usually lighter colored than the sclerotized sheet and is often more heavily sclerotized along the lateral edges.

PLE. Posterior lateral eye.

PME. Posterior median eye.

Primary spermatheca. The spermatheca from which the fertilization duct arises.

*Sclerotized sheet. The thinly sclerotized sheet, sparsely covered with setae, which partially or wholly cover the internal genitalia. It is bounded laterally by the book lungs and posteriorly by the epigastric furrow. The anterior boundary lies at the point where the sheet begins to show sclerotization or just anterior of the limits of the internal genitalia. Usually the sheet is well defined in more mature specimens but is almost indistinguishable from the remaining integument in teneral specimens.

*Terms not previously used by authors.
Secondary spermatheca. An intermediate bulbous cavity between the primary and tertiary spermatheca.

*Stabilizing pits. A pair of small, usually transverse pits or strongly sclerotized areas at the anterior or lateral borders of the sclerotized sheet.

*Tertiary spermatheca. The first bulbous cavity between the opening of the connecting canal and the secondary spermatheca.

*Terms not previously used by authors.
PART VIII LITERATURE CITED


Plate I

Fig. 1. Dorsal view of the dissected female genitalia of Cybaeus eutypus Ch. and Ivie and C. cascadius n. sp.
Fig. 2. Dorsal view of the dissected female genitalia of Cybaeus morosus Simon.
Fig. 3. Dorsal view of the dissected female genitalia of Cybaeus multnoma Ch. and Ivie.
Fig. 4. Dorsal view of the dissected female genitalia of Cybaeus signifer Simon with the right primary and secondary spermathecae removed.
Fig. 5. An outline of a dorsal view of the dissected female genitalia of Cybaeus reticulatus Simon.
Plate II

Fig. 6. Dorsal view of the dissected female genitalia of Cybaeus scopulatus Ch. and Ivie.

Fig. 7. Dorsal view of the dissected female genitalia of Cybaeus exlineae Ch. and Ivie.

Fig. 8. Dorsal view of the dissected female genitalia of Cybaeus simplex n. sp.

Fig. 9. Ventral view of the female genitalia of Cybaeus cascadius n. sp.

Fig. 10. Ventral view of the female genitalia of Cybaeus eutypus Ch. and Ivie.

Fig. 11. Ventral view of the female genitalia of a paratype of Cybaeus janus Ch. and Ivie.

Fig. 12. Ventral view of the female genitalia of Cybaeus morosus Simon.
Plate III

Fig. 13. Ventral view of the female genitalia of the holotype of *Cybaeus multnoma* Ch. and Ivie.

Fig. 14. Ventral view of the female genitalia of *Cybaeus multnoma* Ch. and Ivie.

Fig. 15. Ventral view of the female genitalia of a paratype of *Cybaeus conservans* Ch. and Ivie.

Fig. 16. Ventral view of the female genitalia of *Cybaeus signifer* Simon.

Fig. 17. Ventral view of the female genitalia of *Cybaeus reticulatus* Simon.

Fig. 18. Ventral view of the female genitalia of *Cybaeus exlineae* Ch. and Ivie.

Fig. 19. Ventral view of the female genitalia of *Cybaeus scopulatus* Ch. and Ivie.
Plate IV

Fig. 20. Ventral view of the female genitalia of *Cybaeus simplex* n. sp.

Fig. 21. Ventral view of the female genitalia of a paratype of *Cybaeus septatus* Ch. and Ivie.

Fig. 22. Ventral view of the left palpus of a male of *Cybaeus simolex* n. sp.
Plate V

Fig. 23. Ventral view of the left palpus of a male *Cybaeus cascadius* n. sp.

Fig. 24. Ventral view of the left palpus of a male *Cybaeus signifer* Simon.

Fig. 25. Ventral view of the left palpus of a male *Cybaeus tuberculatus* n. sp.

Fig. 26. Caudal process of the conductor of a left palpus of a male *Cybaeus cascadius* n. sp., ventral view.
Plate VI

Fig. 27. Caudal process of the conductor of a left palpus of a male Cybaeus eutypus Ch. and Ivie, ventral view.

Fig. 28. Caudal process of the conductor of a left palpus of a male Cybaeus morosus Simon, ventral view.

Fig. 29. Caudal process of the conductor of a left palpus of a male Cybaeus multiforma Ch. and Ivie, ventral view.

Fig. 30. Caudal process of the conductor of a left palpus of a male Cybaeus signifer Simon, ventral view.

Fig. 31. Caudal process of the conductor of a left palpus of a male Cybaeus reticulatus Simon, ventral view.

Fig. 32. Caudal process of the conductor of a left palpus of a male Cybaeus reticulatus Simon, mesal view.

Fig. 33. Caudal process of the conductor of a left palpus of a male Cybaeus exlineae Ch. and Ivie, ventral view.

Fig. 34. Caudal process of the conductor of a left palpus of a male Cybaeus exlineae Ch. and Ivie, ectal view.
Plate VII

Fig. 35. Caudal process of the conductor of a left palpus of a male Cybaeus scopulatus Ch. and Ivie, ventral view.

Fig. 36. Caudal process of the conductor of a left palpus of a male Cybaeus scopulatus Ch. and Ivie, ectal view.

Fig. 37. Caudal process of the conductor of a left palpus of a male Cybaeus tuberculatus n. sp.

Fig. 38. Caudal process of the conductor of a left palpus of a male Cybaeus simplex n. sp., ventral view.

Fig. 39. Patella of left palpus of a male Cybaeus cascadius n. sp., dorsal view.

Fig. 40. Patella of left palpus of a male Cybaeus cascadius n. sp., ventral view.

Fig. 41. Patella of left palpus of a male Cybaeus eutypus Ch. and Ivie, dorsal view.

Fig. 42. Patella of left palpus of a male Cybaeus eutypus Ch. and Ivie, ventral view.
Plate VIII

Fig. 43. Patella of left palpus of a male *Cybaeus morosus* Simon, dorsal view.

Fig. 44. Patella of left palpus of a male *Cybaeus morosus* Simon, ventral outline.

Fig. 45. Patella of left palpus of a male *Cybaeus multnoma* Ch. and "vie, dorsal view.

Fig. 46. Patella of left palpus of a male *Cybaeus multnoma* Ch. and "vie, ventral outline.

Fig. 47. Patella of left palpus of a male *Cybaeus reticulatus* Simon, dorsal view.

Fig. 48. Patella of left palpus of a male *Cybaeus reticulatus* Simon, ventral outline.

Fig. 49. Patella of left palpus of a male *Cybaeus signifer* Simon, dorsal view.

Fig. 50. Patella of left palpus of a male *Cybaeus signifer* Simon, ventral outline.
Plate IX

Fig. 51. Patella of left palpus of a male *Cybaeus exlineae* Ch. and Ivie, dorsal view.
Fig. 52. Patella of left palpus of a male *Cybaeus exlineae* Ch. and Ivie, ventral view.
Fig. 53. Patella of left palpus of a male *Cybaeus scopulatus* Ch. and Ivie, dorsal view.
Fig. 54. Patella of left palpus of a male *Cybaeus scopulatus* Ch. and Ivie, ventral outline.
Fig. 55. Patella of left palpus of a male *Cybaeus simplex* n. sp., dorsal view.
Fig. 56. Patella of left palpus of a male *Cybaeus simolox* n. sp., ventral outline.
Plate X

Graph 1. Measurements of carapace of *Cybaeus reticulatus tians* Ch. and Ivie.
GRAPH 1. LENGTH OF CARAPACE (mm.)