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(Signed) *Robin Leech*

PERMANENT ADDRESS:

Entomology Dept.
Univ. of Alberta
Edmonton 7, Alb.

DATED. *14. XII. 70* 19

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This work is inscribed with appreciation
to the late Professor Emeritus George J.
Spencer - biologist, scholar, philosopher,
and philanthropist - who, for some years,
held open the door to entomology for me
and many others.

THE UNIVERSITY OF ALBERTA

REVISION OF THE AMAUROBIID SPIDERS OF
THE NEARCTIC REGION (ARACHNIDA:ARANEIDA)

BY



ROBERT (ROBIN) ERNEST LEECH

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF ENTOMOLOGY

EDMONTON, ALBERTA

SPRING, 1971

UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read and recommend
to the Faculty of Graduate Studies for acceptance, a thesis
entitled REVISION OF THE AMAUROBIID SPIDERS OF THE NEARCTIC
REGION (ARACHNIDA:ARANEIDA) submitted by Robert (Robin) Ernest
Leech in partial fulfilment of the requirements for the degree
of Doctor of Philosophy.

J. S. Barr
.....
Supervisor
Brian Hocking
.....
D. A. Craig
.....
Th. F. Chapman
.....
J. H. E. Smith
.....
External Examiner

Date. *December 14 1970*

ABSTRACT

A revision of the species, genera, and subfamilies of the amaurobiid spiders found in the Nearctic Region is presented. Over 10,000 specimens were examined. Eighty six species are recognized, four of which are not endemic to the Nearctic Region. Forty species are described as new: Amaurobius corruptus, A. diablo, A. distortus, A. galeritus, A. intermedius, A. minutus, A. palomar, A. pilosus, A. prosopidus, A. tamalpais, A. transversus, A. triangularis, A. tulare, A. vexans, Callioplus spenceri, C. wabritaskus, Callobius gertschi, C. hyonasus, C. klamath, C. manzanita, C. panther, C. paskenta, C. pauculus, C. paynei, C. rothi, C. sierra, C. tehama, Goeldia chinipensis, Pimus desiccatus, P. eldorado, P. iviei, P. napa, P. nawtawaketus, P. salemensis, Zanomys aquilonia, Z. feminina, Z. hesperia, Z. ochra, Z. sagittaria, Z. ultima. Eleven species names are placed in synonymy for the first time. One new name, and seven new combinations are proposed.

Five subfamilies are recognized: Amaurobiinae, Arctobiinae, NEW SUBFAMILY, Desinae, Metaltellinae, and Titanoecinae. Eleven genera are recognized: Amaurobius, Arctobius, Callioplus, Callobius, Goeldia, Ixeuticus, Metaltella, Pimus, Titanoeca, Tugana, and Zanomys. Two generic names, Walmus and Exlinea, are placed in synonymy for the first time.

Keys are provided for the subfamilies, genera, and for most of the species. Each genus and species is described and synonymies listed.

The distribution of most species is presented by locality records and distribution maps. Descriptions and measurements of each species are given. A subfamily and generic phylogeny, and a short zoogeographic analysis are given. Ichneumonid egg parasites and mermithid (Nematoda) worms in adult or subadult specimens are recorded for the first time for several species.

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- Fig. 124. Ectal view of left palpal tibia of Amaurobius agastus.
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- Fig. 130. Ectal view of left palpal tibia of Amaurobius mathetes.
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- Fig. 135. Full view of left median apophysis of Amaurobius tulare.
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- Fig. 227. Ventral view of epigynum of Callobius canada.
- Fig. 228. Posterior view of epigynum of Callobius canada.
- Fig. 229. Ventral view of epigynum of Callobius deces.
- Fig. 230. Posterior view of epigynum of Callobius deces.
- Fig. 231. Ventral view of epigynum of Callobius enus.
- Fig. 232. Posterior view of epigynum of Callobius enus.
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- Fig. 301. Ventral view of epigynum of Pimus nawtawaketus.
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- Fig. 343. Ventral view of epigynum of Amaurobius diablo (a second specimen).

- Fig. 344. Ventral view of epigynum of Amaurobius diablo (a third specimen).
- Fig. 345. Ventral view of epigynum of Amaurobius galeritus.
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- Fig. 351. Ventral view of epigynum of Amaurobius mephisto.
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- Fig. 362. Posterior view of epigynum of Amaurobius triangularis.
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- Fig. 364. Posterior view of epigynum of Amaurobius prosopidus.
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- Fig. 366. Ventral view of epigynum of Zanomys kaiba (a second specimen).
- Fig. 367. Ventral view of epigynum of Zanomys sagittaria.
- Fig. 368. Ventral view of epigynum of Zanomys aquilonia.

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- Fig. 370. Dorsal view of opisthosoma of Zanomys californica.
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- Fig. 375. Ventral view of epigynum of Titanoeca nigrella.
- Fig. 376. Ventral view of epigynum of Titanoeca silvicola.
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- Fig. 387. Ventral view of epigynum of Tugana cavatica.
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- Fig. 394. Geographical distribution of Callobius panther (●) and Callobius paskenta (▲).
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- Fig. 400. Geographical distribution of Callobius deces.
- Fig. 401. Geographical distribution of Callobius nevadensis.
- Fig. 402. Geographical distribution of Callobius hyonassus.
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- Fig. 406. Geographical distribution of Callobius olympus (■) and Callobius rothi (●).
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- Fig. 408. Geographical distribution of Callobius pictus.
- Fig. 409. Geographical distribution of Callobius severus.
- Fig. 410. Geographical distribution of Callioplus euoplus (●) and Callioplus spenceri (▲).
- Fig. 411. Geographical distribution of Callioplus tibialis (●) and Callioplus wabritaskus (▲).

- Fig. 412. Geographical distribution of Callioplus macarius.
- Fig. 413. Geographical distribution of Callioplus pantoplus.
- Fig. 414. Geographical distribution of Callioplus hoplites.
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- Fig. 417. Geographical distribution of Pimus pitus (●) and Pimus iviei (▲).
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- Fig. 421. Geographical distribution of Pimus hesperellus (●) and Pimus leucus (▲).
- Fig. 422. Geographical distribution of Amaurobius ferox (●) and Metaltella simoni (▲).
- Fig. 423. Geographical distribution of Amaurobius borealis.
- Fig. 424. Geographical distribution of Amaurobius agastus (●), Amaurobius dorotheae (▲), and Amaurobius mathetes (■).
- Fig. 425. Geographical distribution of Amaurobius tulare (●) and Amaurobius tamalpais (▲).
- Fig. 426. Geographical distribution of Amaurobius heathi (●), Amaurobius vexans (▲), and Amaurobius barbaricus (■).
- Fig. 427. Geographical distribution of Amaurobius latescens.
- Fig. 428. Geographical distribution of Amaurobius corruptus (●), Amaurobius diablo (▲), and Amaurobius distortus (■).

- Fig. 429. Geographical distribution of Amaurobius galeritus (●),
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- Fig. 431. Geographical distribution of Amaurobius triangularis (▲)
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- Fig. 432. Geographical distribution of Zanomys kaiba (●) and Zanomys
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- Fig. 433. Geographical distribution of Zanomys aquilonia (●) and
Zanomys californica (■).
- Fig. 434. Geographical distribution of Zanomys hesperia (●) and
Zanomys ultima (■).
- Fig. 435. Geographical distribution of Zanomys feminina (●) and
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- Fig. 436. Geographical distribution of Ixeuticus martius.
- Fig. 437. Geographical distribution of Arctobius agelenoides.
- Fig. 438. Geographical distribution of Titanoeca nigrella (▲) and
Titanoeca brunnea (●).
- Fig. 439. Geographical distribution of Titanoeca americana (●) and
Titanoeca silvicola (▲).
- Fig. 440. Geographical distribution of Goeldia chinipensis (●) and
Goeldia mexicana (▲).
- Fig. 441. Geographical distribution of the genus Callobius in the
Nearctic Region.

- Fig. 442. Geographical distribution of the genus Callioplus in the Nearctic Region.
- Fig. 443. Geographical distribution of the genus Pimus.
- Fig. 444. Geographical distribution of the genus Amaurobius in the Nearctic Region.
- Fig. 445. Geographical distribution of the genus Zanomys.
- Fig. 446. Geographical distribution of the genus Arctobius in the Nearctic Region.
- Fig. 447. Geographical distribution of the genus Titanoeca in the Nearctic Region.
- Fig. 448. Geographical distribution of the genus Goeldia in the Nearctic Region.
- Fig. 449. Number of species of amaurobiids plotted in 10° intervals throughout the Nearctic Region.
- Fig. 450. Time-divergence dendrogram of the history of Nearctic Amaurobiidae.

INTRODUCTION

The spider fauna of North America is very poorly known, mainly because there have been very few spider taxonomists compared, for example, with beetle taxonomists. The need is great for more work like that of Kaston (1948), on the spider fauna of Connecticut, which is unexcelled. To date, a number of selected families, subfamilies, and genera (e.g., Dictynidae, Plectreuridae, Theridiidae, Uloboridae, Marpissinae, Islandiana, Zygiella) have been studied for the Nearctic Region, but in no area on mainland North America, except for New England, is most of the spider fauna known. As family and generic revisions must precede regional faunal studies, this situation is not likely to change in the foreseeable future. The present study is one more building block in the wall of knowledge of the Nearctic spider fauna.

The family Amaurobiidae is considered by most present-day arachnologists to include only cribellate spiders. About a third of the nearly 300 species from all zoogeographical regions recognized for the family are placed in the genus Amaurobius. This number will probably be much reduced when a world revision of Amaurobius is completed, as the genus (sensu str.) seems to be confined to the Holarctic Region. The family is represented throughout the world, from the tropical to the cold temperate regions.

This study is a taxonomic treatment of the Nearctic and introduced spiders of the family Amaurobiidae and deals with 86 species

representing 11 genera in five subfamilies. The Nearctic Region here is interpreted as extending throughout North America south to the southern limits of the Oaxacan Plateau. Only a few amaurobiids endemic to North America have been found south of the United States-Mexico border, mainly because of inadequate material from Mexico.

The northern end of the Sierra Madre Occidental in Mexico seems to be the southern limits of distribution for most of the Nearctic species of this family. The larger amaurobiids, e.g., representatives of the genus Callobius, are replaced in Mexico and Central America by a related cribellate family Tengellidae (Zorocrates species). The northern distribution limit of the amaurobiids in the Nearctic Region appears to be the tree line, as no specimens have yet been collected north of the tree line, though some species have been collected above tree line in the Rocky Mountains.

A large collection of endemic and introduced species of amaurobiids has been amassed at the American Museum of Natural History, mainly through the efforts of V.D. Roth, B. Malkin, the late W. Ivie, and W.J. Gertsch. Another large collection, mainly from eastern North America, has been amassed in the Museum of Comparative Zoology at Harvard University. It is from these two sources, plus a fairly large collection of my own, that most of the material for the present study has been drawn.

MATERIALS

This study was based on an examination of over 10,000 immature and adult specimens of Amaurobiidae. The material came chiefly from the western United States, though Callobius bennetti (Blackwall) from eastern North America was represented by over a thousand specimens.

Most of the specimens for this study were borrowed from institutes in Canada and the United States. I made one major collecting trip to the western United States in August, 1968, to collect at type localities (when only males or females were known, or to collect more topotypic material), and at other localities to fill in distribution gaps or to find specimens of undescribed species. Over 1,000 adult specimens were collected on this trip.

Abbreviations for the institutes and individuals from which material was borrowed for this study are as follows:

- AMNH American Museum of Natural History, New York (J.A.L. Cooke, the late W. Ivie, W.J. Gertsch, and V.D. Roth).
- ANSP Academy of Natural Sciences of Philadelphia (S.S. Roback).
- BCPM British Columbia Provincial Museum, Victoria (E. Thorn).
- BJK B.J. Kaston collection, San Diego, California.
- BMNH British Museum (Natural History), London (D.J. Clark).
- CAS California Academy of Sciences, San Francisco (P.H. Arnaud, Jr., H.B. Leech).
- CMNH Chicago Museum of Natural History, Chicago (R.L. Wenzel).
- CNC Canadian National Collection, Ottawa (C.D. Dondale, G.P.

Holland, J.E.H. Martin).

- CU Cornell University Collection (on indefinite loan to
AMNH) (J.A.L. Cooke).
- DCL D.C. Lowrie collection, Los Angeles, California.
- DEB David E. Bixler collection, Alta Loma, California.
- DJB D.J. Buckle collection, Lady Lake, Saskatchewan.
- FFF Canadian Forestry Collection, Fredericton, New Brunswick
(T. Renault).
- HEF H. Exline-Frizzell collection, Rolla, Missouri (the late
H. Exline-Frizzell, and W.B. Peck).
- INHS Illinois Natural History Survey, Urbana (J.D. Unzicker).
- JAB Joseph A. Beatty collection, Carbondale, Illinois.
- JEC J.E. Carico collection, Lynchburg, Virginia.
- KABC Agriculture Research Station, Kamloops, British Columbia
(L.C. Curtis, J. Gregson).
- LU Lakehead University, Thunder Bay, Ontario (R. Freitag).
- MCZ Museum of Comparative Zoology, Harvard University (H.W.
Levi).
- MET Mel E. Thompson, Los Angeles County Museum, Los Angeles,
California.
- MNHN Museum National d'Histoire naturelle, Paris (M. Hubert).
- MU McGill University collection, Montreal (P.R. Grant).
- OSU Ohio State University, Columbus, Ohio (C.A. Triplehorn).
- OU Oxford University, Oxford (J.A.L. Cooke).
- PRC Patrick R. Craig collection, Berkeley, California.
- RL Robin Leech collection, Edmonton, Alberta.
- ROM Royal Ontario Museum, Toronto (G.B. Wiggins).

- WAS William A. Shear collection, Harvard University.
- SMUK Snow Museum, University of Kansas, Lawrence (G.S. Byers).
- UCM University of Colorado Museum, Boulder (H. Rodeck, R. Schmoller).
- ULS University of Lund, Sweden.
- UN University of Nevada, Reno (I. La Rivers).
- USNM United States National Museum, Washington (R.E. Crabill).
- UU University of Utah, Salt Lake City, Utah (the late R.V. Chamberlin, G.H. Edmunds, Jr.).
- ZIUW Zoologisches Institut der Universität, Wien (H. Nemenz).
- ZMUH Zoological Museum of the University, Helsinki (W. Hackman).
- ZMUU Zoological Museum, Uppsala University, Uppsala (Å. Holm).

There are a number of excellent gazetteers and atlases published that are invaluable to the taxonomist trying to find obscure localities. The following were used for this study: general localities in the United States (Cram, 1902); Arizona (Granger, 1960); California (Gudde, 1969); Idaho (Kramer, 1951-1952); Nebraska (Fitzpatrick, 1925); New Mexico (Pearce, 1965); Oregon (McArthur, 1965); Washington (Jones, 1970. Landes, 1917). A "Gazetteer of Utah Localities and Altitudes, 1952" was published by the Division of Biology, University of Utah, Salt Lake City, and Rand McNally has published the "Pocket Map" series. The latter were issued singly, in 1962, for each state in the United States, and each contains an excellent map and gazetteer.

For localities in Canada, the "Gazetteer of Canada" series, and supplements, for each province and territory (except for Québec) is available from the Queen's Printers, Ottawa. The provincial government

of Québec has published "Répertoire Géographique du Québec", in 1969. This is available from the Québec Provincial Government.

For localities in Mexico, one of the most useful references is "Mexico, Guia de las Vias Generales de Comunicacion, 1963", published by the Departamento de Planacion.

One of the most useful books for obtaining Latin and Greek words for taxonomic names is that of Woods (1966). Others are those of Brown (1956) and Borrer (1960).

METHODS

1. General.

The terminology used in the keys and the text is explained by discussion (see Glossary, p. 339) and labelled drawings. All color descriptions and measurements of specimens or parts thereof are based on preserved material, but color of live specimens is noted where known. All measurements are in millimeters. Biological data have been compiled from the literature, from information on labels in vials, and from personal observation.

2. Criteria for the recognition of species.

Schick (1965) stated that he attempted laboratory matings involving both intra- and interspecific crosses, but he did not state how he determined what represented a species. Dondale (1964), who studied behavioral characteristics, described a new species and identified two sympatric spider species, which had originally been placed under one species name, by using Dobzhansky's (1941) genetic criteria for specific distinctiveness. Dondale and Redner (1968) reduced the species named in 1964 to a subspecies.

The criterion used generally for placing together all individuals that represent one species is, when lacking breeding information, the constancy of distinctiveness, assuming that one has male and female animals that were capable of interbreeding. The implication is that all individuals placed together as representing one species were (at one time or another) members of an interbreeding

population. Distinctiveness is defined as the condition in which a set of characteristics of a given animal species will always separate the members of that species from all other species. In this study, constancy of morphological distinctiveness is of necessity the primary criterion, though several of the species were recognized initially by a geographical distribution criterion rather than morphological distinctiveness.

3. Criteria for defining the genera and subfamilies.

An objective criterion or set of criteria is impossible to state for defining the genus taxon (Blackwelder, 1967:56; Mayr, 1969:92). As there is no way to establish that the species grouped within a particular genus are the descendants of a parent species common to all, the best one can say is that a genus is represented by a species or group of species sharing certain stated and defined characteristics, and that for a phylogenetic classification, monophyly is implied. One may say also that the delimiting of a genus is a matter of convenience and practicality. Mayr (1969:92) states: "A genus is a taxonomic category containing a single species, or a monophyletic group of species, which is separated from other taxa of the same rank [other genera] by a decided gap." The correct statement should have read, "The genus is a taxonomic category... " or, "A genus is a taxon...". The decided gap is established by specialists of the group under consideration. The genus is a convenient operational unit. The conditions that hold for the genus taxon also hold for the subfamily and family taxa.

For example, the family Amaurobiidae is large in the sense that it contains many species. It is very difficult to work out a detailed

statement of relationships, and it is equally difficult to provide a sound formal classification. The ranking of taxa in the Amaurobiidae, as in all animal groups, is arbitrary. Thus the placement and ranking of a genus taxon, e.g., Callobius, is a matter of opinion.

4. Examination procedures.

Carapaces were measured from directly above the specimens. Carapace length is the distance along the midline from the most anterior part of the carapace, excluding the bulge of the eyes, to the incurve of the posterior margin. Carapace width is taken at widest part. The length of a limb or any article thereof, is measured along the (morphologically) dorsal side of the limb or article. Total length is the length from the anterior margin of the carapace to the posterior tip of the opisthosoma when the opisthosoma is in a straight line with the prosoma. Total length is of relative size value only, as opisthosomas vary in length according to the quantity of food eaten by the spider, or development of eggs.

The eyes are designated in pairs in the following manner: anterior median eyes (AME), anterior lateral eyes (ALE), posterior median eyes (PME), and posterior lateral eyes (PLE). The four median eyes are referred to as the median ocular area (MOA) or median ocular quadrangle (MOQ), or rarely, median ocular trapezium (MOT) (sensu Lehtinen, 1967).

The movable spines on the ventral side of the anterior metatarsi are particularly useful as key characteristics for species recognition in some genera. Figs. 1 - 6 illustrate the spine positions and

variations in number distally and basally on Metatarsi I and II as found in members of the genus Callobius. The spination of a regenerated leg is considerably different from that of a normal leg. If a leg article on one side of the animal bears a spine or set of spines, the spine or set of spines is interpreted as being present.

The term "genitalia" in male spiders refers usually to the palpus and its included organs. For the male spider, Figs. 10 - 14 illustrate the diagnostic characteristics as used in the key and descriptions, and show the processes and points from which the comparative measurements for ratios are taken. Recognition of homologies among the parts within the male palpus of Amaurobiidae were established by dissection and relaxation of palpi as suggested by Comstock (1910), Gering (1953), Levi (1961, 1965), and Shear (1967). Terminology used here is that established by Comstock (1910) and followed by most authors since. I relaxed palpi of members of the following families in order to establish more surely the homologies: Agelenidae (Agelenopsis sp., Tegenaria spp.), Amaurobiidae (Amaurobius spp.), Lycosidae (Lycosa spp., Pardosa spp., Tarentula sp.) and Pisauridae (Dolomedes sp.).

The term "genitalia" in the female spider refers usually to the epigynum (see explanation Figs. 7 - 9).

All specimens and parts thereof were examined in alcohol under the microscope as suggested by Levi (1965). Only rarely were the epigyna separated from the opisthosoma (except in members of the genus Titanoeca) as described by Levi (1965), because I found that the spermathecae and copulation tubes were of little taxonomic use - except

in members of the genus Titanoeca. A palpus was, in some cases, removed from the spider in order to examine and draw the palpus from the desired points of view. For storage and transportation, the palpus was placed in a microvial stoppered with cotton wool and kept in a larger vial with the rest of the spider. The particular specimen drawn is indicated by a label in the vial when the specimen is not the holotype, and when a new species is described, it is the holotype that is drawn.

5. Specimen preservation.

Most freshly collected specimens were preserved in 80% ethyl alcohol. The alcohol was replaced at least twice before permanent storage. All specimens were kept in 80% ethyl alcohol for permanent storage and transportation. A few specimens were fixed in Bouin's Solution for chromosome studies at a later date.

6. Rearing immature specimens.

Many of the specimens were collected as immature spiders and kept singly in four ounce bottles with bakelite lids. I put pieces of rotten wood and moss in with each specimen to provide moisture, footholds, and web-building sites. Except for the very young spiders, there was very low mortality among the spiders when I used this method.

7. Mating attempts.

Intraspecific matings were attempted in two species. Males and females of Arctobius agelenoides (Emerton) were introduced to one another, but the females attacked and killed the males before the males were able to start courtship. The same procedure was tried also with males and

females of Callobius nomeus (Chamberlin), but again the females attacked and killed the males.

8. Drawings and distribution maps.

Identifications were made with the aid of a Leitz stereo microscope. All drawings were made with the aid of a Leitz camera lucida on Leitz stereo and Leitz Laborlux binocular compound microscopes. Light was supplied by a 100 watt Wild quartz-iodide lamp. A Leitz 10 mm ocular micrometer scale with 200 divisions was used for all measurements with the stereo microscope. A calibrated ocular micrometer with 100 divisions was used with the compound microscope. Measurements of parts of the spiders were made mostly at 50 and 100 diameters, occasionally at 150 diameters. Total lengths of spiders, depending upon the spider's size, were measured at 12.5, 25, and 50 diameters.

Each map shows the distribution of one or more species by designated symbols. These maps do not list the literature records, but only those distribution records that I was able to confirm by examination of a specimen.

9. Criteria for selecting the holotype and type locality.

In selecting the holotype of a species, except where a single specimen represents the species, I tried to do the following:

1. Select an "average specimen", where possible, a male.
2. Select a specimen from somewhere near the middle of the known distribution.
3. Select a relatively indestructible type locality. For example,

a locality within a National Park area, rather than nearby but outside the park, is preferable.

4. Select a specimen in good to excellent condition.

THE TAXONOMIC STATUS OF CRIBELLATAE

Bertkau (1882) was the first to emphasize the possible taxonomic significance of the presence of a cribellum and a calamistrum in classifications at the family level and higher by grouping together several cribellate families. Simon (1892-1903) followed suit and thus the taxa Cribellatae and Ecribellatae became standard in spider classification.

Petrunkévitch (1923:155) doubted that the placing of cribellate araneomorph families in one group (Cribellatae) and the ecribellate in another group (Ecribellatae) resulted in a "natural classification", and elaborated on this later (1928, 1933, and Petrunkévitch et al., 1939). A result of Petrunkévitch's work is that there are now two main "camps" of spider taxonomists - those who follow the Bertkau classification and those who follow the Petrunkévitch classification. Some of those who follow Petrunkévitch are Bonnet (1959), Roewer (1928), Giltay (1926), Lehtinen (1967), and Forster (1970). Some of those in agreement with Bertkau are Simon (1892-1903), Comstock (1912), Kishida (1930), Berland (1932), Bristowe (1938, 1958), Gertsch (1949), Levi (1967), and Marples (1968).

Lehtinen (1967) questioned if the cribellum should be accorded the standing of a family characteristic, and radically relimited the existing families and included cribellate and ecribellate genera in the same family. Forster (1970:12, 16) writes that he does not agree with all of the family limitations and groupings and the distributions of

genera amongst the families proposed by Lehtinen, and added there can be little doubt that the general concept that the loss of the cribellum and calamistrum may be represented at different taxonomic levels is correct. Forster (in litt., 4th August, and 21st September, 1970) has found cribellate and ecribellate members of the same genus (Gradungula: Gradungulidae). Heretofore, the members of the family Gradungulidae were thought to be cribellate only.

Therefore, the suprafamilial taxa Cribellatae and Ecribellatae must be eliminated, per se, and a given araneomorph taxon can be referred to as being cribellate, ecribellate, or both. Each taxon will have to be reassessed individually in order to confirm whether or not species or genera previously considered unrelated because of the presence or absence of a cribellum are related.

HISTORICAL REVIEW OF THE FAMILY NAME AMAUROBIIDAE

The taxonomic status and family-subfamily associations of Amaurobiidae have always been contentious, especially in relation to Dictynidae, Drassidae (=Gnaphosidae), and Agelenidae. When the family Drassides was erected by Koch (1837:15), the genus Amaurobius was placed therein, and Thorell (1870:117-127) placed Amaurobius in the Agelenidae (=Agelenides Koch, 1837; = Agalenoidae Thorell, 1870).

Thorell (1870) in a paper on classification of European spiders, erected the subfamily Amaurobiinae, with the type genus Amaurobius Koch, 1837, in the family Agelenidae. The genera in Amaurobiinae of Thorell are today either in the family Amaurobiidae or Dictynidae. Previous to this Blackwall (1833, 1841a) described some vestigial spinnerets, and special curved hairs on Metatarsus IV, and on the bases of these examinations he designated a new genus, Ciniflo, and a new family, Ciniflonidae (Blackwall, 1841b). The type species of the genus Ciniflo Blackwall, 1841b, is the same as that for Amaurobius Koch, 1837. Thus, Ciniflo is a junior objective synonym of Amaurobius. As the family name Ciniflonidae is the first suprageneric usage for this taxon, it is, historically, the name to be used in preference to Amaurobiidae. However, in this case, stability dictates the usage of Amaurobiidae over Ciniflonidae, and Levi and Kraus (1964) petitioned the International Commission of Zoological Nomenclature to place Ciniflo and Ciniflonidae on the official list of rejected and invalid names.

Finally, the family name Dictynidae has been used frequently in place of Amaurobiidae, mainly because of the influence of Simon (1892-1903).

Family Amaurobiidae Thorell

Ciniflonidae Blackwall, 1841b:606.

TYPE GENUS: Ciniflo Blackwall, 1841b:607.

TYPE SPECIES: Clubiona atrox Latreille, 1806 (= Aranea fenestralis Ström, 1768), by original designation and monotypy.

Amaurobiinae Thorell, 1870:121.

TYPE GENUS: Amaurobius Koch, 1837:15.

TYPE SPECIES: Aranea fenestralis Ström, 1768:362.

REMARKS

For discussion pertinent to the use of Ciniflonidae and Amaurobiidae, see NOTES ON SYNONYMY under the genus Amaurobius.

DIAGNOSIS OF THE FAMILY AMAUROBIIDAE

Six or eight eyes; if eight eyes, then in two transverse rows, all pale in color. Male with median apophysis in palpal organ. Chelicerae robust, geniculate (except members of genus Zanomys) at base anteriorly, and bearing boss and scopula. Labium notched basally. Legs moderately to heavily spined, rarely lacking spines (except members of genus Zanomys). Trichobothria in one or two rows on tibiae, none on femora. Thoracic groove longitudinal when present. Cribellum and calamistrum present, but calamistrum reduced or absent in males of some species. Three tarsal claws. Claw tufts or tarsal scopulae lacking. Mating position with male on ventral side of female (Position I or I-modified).

Key to the subfamilies and Genera
of Amaurobiidae

1. Trichobothria short and thick, not extended much above general leg hairs, and not increased in length distally on leg segments (usually only one or two on tarsi and metatarsi) ...
..... Titanoecinae 2
- Trichobothria long and thin, increased in length distally on tarsi and metatarsi 4
- 2 (1). Eight eyes in two rows 3
- Six eyes, AME lacking Tugana Chamberlin, p. 278
- 3 (2). Male with palpal patellar process. Female with external sclerotized part of epigynum broad and flat with openings to copulation tubes at lateral, posterior parts of epigynum .
..... Goeldia Keyserling, p. 272
- Males without palpal patellar process. Females with external sclerotized part of epigynum T-shaped or triangular
..... Titanoeca Thorell, p. 249
- 4 (1). Five or six teeth on pro- and retromargins of cheliceral fang furrows Metaltellinae...Metaltella Mello-Leitão, p. 283
- At most four teeth on pro- and retromargins of cheliceral fang furrow 5
- 5 (4). Eyes with each row approximately equally spaced
..... Arctobiinae...Arctobius Lehtinen, p. 242
- Eyes within each row differently spaced, AME usually much closer to one another than to ALE 6

- 6 (5). AME distinctly largest eyes, about 1.4 times larger than
ALE Desinae...Ixeuticus Dalmas, p. 290
- AME at most only 1.2 times larger than ALE .. Amaurobiinae 7
- 7 (6). Definite or distinct spines or bristles lacking on legs;
chelicerae not geniculate Zanomys Chamberlin, p. 225
- Spines or bristles present on legs; chelicerae distinctly
geniculate 8
- 8 (7). Male 9
- Female 12
- 9 (8). Embolus long and thin, origin near base of cymbium, extended
forward medially and curved around distal end of palpal organ;
embolus of almost uniform thickness throughout length
..... Pimus Chamberlin, p. 151
- Embolus short and thick, slightly arcuate, origin medial about
midpoint of palpal organ and termination at distal end of
palpal organ 10
- 10 (9). Palpal tibia with simple processes distally; all processes
tapered, thinner distally than basally when seen from all
aspects Callobius Chamberlin, p. 22
- Not as above 11
- 11 (10). Palpal tibia distally with two processes only; mesal process
with one or more subprocesses, considerably longer than ectal
process, and arched anterolaterally over cymbium
..... Callioplus Bishop and Crosby, p. 123
- Palpal tibia distally with two or three processes; mesal
process simple Amaurobius Koch, p. 172

- 12 (8). Lateral lobes of epigynum large, convergent posteriorly;
spermathecae in lateral lobes 13
- Lateral lobes of epigynum small or absent; spermathecae under
epigynal plate, not in lateral lobes 14
- 13 (12). Epigynum with posterior and median lobes (one or other very
small in some specimens) Callobius Chamberlin, p. 22
- Epigynum without posterior or median lobes; lateral lobes
flat, projecting posteriorly beyond epigastric furrow
..... Callioplus Bishop and Crosby, p. 123
- 14 (12). Epigynum with posterior lobe not enclosed by lateral lobes
(Figs. 320, 330, 334). Posterior lobe much darker than
epigynal plate and lateral lobes; posterior lobe plain ...
..... Amaurobius Koch, p. 172
- Epigynum with posterior lobe mostly enclosed by lateral lobes,
except for small piece at posterior margin of epigynum;
posterior lobe horseshoe-shaped in outline (Figs. 292 - 310);
middle of face of posterior lobe with rounded, darkened
bulge Pimus Chamberlin, p. 151

Subfamily Amaurobiinae Thorell

Amaurobiinae Thorell, 1870:121.

Synopsis of the subfamily Amaurobiinae.

Petrunkévitch et al. (1939:164) divided the family Amaurobiidae into two subfamilies, Ixeuticinae and Amaurobiinae, on the basis of one or two rows of curved hairs, respectively, in the calamistrum.

Lehtinen (1967:336) states that Amaurobiinae, sensu Petrunkevitch "... is largely identical with mine ...". The interpretation of Amaurobiinae in this study is much like that of Lehtinen, except that the genera Pimus and Zanomys, which Lehtinen placed in Macrobininae, are included in Amaurobiinae. It is further considered in this study (in agreement with Lehtinen, 1967:340) that the subfamily Amaurobiinae is a purely Holarctic group.

Genus Callobius Chamberlin

Callobius Chamberlin, 1947:6.

TYPE SPECIES: Ciniflo bennetti Blackwall, 1846:41, by original designation.

REMARKS

The males of this genus have a long, thin mesal process (except for members of the species Callobius pictus) on the palpal tibia, and the females of this genus have two large lateral lobes (containing the spermathecae) that converge posteriorly and encircle the median lobe. Members of the genus Callobius are found in the Holarctic Region only. No species are Holarctic.

Members of the genus Callobius were originally treated as the bennetti group of Amaurobius by Chamberlin and Ivie (1947b). Later in the same year, Chamberlin (1947) erected the genus Callobius, basing it on all the species contained in the bennetti group of Amaurobius. Amaurobius alaskanus Chamberlin and Ivie, 1947b:33, is the only name removed from the genus Callobius, because it is a junior synonym of Amaurobius similis (Blackwall, 1861).

Members of the genus Callobius are most closely related to those of the genus Callioplus, though in size and color they are most like those of the genus Amaurobius. Callobius hokkaido Leech, from the island of Hokkaido, Japan, appears to be very closely related to some of the Callobius species from western North America (e.g., Callobius klamath, new species). There are fewer than five species of the genus

Callobius known from the Palearctic Region.

DIAGNOSIS OF THE GENUS Callobius.

Cribellum bipartite. Calamistrum present in female, delimited at each end by one spine. Calamistrum lacking or nonfunctional in male. Epigynum with two large lateral lobes convergent posteriorly around small, ovoid median lobe. Lateral lobes with spermathecae. Posterior lobe subtriangular to subpentagonal in shape, hidden in epigastric furrow. Palpal tibiae each with three simple processes distally, mesal process longest (except in C. pictus). Ectal process tapered or of uniform thickness throughout, not expanded distally. From above, AER straight, PER slightly procurved. From front, AER slightly procurved, PER distinctly so. PER longer than AER. MOA wider behind than in front, and about as long as wide behind.

Key to the Nearctic species
of the genus Callobius

- 1. Male 2
- Female 24
- 2 (1). Tibia of palpus with distance from tip of mesal process to
 bottom of notch between mesal and dorsal processes distinctly
 shorter than distance from bottom of notch to articulation
 point at base of tibia 3
- Tibia of palpus with distance from tip of mesal process to
 bottom of notch between mesal and dorsal processes about same
 length as or longer than distance from bottom of notch to
 articulation point at base of tibia 5
- 3 (2). Mesal process very short, shorter than dorsal process
 pictus (Simon), p. 108
- Mesal process longer than dorsal process 4
- 4 (3). Mesal process blunt, round and smooth at tip
 tamarus (Ch. and Ivie), p.84
- Mesal process tapered to fine, needle-like point at tip ..
 kamelus (Ch. and Ivie), p.81
- 5 (2). Dorsal process situated on base of mesal process (Figs.
 15, 17, 19) 6
- Dorsal process not situated on base of mesal process (Figs.
 43, 46) 10
- 6 (5). Base of dorsal process with second smaller process or ridge
 present between it and attachment point of cymbium 7

- Dorsal process single, smaller process or ridge absent between it and attachment point of cymbium 9
- 7 (6). Mesal process about 10 times as long as dorsal process ...
..... angelus (Ch. and Ivie), p.35
- Mesal process about five or six times as long as dorsal process 8
- 8 (7). Mesal process about five times as long as dorsal process;
primary and secondary cusps on median apophysis separated by deep notch (Figs. 12, 27) paskenta, new species, p.44
- Mesal process about six times as long as dorsal process;
primary and secondary cusps on median apophysis separated by shallow notch (Figs. 14, 22) manzanita, new species, p.38
- 9 (6). Mesal process about four times as long as dorsal process;
dorsal process tapered to point at tip, and longer than wide at base tehama, new species, p. 120
- Mesal process about six times as long as dorsal process;
dorsal process rounded at tip, about as long as wide at base panther, new species, p.41
- 10 (5). Dorsal process obliquely truncate and/or with concave margin margin distally 11
- Dorsal process more or less rounded or pointed distally .. 14
- 11 (10). Mesal process about five times as long as dorsal process . 12
- Mesal process about three times as long as dorsal process, or less than three times as long as dorsal process 13
- 12 (11). Distance from tip of mesal process to bottom of notch between mesal and dorsal processes more than twice the distance from

- bottom of notch to articulation point at base of tibia ...
 olympus (Ch. and Ivie), p. 101
- Distance from tip of mesal process to bottom of notch between
 mesal and dorsal processes about 1.5 times the distance from
 bottom of notch to articulation point at base of tibia ...
 deces (Ch. and Ivie), p.67
- 13 (11). Mesal process about three times as long as dorsal process
 rothi, new species, p. 104
- Mesal process about two times as long as dorsal process ..
 severus (Simon), p. 114
- 14 (10). Mesal process from dorsal aspect of almost uniform thickness
 throughout it entire length 15
- Mesal process from dorsal aspect gradually or irregularly
 tapered to point 17
- 15 (14). Mesal process blunt at end, somewhat spatulate from lateral
 aspect 16
- Mesal process tapered to fine point at tip
 nomeus (Chamb.), p. 95
- 16 (15). Distal margin of median apophysis distinctly concave (see Fig.
 44) gertschi, new species, p. 74
- Distal margin of median apophysis straight or nearly so,
 almost at right angle to length of median apophysis (see Fig.
 48) sierra, new species, p. 77
- 17 (14). Posterior or ectal margin of mesal process straight (Fig. 41)
 18
- Posterior or ectal margin of mesal process singly or doubly
 arcuate (Figs. 28, 55) 19

- 18 (17). Mesal process about four times as long as dorsal process .
 enus (Ch. and Ivie), p. 70
- Mesal process about three times as long as dorsal process
 nevadensis (Simon), p. 89
- 19 (17). Dorsal process slanted towards mesal process, not along limb
 axis 20
- Dorsal process pointed along limb axis 21
- 20 (19). Mesal process about three times as long as dorsal process;
 secondary cusp lacking from median apophysis
 nomeus (Chamb.), p. 95
- Mesal process about 3.5 times or more as long as dorsal
 process; secondary cusp present on median apophysis
 klamath, new species, p. 87
- 21 (19). Distance from tip of mesal process to tip of dorsal process
 about two times distance from tip of mesal process to tip of
 ectal process paynei, new species, p. 46
- Distance from tip of mesal process to tip of dorsal process at
 most 1.8 times distance from mesal process to tip of ectal
 process 22
- 22 (21). Distance from tip of mesal process to tip of dorsal process
 about 1.2 times distance from tip of mesal process to tip of
 ectal process canada (Ch. and Ivie), p. 64
- Distance from tip of mesal process to tip of dorsal process
 about 1.75 times distance from tip of mesal process to tip of
 ectal process 23

- 23 (22). Metatarsi I and II each with two ventral spines at distal end (four spines visible); Range:- southwestern United States, northern Mexico arizonicus (Ch. and Ivie), p. 48
- Metatarsi I and II each with one ventral spine at distal end (three spines visible); Range:- eastern North America west to Manitoba and Minnesota, south to Tennessee bennetti (Blackwall), p. 53
- 24 (1). Metatarsi I and II each with one ventral spine at distal end (three spines visible) 25
- Metatarsi I and II each with two ventral spines at distal end (four spines visible) 39
- 25 (24). Metatarsi I and II each with three or four spines visible near base below 26
- Metatarsi I and II each with two spines near base below .. 30
- 26 (25). AME smaller than PME kamelus (Ch. and Ivie), p. 81
- AME larger than PME 27
- 27 (26). Ectal lobes of epigynum present, though small on some specimens; Range:- Rocky Mtn region westward in United States nevadensis (Simon), p. 89
- Ectal lobes absent from epigynum 28
- 28 (27). Median lobe of epigynum very small and obscure, about 0.33 times as wide as a lateral lobe or less; posterior lobe of epigynum about 0.66 times as wide as long; Range:- coastal Alaska south to coastal California pictus (Simon), p.108
- Median lobe of epigynum distinct; median lobe about 0.5 times as wide as lateral lobe 29

- 29 (28). Posterior lobe of epigynum distinctly longer than wide; Range:
 - eastern North America from Newfoundland west to Manitoba and
 Minnesota, south to Tennessee bennetti (Blackwall), p. 53
- Posterior lobe of epigynum about as long as wide; Range:-
 northern California, possibly southern Oregon
 panther, new species, p. 41
- 30 (25). Posterior lobe of epigynum about as wide as long 31
- Posterior lobe of epigynum distinctly wider than long or
 longer than wide 36
- 31 (30). AME larger than PME 32
- AME same size as or smaller than PME 35
- 32 (31). Median lobe of epigynum round, large and obvious; posterior
 margins of lateral lobes concave or dished out (Fig. 240)
 hyonasus, new species, p. 79
- Not as above 33
- 33 (32). Lateral lobes of epigynum convergent but not in contact with
 each other posterior to median lobe so that median lobe and
 posterior lobe appear to be continuous with one another (Fig.
 258), or if almost in contact with one another, then median
 lobe two times as long as wide. Range:- New England, Quebec,
 and Labrador, west to Rocky Mtns on to west coast
 nomeus (Chamb.), p. 95
- Not as above 34
- 34 (33). Median lobe ovate, conspicuous. Dorsal opisthosomal markings
 obscure or lacking. Range:- San Francisco County south to
 Monterey County olympus (Ch. and Ivie), p.101

- Median lobe small, often inconspicuous. Dorsal opisthosomal markings distinct. Range:- coastal Alaska to coastal California pictus (Simon), p.108
- 35 (31). Epigynum with conspicuous raised ridge along mesal margins of lateral lobes. Median lobe of epigynum round, large, and obvious kamelus (Ch. and Ivie), p. 81
- Epigynum lacking conspicuous ridge along mesal margins of lateral lobes. Median lobe of epigynum small, slightly longer than wide gertschi, new species, p. 74
- 36 (30). Posterior lobe of epigynum longer than wide 37
- Posterior lobe of epigynum wider than long 38
- 37 (36). Posterior lobe of epigynum very small, vestigial, bullet-shaped; AME smaller than PME; median lobe of epigynum distinctly longer than wide tamarus (Ch. and Ivie), p. 84
- Posterior lobe of epigynum not vestigial; AME larger than PME; PME about two or three diameters of one PME apart pictus (Simon), p.108
- 38 (36). AME smaller than PME. Range:- Sierra Nevada region sierra, new species, p. 77
- AME larger than PME. Epigynum as in Figs. nomeus (Chamb.), p. 95
- 39 (24). Metatarsi I and II each with three or four spines near base below 40
- Metatarsi I and II each with one or two spines near base below 52
- 40 (39). Posterior lobe of epigynum as wide as long 41
- Posterior lobe of epigynum longer than wide, vestigial ... 46

- 41 (40). Median lobe of epigynum distinctly longer than wide 42
- Median lobe of epigynum as long as wide or slightly longer than wide 44
- 42 (41). Median lobe of epigynum about 0.33 times as wide as lateral lobe. Range:- San Francisco County south to Monterey County olympus (Ch. and Ivie), p.101
- Median lobe of epigynum about 0.50 times as wide as lateral lobe. Range:- northern California, possibly southern Oregon 43
- 43 (42). Median lobe of epigynum tear-shaped, clearly about two times as long as wide manzanita, new species, p. 38
- Median lobe of epigynum ovoid, at most about 1.5 times as long as wide panther, new species, p. 41
- 44 (41). Median lobe of epigynum distinctly more than half as wide as lateral lobe. Range:- Montana west to Washington and Oregon, north to British Columbia enus (Ch. and Ivie), p. 70
- Median lobe of epigynum about 0.50 times as wide as lateral lobe or less 45
- 45 (44). Range:- central and southern Arizona, western New Mexico, and northern Mexico arizonicus (Ch. and Ivie), p. 48
- Range:- northern Utah west to Pacific coast nevadensis (Simon), p. 89
- 46 (40). Posterior lobe of epigynum vestigial; lateral lobes broadly excavated (dished out) on ectal margins (Figs. 271 - 279); ectal lobes present severus (Simon), p.114
- Not as above 47

- 47 (46). Ectal lobes of epigynum absent; median lobe of epigynum longer than wide; posterior lobe slightly longer than wide. Range:-
Montana west to Washington and Oregon, north to British
Columbia enus (Ch. and Ivie), p. 70
- Not as above 48
- 48 (47). Lateral lobes of epigynum truncate posteriorly (Figs. 198, 200). Range:- northwestern California, possibly southwestern Oregon angelus (Ch. and Ivie), p. 35
- Lateral lobes pointed or rounded posteriorly 49
- 49 (48). Posterior lobe of epigynum distinctly longer than wide (almost two times as long as wide); ectal lobes absent. Range:-
Newfoundland west to Manitoba and Minnesota, south to
Tennessee bennetti (Blackwall), p. 53
- Not as above 50
- 50 (49). Ectal lobes of epigynum large, separated from lateral lobes by deep notch (Fig. 229) deces (Ch. and Ivie), p. 67
- Ectal lobes small, not separated from lateral lobes by deep notch, attached to base of lateral lobes 51
- 51 (50). Posterior lobe of epigynum same size as or smaller than median lobe nevadensis (Simon), p. 89
- Posterior lobe of epigynum larger than median lobe
..... canada (Ch. and Ivie), p. 64
- 52 (39). Median lobe of epigynum distinctly longer than wide with anterior end broader than posterior (Fig. 239) 53
- Median lobe of epigynum round, ovoid, or only slightly longer than wide, or vestigial 61
- 53 (52). AME larger than PME 54

- AME subequal to or smaller than PME 57
- 54 (53). Lateral lobes of epigynum truncate posteriorly (Fig. 200).
 Range:- northwestern California, possibly southwestern Oregon
 angelus (Ch. and Ivie), p. 35
- Lateral lobes rounded or pointed posteriorly 55
- 55 (54). Median lobe of epigynum about 0.33 to 0.40 times as wide as
 lateral lobe 56
- Median lobe of epigynum about 0.50 times as wide as lateral
 lobe. Range:- northern California, possibly southern Oregon
 panther, new species, p. 41
- 56 (55). Range:- San Francisco County south to Monterey County,
 California (Fig. 406) olympus (Ch. and Ivie), p.101
- Range:- northwestern California, possibly southwestern Oregon
 (Fig. 395) paynei, new species, p. 46
- 57 (53). Posterior lobe of epigynum very small or vestigial, longer
 than wide, bullet-shaped, or triangular 58
- Posterior lobe of epigynum triangular or pentagonal, about as
 wide as long 59
- 58 (57). Range:- northwestern California and southwestern Oregon ..
 paynei, new species, p. 46
- Range:- northwestern Oregon and central Idaho
 tamarus (Ch. and Ivie), p. 84
- 59 (57). Median lobe of epigynum tear-shaped, broader anteriorly,
 clearly about two times as long as wide 60
- Median lobe of epigynum ovoid, at most about 1.5 times as long
 as wide; posterior lobe pentagonal.. tehama, new species, p.120

- 60 (59). Range:- northwestern California and southwestern Oregon ..
 paynei, new species, p. 46
- Range:- northern Sierra Nevada to Mount Shasta area (Fig.
 393) manzanita, new species, p. 38
- 61 (52). Posterior lobe of epigynum distinctly longer than wide ... 62
- Posterior lobe of epigynum about as long as wide, wider than
 long, or vestigial 65
- 62 (61). Posterior lobe of epigynum about twice as long as wide,
 triangular pauculus, new species, p.107
- Posterior lobe of epigynum at most about 1.5 times as long as
 wide 63
- 63 (62). Ectal lobes of epigynum present nevadensis (Simon), p. 89
- Ectal lobes of epigynum absent 64
- 64 (63). Median lobe of epigynum vestigial
 arizonicus (Ch. and Ivie), p. 48
- Median lobe of epigynum large, about 0.5 to 0.6 times as wide
 as lateral lobe rothi, new species, p.104
- 65 (61). Posterior lobe of epigynum vestigial 66
- Posterior lobe of epigynum large and distinct 67
- 66 (65). Lateral lobes of epigynum broadly excavated (dished out) on
 ectal margins (Figs. 271 - 279) severus (Simon), p.114
- Lateral lobes of epigynum not excavated on ectal margins .
 nevadensis (Simon), p. 89
- 67 (65). Epigynum with ectal lobes separated from lateral lobes by deep
 notch (Fig. 229) deces (Ch. and Ivie), p. 67
- Epigynum lacking ectal lobes, or ectal lobes very small and
 indistinct 68

- 68 (67). Posterior lobe of epigynum wider than long 69
- Posterior lobe of epigynum about as wide as long, or only very slightly longer than wide 70
- 69 (68). Lateral lobes of epigynum about 1.5 times as wide at widest point as long; posterior lobe pentagonal
..... klamath, new species, p. 87
- Lateral lobes of epigynum about twice as wide at widest point as long; posterior lobe triangular . nevadensis (Simon), p. 89
- 70 (68). Median lobe of epigynum small or vestigial, at most about 0.33 times as wide as lateral lobe paynei, new species, p. 46
- Median lobe of epigynum about 0.40 times or more as wide as lateral lobe 71
- 71 (70). Range:- Arizona, western New Mexico, and northern Mexico .
..... arizonicus (Ch. and Ivie), p. 48
- Range not as above 72
- 72 (71). Range:- Montana west to Washington and Oregon, north to British Columbia enus (Ch. and Ivie), p. 70
- Range:- northwestern California (Tehama-Mendocino-Trinity County area) paskenta, new species, p. 44

Callobius angelus (Chamberlin and Ivie)

(Figs. 15 - 18, 198 - 201, 392)

Amaurobius angelus Chamberlin and Ivie, 1947b:33.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: "Los Angeles, California. W 118°:N 34°"

No further data.

Amaurobius angelus: Vogel, 1967:17.

Callobius angelus: Chamberlin, 1947:6. Roewer, 1954:1364. Lehtinen, 1967:220.

DIAGNOSIS

The presently known range is the northwest part of California. It is possible that specimens of this species will be found in southwest Oregon, but not likely, as other closely related species, C. klamath and C. paynei, replace it in southwestern Oregon. See key and drawings for other diagnostic features.

DESCRIPTION

Male. Color. Carapace pale golden yellow, slightly darker in cephalic region. Legs about same color as carapace. Palpi same color as legs except for light to dark brown tibiae and tibial spurs. Chelicerae brown. Endites of palpi and labium pale brown. Sternum colored as legs. Opisthosoma pale gray. Dorsum with chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about nine to twelve mm. Carapace about 1.4 times as long as wide. AME about a diameter of one AME apart. ALE larger than AME. AME slightly larger than PME. See key for other features.

Female. Color. Carapace golden brown in thoracic region, dark brown-red in cephalic region. Legs about same color as thoracic part of carapace. Palpi same color as legs, except for darker tibiae and tarsi.

Chelicerae dark brown red. Endites of palpi and labium almost same color as chelicerae. Sternum about same color as thoracic part of carapace.

Structure. Total length about nine to fifteen mm. Carapace about 1.40 to 1.45 times as long as wide. AME about a diameter of one AME apart. ALE larger than AME. AME slightly larger than PME. See key for other features.

FIELD NOTES

Specimens of this species were collected in oak leaf litter, and under rotten logs, bark, and stones on the ground. Females with eggs were collected at Redwood Summit, 20 Miles E. of Willow Creek, Humboldt County, California, on August 9, 1968. Three egg sacs contained the following: 130 eggs; 129 spiderlings and one unfertilized egg; and 208 spiderlings and three unfertilized eggs. Seven immature males of this species were collected on August 9, 1968, and emerged as adults between September 8 and 22, 1968.

One female specimen of this species contains a mermithid (Nematoda) worm in its opisthosoma. The epigynum is deformed.

REMARKS

The female is described and figured here for the first time.

The holotype label of this species reads, "Los Angeles, Calif.". This locality record is questioned. Wilton Ivie (in litt., June 17, 1969) wrote to me that, "There are many specimens in collections

labeled 'Los Angeles' which evidently were not collected there --- more likely just sent out from there. In the absence of specific data or other confirming evidence, such locality records should be questioned."

MATERIAL EXAMINED

Holotype ♂; 7 ♂♂; 24 ♀♀; 2 immatures.

DISTRIBUTION

Humboldt and Mendocino Counties, California (Fig. 392).

RECORDS

CALIFORNIA: Humboldt County: 8 Miles E. of Bridgeville, 2500 ft. alt. (RL); 10 Miles E. Bridgeville (AMNH); 9 Miles E. Carlotta (AMNH); Carlotta (AMNH); 10 Miles W. Willow Creek (AMNH); Horse Mtn, 15 Miles S.W. Willow Creek, 4950 ft. alt. (RL); Redwood Creek, 17 Miles W. of Willow Creek, 960 ft. alt. (RL); Redwood Summit, 20 Miles W. of Willow Creek, 2262 ft. alt. (RL) (AMNH); Mendocino County: Piercy (AMNH).

Callobius manzanita Leech, new species

(Figs. 19 - 23, 202 - 205, 393)

Callobius manzanita Leech, new species.

HOLOTYPE: Male, CNC.

TYPE LOCALITY: CALIFORNIA: Shasta County: 2 Mi. N.E. of Manzanita Lake, Lassen Volcanic National Park. 6150 ft. alt. Collected 8.VIII. 1968 as penultimate male, emerged 24.VIII. 1968 as adult male. R.E.

and A.V. Leech. Under logs and under bark on logs.

DIAGNOSIS

The extremely long, angular mesal spur and the smaller spur or ridge below the dorsal spur serve to distinguish the male members of this species from those of all other species of the genus Callobius. See also key and figures for other features.

DESCRIPTION

Male. Color. Carapace uniformly orange. Legs same color as or slightly paler than carapace. Palpi, except for darker tibiae, same color as legs. Chelicerae orange. Endites of palpi and labium about same color as legs. Sternum slightly paler than legs. Opisthosoma gray. Dorsum marked anteriorly with pale spots, posteriorly with chevrons.

Structure. Total length about seven to nine mm. Carapace about 1.4 to 1.5 times as long as wide. AME less than diameter of one AME apart. AME smaller than ALE. AME equal to or subequal to PME in size.

Female. Color. Carapace pale orange yellow at posterior margin, darkened gradually to dark red brown at anterior margin. Legs about same color as thoracic region of carapace. Palpi, except for darker tibiae and tarsi, same color as legs. Chelicerae dark red brown. Endites of palpi and labium brown. Dorsum unmarked or very faintly marked with chevrons. Venter unmarked.

Structure. Total length about seven to ten mm.

Carapace about 1.4 to 1.5 times as long as wide. AME slightly less than diameter of one AME apart. AME smaller than ALE. AME equal to or larger than PME in size.

FIELD NOTES

Specimens of this species were found under small logs and pieces of bark on the ground, and under loose bark on large logs (three feet diameter) in coniferous forest. Adult males of this species were collected in August and September. Females were collected from June to October, with August and September as the months during which they are most abundant. Three egg sacs, collected on August 7 and 8, 1968, yielded the following: 176 spiderlings and 2 unfertilized eggs; 93 embryos; 77 embryos and 15 unfertilized eggs.

REMARKS

The name of this species is derived from the Spanish word manzanita, meaning "little apple". This is also part of the name of the type locality.

MATERIAL EXAMINED

Holotype ♂. Paratypes: 7♂♂; 50 ♀♀; 11 immatures.

DISTRIBUTION

Shasta and Siskiyou Counties, California (Fig. 393).

RECORDS

CALIFORNIA: Shasta County: 3 Mi. W. Burney, 3370 ft. alt. (RL); Dickson Flat, Ca. 6.5 Mi. S.E. Dead Horse Summit, N.E. Shasta County (AMNH); Manzanita Lake, Lassen Volc. N.P., 5800 ft. alt. (AMNH); 2 Mi. N.E. Manzanita Lake, Lassen Volc. N.P., 6150 ft. alt. (CNC) (RL); 5 Mi. N. Manzanita Lake, Lassen Volc. N.P. (AMNH); Hatchet Mtn. Summit, 7 Mi. W. Burney, 4368 ft. alt. (RL); Two Bridges Camp Grnd, 17 Mi. S. Hat Creek, 4750 ft. alt. (RL); Viola (CAS); Siskiyou County: Bartle (41° 16'N, 121°50'W) (AMNH); 3 Mi. E. McCloud (AMNH); 6 Mi. S. McCloud (AMNH); Dead Horse Summit, 21 Mi. E. McCloud on Hwy 89, 4535 ft. alt. (AMNH) (RL); Ney Springs, 5 Mi. W. Mt. Shasta (AMNH); Mt. Shasta City (UU).

Callobius panther Leech, new species

(Figs. 24 - 25, 206 - 208, 394)

Callobius panther Leech, new species.

HOLOTYPE: Male, CNC.

TYPE LOCALITY: CALIFORNIA: Siskiyou County: Everrit Memorial Road on Mt. Shasta at 6520 ft. alt. Collected on 6.VIII. 1968 as penultimate male, emerged as adult on 24.VIII. 1968. R.E. and A.V. Leech. Under conifer log.

DESCRIPTION

Male. Color. Carapace uniform orange yellow. Legs same color as carapace or slightly paler. Palpi, except for darker tibiae, same color as legs. Chelicerae about same color as carapace or slightly

darker. Endites of palpi and labium slightly darker than legs. Sternum about same color as legs. Opisthosoma gray. Dorsum indistinctly marked with pale spots. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about eight to ten mm. Carapace about 1.35 to 1.45 times as long as wide. AME less than diameter of one AME apart. AME smaller than ALE. AME larger than PME.

Female. Color. Carapace orange at posterior margin, darkening to red brown at anterior margin. Legs about same color as thoracic region of carapace. Femora and patellae of palpi about same color as thoracic region of carapace, tibiae and tarsi about same color as cephalic region of carapace. Chelicerae dark brown red. Endites of palpi and labium brown. Sternum about same color as legs. Opisthosoma gray or gray brown. Dorsum with indistinct pale spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about nine to thirteen mm. Carapace about 1.45 to 1.5 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME larger than PME.

FIELD NOTES

Specimens of this species were collected in old rotten conifer logs, under loose bark of old conifer logs, and under logs. Adult males of this species were collected near the type locality in mid September. Penultimate males reared to adult emerged from late August to December. Females were collected during August and September. Five egg sacs

collected at or near the type locality on August 6, 1968, yielded the following: 135 embryos and six unfertilized eggs; 97 eggs and embryos; 88 spiderlings and two unfertilized eggs; 67 embryos.

REMARKS

This species seems to be restricted to Mt. Shasta and the immediate vicinity. It is closely related to C. angelus, C. manzanita, C. paynei and C. paskenta. The name for this species is derived from the word panther, or mountain lion (Felis concolor).

MATERIAL EXAMINED

Holotype ♂; 5 ♂♂; 27 ♀♀; 14 immatures.

DISTRIBUTION

Mt. Shasta and vicinity in northern California (Fig. 394).

RECORDS

CALIFORNIA: Siskiyou County: Panther Meadows, Mt. Shasta, 7600 ft. alt. (RL); Everrit Memorial Road, Mt. Shasta, 7000 ft. alt. (AMNH); Everrit Memorial Road, 6520 ft. alt. (AMNH) (CNC) (RL); 7 Mi. E. McCloud, 3570 ft. alt. (RL).

Callobius paskenta Leech, new species

(Figs. 26 - 27, 209 - 210, 394)

Callobius paskenta Leech, new species

HOLOTYPE: Male, CNC.

TYPE LOCALITY: CALIFORNIA: Tehama County: Covelo-Paskenta Road,
25 Air Miles East of Covelo on Forest Service Road
23N69, 1/2 Mile South from Road 23N02. 5300 ft.
alt. Collected as penultimate male on 9.VIII.1968,
emerged as adult 8.IX.1968. F.O. Leech. Under logs
and bark.

DESCRIPTION

Male. Color. Carapace uniformly yellow orange. Legs slightly paler than carapace. Palpi, except for darker tibiae, same color as legs. Chelicerae brown orange, slightly darker than carapace. Endites of palpi and labium pale brown. Sternum same color as legs. Opisthosoma gray. Dorsum with very indistinct pale spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length 9.5 mm. Carapace 1.45 times as long as wide. AME less than diameter of one AME apart. AME smaller than ALE. AME larger than PME.

Female. Color. Carapace orange at posterior margin, darkening to dark red brown at anterior margin. Legs about same color as thoracic region of carapace. Femora and patellae of palpi same color as legs. Tibiae and tarsi same colors as anterior region of carapace. Chelicerae

dark brown red. Endites of palpi and labium brown. Sternum pale brown, darker than legs, but not so dark as labium. Opisthosoma gray. Dorsum unmarked or with very indistinct pale spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about ten to twelve mm. Carapace about 1.45 to 1.55 times as long as wide. AME less than diameter of one AME apart. AME smaller than ALE. AME same size as or smaller than PME.

FIELD NOTES

Specimens of this species were collected under loose bark on conifer logs, and under logs. The single known male of this species was collected in August as an immature, and matured in early September. Females were collected in early August. Some immatures collected in August matured in early September.

REMARKS

The name for this species is derived from the Wintun Indian word paskenti, meaning under the bank. The females of this species are very similar to those of C. angelus.

MATERIAL EXAMINED

Holotype ♂; 4 ♀♀.

DISTRIBUTION AND RECORDS

Known only from the type locality (Fig. 394).

Callobius paynei Leech, new species

(Figs. 28 - 29, 211 - 215, 395)

Callobius paynei Leech, new species.

HOLOTYPE: Male, UU type collection in AMNH.

TYPE LOCALITY: OREGON: Josephine County: 3 Miles East of Wilderville. 29.V.1948. Roth and Brown. (Vial contains holotype ♂ and 3 paratype ♀♀.)

DESCRIPTION

Male. Color. Carapace uniform orange. Legs slightly paler than carapace. Palpi, except for darker tibiae, same color as legs. Chelicerae slightly darker orange than carapace. Endites of palpi, labium, and sternum about same color as legs. Opisthosoma gray. Dorsum with two pairs of pale spots anteriorly, chevrons posteriorly. Venter unmarked or with two pale stripes posterior to book lung openings.

Structure. Total length about eight to ten mm. Carapace about 1.25 to 1.5 times as long as wide. AME about diameter or less of one AME apart. AME smaller than ALE. AME larger than PME.

Female. Color. Carapace orange at posterior margin darkening slightly to orange brown at anterior margin. Legs about same color as posterior margin of carapace. Femora and patellae of palpi same color as legs, tibiae and tarsi same color as anterior margin of carapace. Chelicerae red brown. Endites of palpi and labium brown. Sternum same color as or slightly darker than legs. Opisthosoma gray. Dorsum unmarked or with two pairs of indistinct pale spots anteriorly, chevrons

posteriorly. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about eight to fifteen mm. Carapace about 1.4 to 1.6 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME larger than PME.

FIELD NOTES

The males of this species were collected in May and October. Females were collected from April to September. Specimens of this species were found in logs (in Crater National Park).

REMARKS

This species is named after the late Mr. Thomas Payne, my father-in-law - trapper, prospector, philosopher, and arctic explorer - whose financial assistance made possible the purchase of books for my library and numerous small field trips to collect specimens. The median lobe of the epigynum on some females of this species is so small that it appears to be lacking, and in others it is very large.

MATERIAL EXAMINED

Holotype ♂; 2 ♂♂; 50 ♀♀; 14 immatures.

DISTRIBUTION

Southwestern Oregon and northwestern California (Fig. 395).

RECORDS

CALIFORNIA: Siskiyou County: 18 Mi. N. Happy Camp (AMNH); Scott Bar (AMNH).

OREGON: Curry County: 12 Mi. N.E. Gold Beach (AMNH); 8 Mi. E. Gold Beach on Rogue River (AMNH); 12 Mi. E. Gold Beach (AMNH); Rogue River, 3 Mi. Above Illahe (AMNH); Jackson County: Lithia Park, Ashland (AMNH); Ashland summit (AMNH); 12 Mi. N.E. Ashland (AMNH); McAllister Soda Springs (AMNH); Siskiyou (AMNH); Table Rock, nr Medford (AMNH); Josephine County: Grants Pass (AMNH) (UU); 11 Mi. N. Grants Pass (AMNH); Grave Creek (approx. 14 Mi. N. Grants Pass) (AMNH); Oregon Caves National Monument (HEF) (AMNH); Sunny Valley (AMNH); 3 Mi. E. Wilderville (UU); Klamath County: Crater Lake Trail, Crater Lake National Park (AMNH).

Callobius arizonicus (Chamberlin and Ivie)

(Figs. 30 - 32, 216 - 223, 396)

Amaurobius arizonicus Chamberlin and Ivie, 1947b:34.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: ARIZONA: White Mountains, 17 Mi. N.E. Whiteriver.

July 8 - 10, 1940. Gertsch and Hook colls.

Amaurobius arizonicus:Vogel, 1967:17.

Callobius arizonicus:Chamberlin, 1947:6. Roewer, 1954:1364. Lehtinen, 1967:220.

Amaurobius catalinus Chamberlin and Ivie, 1947b:38.

HOLOTYPE: Female, AMNH. Seen.

TYPE LOCALITY: ARIZONA: Pima County: Soldier Camp, Bear Wallow,
Santa Catalina Mountains. 8100 ft. alt. July 12 -
17, 1916. Frank E. Lutz. NEW SYNONYMY.

Amaurobius catalinus:Vogel, 1967:17.

Callobius catalinus:Chamberlin, 1947:7. Roewer, 1954:1365. Lehtinen,
1967:220.

DIAGNOSIS

The males of C. arizonicus are similar to those of C. bennetti, but are distinguished from C. bennetti males as C. arizonicus males have two midventral distal spines on Metatarsi I and II, whereas C. bennetti males have only one midventral distal spine. See also key and drawings. Some females of C. arizonicus resemble those of C. bennetti, others those of C. nevadensis and C. severus.

DESCRIPTION

Male. Color. Carapace uniformly pale orange brown. Legs paler than carapace, yellow orange. Pedipalpi, except for brown tibiae, same color as legs. Chelicerae orange brown, slightly darker than carapace. Endites of pedipalpi and labium about same color as carapace. Sternum same color as legs. Opisthosoma pale gray. Dorsum with two large pale spots on anterior half, chevrons on posterior half. Venter with two stripes posterior to book lung openings.

Structure. Total length from eight to ten mm. Carapace about 1.4 times as long as wide. AME slightly less than diameter of one AME apart. ALE larger than AME. AME same size or slightly smaller than PME. See key for other features.

Female. Color. Carapace color various from orange brown at posterior margin of carapace to red brown in ocular region. Legs same color as posterior thoracic region of carapace. Palpi, except for darker tarsi, same color as legs. Endites of palpi and labium same color as ocular area of carapace. Sternum slightly darker than legs. Opisthosoma pale to dark gray, or brown. Dorsum of some specimens with folium and/or chevrons, others lacking markings. Venter lacking markings.

Structure. Total length about seven to eighteen mm. Carapace about 1.5 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME slightly smaller than PME. See key for other features.

FIELD NOTES

Specimens were collected under small stones (up to about 12 inches across and three or four inches thick) and in oak-pine leaf litter and coniferous leaf litter on cooler north-facing slopes. Males and females are found during each season of the year. Four egg sacs from the Chiricahua Mountains, Cochise County, collected on June 28, 1967, at 9000 feet altitude, yielded an average of 98 eggs, and two cyclorrhaphous Diptera egg predators or parasites. Specimens were collected above 6000 feet altitude and in forested, mountainous areas. Males were collected in February, April, May, August and September.

REMARKS

The male is described and figured here for the first time. Populations of this species are isolated from each other on the mountain ranges of south central and eastern Arizona. Little variation was found between males from each mountain range, whereas tremendous variation was found among females from within each mountain range (see Figs. 216 - 223). Wide variation of epigynal shape between females in any one species in the genus Callobius is a common occurrence, particularly in those species from western North America.

MATERIAL EXAMINED

Holotype ♀; holotype ♀ Amaurobius catalinus; 15 ♂♂; 241 ♀♀; 284 immatures.

DISTRIBUTION

Central and southeastern Arizona, western New Mexico, and northern Mexico (Fig. 396). One vial labelled "nr. Ranger Station, Mt. Lemmon, Santa Catalina Mts., Ariz. July 12 - 15, 1940 Gertsch and Hook", and a second reading as above except for "Bear Wallow, Santa Catalina Mts.,..." are doubtful records, as Gertsch and Hook were in the White Mountains during this time.

RECORDS

UNITED STATES

ARIZONA: Apache County: 17 Mi. N.E. Whiteriver, White Mtns (AMNH); Cochise County: Barfoot Meadow, Chiricahua Mtns (AMNH); Barfoot Park, Chiricahua Mtns, 8100 ft. alt. (JAB); Echo Park, Chiricahua National

Monument (AMNH); 1 Mi. S. Long Park, Chiricahua Mtns (AMNH); Round Park, Chiricahua Mtns (AMNH); Rustler Park, Chiricahua Mtns (AMNH); Head of Carr Canyon, Huachuca Mtns (AMNH); 1 Mi. S. Montezuma Pass, Huachuca Mtns (AMNH); Miller Canyon, Huachuca Mtns (AMNH); 3 Mi. W. Portal (AMNH); Ramsey Canyon, Huachuca Mtns (RL); Coconino County: Oak Creek Canyon (= Oak Grove Canyon?) (AMNH); Gila County: Pinal Peak, 7850 ft. alt. (MCZ); Top of Pinal Mtns (AMNH); Graham County: Mt. Graham, nr. Safford (AMNH); Mt. Graham, 7400 ft. alt. (AMNH); Pinecrest, Graham Mtns (AMNH); Shannon Forest Camp, Graham Mtns (AMNH); Wet Canyon Forest Camp, Graham Mtns (AMNH); Greenlee County: Campbell Blue River, Hwy 666, 7700 ft. alt. (RL); Hwy 666, 9.1 Mi. S. Hannegan Meadow, 8500 ft. alt. (RL); Hwy 666, 10.8 Mi. S. Hannegan Meadow, 7500 ft. alt. (RL); Hwy 666, 22.2 Mi. S. Hannegan Meadow, 7620 ft. alt. (RL); Pima County: Bear Canyon, Santa Catalina Mtns (RL); Bear Wallow, Santa Catalina Mtns, 7900 ft. alt. (AMNH) (JAB); Marshall Gulch, Santa Catalina Mtns, 7500 ft. alt. (JAB); Mt. Bigelow, Santa Catalina Mtns, 8000 ft. alt. (AMNH); Mt. Lemmon, Santa Catalina Mtns, 7800 ft. alt. (AMNH); Mt. Lemmon, Santa Catalina Mtns, 9100 ft. alt. (JAB); Rose Lake, Santa Catalina Mtns, 6800 ft. alt. (JAB); Sabino Canyon, Santa Catalina Mtns (AMNH); 1 Mi. by road above San Pedro Vista, Santa Catalina Mtns, 7850 ft. alt. (JAB); nr. Ski Lodge, Santa Catalina Mtns, 8300 ft. alt. (JAB); Summer Haven, Santa Catalina Mtns (AMNH); Sykes Knob, Santa Catalina Mtns, 8000 ft. alt. (JAB); Upper Sabina Canyon, Santa Catalina Mtns, 7500 ft. alt. (JAB); White House Canyon, Santa Rita Mtns (AMNH); Santa Cruz County: Santa Rita Mtns (AMNH).

NEW MEXICO: Grant County: Iron Creek Campground, 15.5 Mi. N.E. San Lorenzo, 7300 ft. alt. (RL); Rock Creek Camp, Mimbres Mtns (32°50'N,

107°47'W) (UU); Socorro County: 27 Mi. S.E. Magdalena at Langmuir Lab, on E. slopes Mt. Baldy, 10,200 - 10,400 ft. alt. (RL).

MEXICO

CHIHUAHUA: Sierra del Nido, 29°47'N, 106°30'W (AMNH); Arroyo del Alamo, Sierra del Nido, 29°20'N, 106°50'W (AMNH).

Callobius bennetti (Blackwall)

(Figs. 33 - 35, 224 - 226, 396)

Ciniflo bennetti Blackwall, 1846:41.

HOLOTYPE: Female, OU.

TYPE LOCALITY: "Vicinity of Toronto, Ontario, Canada."

Amaurobius sylvestris Emerton, 1888:451.

TYPE SERIES: MCZ, not seen.

TYPE LOCALITY: "All over New England. In White Mountains up to highest trees."

Amaurobius sylvestris:Emerton, 1918:95.

Amaurobius bennetti:Marx, 1890:510. Emerton, 1919:324 (in part). 1928:

46. Kurata, 1943:9. Muma, 1943:33. Chamberlin and Ivie, 1947b:35. Kaston, 1948:516. 1955:172.

Bonnet, 1955:276.

Callobius bennetti:Chamberlin, 1947:7. Hackman, 1954:10, 43. Roewer, 1954:1364. Lehtinen, 1967:220. Vogel, 1967:16.

DIAGNOSIS

Range is restricted to the eastern half of North America. The males of C. bennetti are similar to those of C. arizonicus. The males

of these two species can be distinguished from one another as C. bennetti males have only one midventral distal spine each on Metatarsi I and II, whereas C. arizonicus males have two ventral distal spines (see key).

Callobius nomeus and C. bennetti are known from eastern North America. All specimens belonging to the genus Callobius, particularly those collected at higher altitudes and/or northern latitudes, should be examined carefully, as specimens of these two species have similar color patterns and are about the same size.

DESCRIPTION

Male. Color. Carapace light golden yellow. Cephalic region of carapace usually with dusky reticulations or mottling. Legs slightly paler than carapace. Palpi same as legs, except for light brown tibiae. Chelicerae about same as carapace. Endites of palpi, labium, and sternum dusky yellow. Opisthosoma pale tan to dark grey black. Dorsum antero-medially with central pale stripe flanked by two paler stripes, postero-medially with chevrons (sometimes indistinct) (see Fig. 224). Venter usually marked with four pale, irregular stripes, though sometimes markings indistinct.

Structure. Total length about five to nine mm. Carapace approximately 1.4 times as long as wide. AME about diameter of one AME apart. ALE larger than AME. AME and PME subequal in size. See key for other features.

Female. Color. Carapace light chestnut brown, slightly darker in cephalic region. Dusky reticulations or mottling lacking in cephalic region. Legs light golden yellow, darkened slightly on metatarsi and tarsi in some specimens. Palpi as legs except for brown tibiae. Chelicerae dark red brown. Sternum slightly browner than coxae. Endites of palpi and labium brown. Opisthosoma pale tan to dark grey black. Dorsum often with markings indistinct or lacking. Venter markings indistinct.

Structure. Total length from five to twelve mm. Carapace about 1.45 times as long as wide. AME less than diameter of one AME apart. ALE larger than AME. AME slightly larger than PME. See key for other features.

FIELD NOTES

Females and egg sacs were collected in Algonquin Provincial Park, Ontario, on July 10, 1965. Three egg sacs contained 108, 138, and 152 eggs respectively. Two egg sacs from Douglas Lake, Cheboygan Co., Michigan, dated July 16, 1930, contained an average of 125 eggs each. One egg sac from Minaki, Ontario, dated July 23, 1931, contained 166 eggs. The egg sac is made of soft, flocculent, white silk, covered with bits of debris. Eggs were found under loose bark on standing birch trees and under logs. Kaston (1948:517) found females and egg sacs attached under stones and leaves on the ground. Mature females have been taken at all seasons. Throughout the range, most males have been taken in May, but they have been found as early as February (Vista, Westchester Co., N.Y.) and as late as October (Minneapolis, Minnesota).

REMARKS

Neither of the previous revisions involving this species (Chamberlin and Ivie, 1947b; Chamberlin, 1947) mentioned that the holotype was seen, nor where it was located. When I inquired of the holotype at the Hope Museum, Oxford, Cooke (in litt., 17 December, 1968) replied, "... I have not yet found anything in the dried material that appears to me to be from the Blackwall collections.". Later, when I reported to Cooke that I had found a female specimen of this species in the collection borrowed from the University of Utah, labelled "Oxford U., Eng.", he replied (in litt., 1 February, 1969), "In the circumstances I would be inclined to treat the specimen you have as type material ...". The late Dr. R.V. Chamberlin was in England in 1938 (W. Ivie, in litt., 3 March, 1969), and it is possible that he borrowed the type from the Hope Museum at that time, although there is no written evidence that Chamberlin visited the Hope Museum (Cooke, in litt., 1 February, 1969). After due consideration, I have labelled the specimen mentioned above as the holotype of this species.

MATERIAL EXAMINED

Holotype ♀; 100 ♂♂; 1029 ♀♀; and 475 immatures. One specimen, a female, labelled "Denver, Colorado, 5.IV.1928, W.G. Dietz", is a doubtful record, as much of the Dietz collection is poorly labelled. Dietz used a numbering system for his collection. A vial containing the specimen also contained a small piece of paper with a number printed on it. The number then was entered in a locality data index book with the locality and other data. I have seen this book (borrowed from the

Philadelphia Academy of Natural Sciences) and it leaves much to be desired. Most of the labels are unreadable; many are inaccurate.

DISTRIBUTION

Newfoundland west to Manitoba, perhaps to Saskatchewan, south east to Tennessee, perhaps into northern Georgia and Alabama (Fig. 396).

RECORDS

CANADA

MANITOBA: Birtle (MCZ).

NEW BRUNSWICK: Fredricton (ROM) (FFF); Green River Station, Madawaska County (FFF); St. Andrews (ROM).

NEWFOUNDLAND: Barred Island (MCZ); Bay of Islands (AMNH); Bay St. George (AMNH); Deer Lake (MCZ); Gander Airport (ZMUH); Grandy Brook, Burgeo (ZMUH); Homer's Cove (MCZ); Humber River (MCZ).

NOVA SCOTIA: Halifax (AMNH); Hertford Island, Cape Breton Island (MCZ); Kentville (CNC); North Sydney, Cape Breton Island (MCZ); Truro (UU).

ONTARIO: Ancaster (CNC); Anchor Park, York Co. (ROM); Batchawana (AMNH); 10 Mi. N.E. Belleville (ROM); Black Sturgeon Lake, nr. Hurkett (CNC); Brockville (ROM); Buck Island (Alexandria Bay, Jefferson Co., N.Y.) (MCZ); Cache Lake, Algonquin Prov. Park (ROM); Carnarvon-Haliburton (ROM); Cedar Lake, Algonquin Prov. Park (ROM); Coney Island, Lake Abitibi (ROM); Chaffey's Locks (ROM); Chatterton, nr. Belleville (CNC); Deer Island, Lake Opeongo, Algonquin Prov. Park (CNC); De Grassi Pt (ROM); Don Valley, Toronto (ROM); Elmbrook, Prince Edward Co. (ROM); Elmhurst Beach, York Co. (ROM); Etobicoke, York Co. (ROM); Frank's Bay, Lake Nipigon (ROM); Georgian Bay-Thunder Bay (MCZ); Goward (AMNH);

Grimsthorp, Manitoulin Island (ROM); Haliburton (AMNH); Hallard Lake, Algonquin Prov. Park (ROM); Head Lake, Algonquin Prov. Park (ROM); Holst Point, Minaki (ROM); Honey Harbour, Georgian Bay (ROM); Hornings Mills, Dufferin Co. (ROM); W. of Iron Bridge, Algoma Dist. (MCZ); Island 1024, Lake Timagami (AMNH); Junction of Albany and Kenogami Rivers (51°06'N, 84°28'W) (RL); Kagawong, Manitoulin Island (ROM); Kendal (ROM); Keswick (ROM); Klotz Lake, 25 Mi. E. Longlac (MCZ); Klotz Lake, 30 Mi. E. Longlac (MCZ); Lac Seul (CNC); Lake on the Mountain, Prince Edward Co. (ROM); Latchford, Timiskaming Dist. (ROM); 4 Mi. W. Lanark (RL); Leeds, Tar Island, Rockport (MCZ); Lowell River, Timagami (ROM); Macdiarmid (ROM); Marten R., 36 Mi. N. North Bay (MCZ); Mindemoya, Manitoulin Island (ROM); Moira R., nr. Latta, Hastings Co. (CNC); Newburg, Lennox and Addington Co. (ROM); Nipigon (CNC) (AMNH) (ROM); Normandale (CNC); 2 and 1/2 Mi. N.E. Orchard, Lake Simcoe (ROM); Orillia (ROM); Ottawa (CNC) (MCZ); Pelee Island, Lake Erie (AMNH); Pinehurst Island, St. Lawrence R. (ROM); Pointe au Baril (CU) (RL); Poplar Island, Kesagami L. (ROM); Point Pelee (ROM); Point W. Ko-Ko-Ko Bay, Lake Timagami (ROM); Port Credit (AMNH) (ROM) (UU); Pottageville, York Co. (ROM); Rainbow Falls Prov. Park (DEB); Ridge Road, Prince Edward Co. (ROM); Sandford (CU); Sandstone L., Port Arthur (ROM); Seine R., nr Fort Francis (CNC); St. Catherines (ROM); Silver Inlet, Thunder Bay District (ROM); Singhampton (ROM); Sioux Lookout (ROM); Six Nations Reserve, nr Brantford (CNC); Smoke Lake, Algonquin Prov. Park (ROM); Smoky Falls (CNC) (ROM); Southampton (CNC); South Bay, Manitoulin Island (ROM); South Tea Lake, Algonquin Prov. Park (UU); Spring Bay, Manitoulin Island (ROM); Sproule Bay, Lake Opeongo, Algonquin Prov. Park (AMNH) (ROM) (UU); Square Bay, Manitoulin Island (AMNH); Sturgeon Falls (AMNH);

Swansea (UU); Timagami (ROM); The Rouge, Ontario Co. (ROM); Toronto (ROM); Turkey Point (CNC) (ROM); Wellington (ROM); 3 Mi. N. Wellington (ROM); West Hill, York Co. (ROM) (UU); Whitefish Lake, Manitoulin Island (ROM); York Co. (ROM).

QUÉBEC: Bonaventure, Gaspé (ROM); Baie Ste. Claire, Anticosti Island (CNC); Coffin Island, Iles de la Madeleine (MCZ); Chelsea (CNC); English Head, Anticosti Island (MCZ); Ellis Bay, Anticosti Island (MCZ); Fort Coulonge (CNC); Godbout, Saguenay (ROM); Great Bird Rock (47°50'N, 61°09'W) (MCZ); Lake Mistassini (CNC); L. Grandes-Piles (AMNH); Riviere du Loup (AMNH); Rouville, North Hill, Mont St. Hilaire (MU).

UNITED STATES

CONNECTICUT: Fairfield County: North Stamford (AMNH); Norwalk (AMNH); Sherman (AMNH); Litchfield County: Macedonia Brook (MCZ); New Haven County: East Rock? (MCZ); Bethany Bog, 2 Mi. W. Bethany (AMNH); Hamden (AMNH); Kettletown State Park (AMNH); Middlesex County: East Haddam (AMNH).

ILLINOIS: Cook County: Chicago (MCZ); Willow Springs (CMNH); Tazewell County: Tremont (CMNH).

INDIANA: La Porte County: Smith (AMNH); Lawrence County: Smith Woods, N.E. of Springville (CMNH); Parke County: "Devils Den", Annapolis (AMNH); Turkey Run State Park (AMNH) (CMNH); Porter County: nr Suman (CMNH); Indiana (CU).

IOWA: Between Mongona (Clayton Co.) and Boone (Boone Co.) (UU); Clayton County: Guttenberg (MCZ).

MAINE: Aroostook County: Caribou (MCZ); Cumberland County: Lake Sebago (AMNH); Hancock County: "Hancock Co." (MCZ); Castine (USNM);

Black Woods Camp, Acadia National Park (MCZ); Mt. Desert Island (AMNH);
 Black Woods Campground, Mt. Desert Island (MCZ); Pond Trail to Bubble
 Pond, Mt. Desert Island (MCZ); The Bowl, Mt. Desert Island (MCZ);

Piscataquis County: nr Chimney Pond, Baxter State Park (MCZ); nr
 Sandy Stream Pond, Baxter State Park (MCZ); Greeley's Lodge (MCZ); Abol
 Trail, Mt. Katahdin (MCZ); Katahdin Stream Camp (MCZ); Roaring Brook
 Campsite, Mt. Katahdin (AMNH); Moosehead Lake (MCZ).

MARYLAND: Allegany County: Rocky Gap Cave, on Evitts Mtn (AMNH); South
 Mtns, nr. Myersville (MCZ).

MASSACHUSETTS: Franklin County: Totem Lookout Trail, Mohawk State
 Forest (MCZ); Middlesex County: Cambridge (MCZ); Lincoln (MCZ); Newton,
 Hammond's Pond (MCZ); Pepperell (MCZ); Norfolk County: Chickatawbut,
 Blue Hills (MCZ); Dedham (MCZ); Deer Island, Boston (MCZ); Forest Hills,
 Boston (MCZ); Worcester County: Harvard Forest nr Petersham (MCZ).
 Undetermined locality: Middlesex Falls (MCZ).

MICHIGAN: Alger County: Grand Marais (MCZ); Allegan County: Saugatuck
 (CMNH); Barrien County: Lakeside-Warren Woods (AMNH); Calhoun County:
 Albion (MCZ); Charlevoix County: 7 Mi. N.E. Charlevoix (MCZ); Thumb
 Lake (MCZ); Cheboygan County: Burt Lake (MCZ); Douglas Lake (MCZ);
 Grapevine Point (MCZ); The Gorge (MCZ); Weimer Lake (MCZ); Chippewa
County: Eckerman (MCZ); Crawford County: Hartwick Pines State Park
 (MCZ); Delta County: Hiawatha National Forest (MCZ); Emmet County: Bay-
 view (MCZ); 5 Mi. E. Bayview (MCZ); Cecil's Bay (MCZ); nr Cross Valley
 (MCZ); Cross Village (MCZ); Menonaqua (MCZ); Menonaqua, nr Bay View
 (MCZ); Gladwin County (MCZ); Hillsdale County: Mosherville (MCZ); Iosco
County: Silver Creek (MCZ); East Tower, Silver Creek Ranger Station
 (AMNH); Iron County: Caspian, Stanley, and Chicagoan Lakes (MCZ);

Keweenaw County: Isle Royale (DEB) (MCZ); Lapeer County (MCZ); Luce County: Deer Park (MCZ); Marquette County: Negaunee (MCZ); Midland County (MCZ); Oceana County: Stoney Lake, nr Shelby (MCZ); Ogemaw County (MCZ); Ontonagon County: Porcupine Mtns State Park (MCZ).

MINNESOTA: Anoka County: Itasca State Park (AMNH); Freeborn County: Albert Lea, Helmar Myre State Park (MCZ); Hennepin County: Minneapolis (AMNH); Lake Minnetonka (AMNH); Goodhue County: Wacouta Beach, Lake Repin (AMNH); Wiwona County: John Latsch State Park, nr Minnellska (MCZ); White Water State Park, nr Elba (MCZ).

NEW HAMPSHIRE: Carroll County: Intervale (MCZ); Cheshire County: Fitzwilliam (MCZ); 5 Mi. W. Fitzwilliam (MCZ); Jaffrey (MCZ); Surry (MCZ); Coos County: Gorham (AMNH); Moose Brook, 3 Mi. W. Gorham (MCZ); Mt. Washington (MCZ); Randolph (AMNH) (MCZ); Tuckerman Ravine (MCZ); Grafton County: Franconia Notch (MCZ); Franconia (MCZ); The Flume, White Mountains (AMNH) (MCZ); Mt. Garfield (UU). Undetermined localities: "Northern New Hampshire" (CU); and Squaw Lake (UU).

NEW JERSEY: Bergen County: Alpine (AMNH); Palisades (AMNH); Ramapo River, nr. Mahwah (AMNH); Passaic County: Wanaque, Midvale (AMNH); Sussex County: Stockholm (AMNH); Warren County: Delaware Water Gap State Park, nr. Strassburg (AMNH).

NEW YORK: Bronx County: Grassy Sprain, Yonkers (AMNH); Catteraugus County: Rock City (CU); Chautaugua County: Stow (CU); Columbia County: Lake Charlotte (CU); Dutchess County: Hyde Park (MCZ); Essex County: Keene Valley (AMNH); Mt. Marcy (AMNH); Trout Pond (CU); Uphill Brook and Opalescent River (CU); Wilmington Notch (CU); Franklin County: Chateaugay Lake, Adirondack Mtns (MCZ); Fish Pond Creek (CU); Greene County: Lanesville (AMNH); Livingston County: Letchworth Park? (AMNH);

Monroe County: Mendon Ponds (MCZ); Scottsville (AMNH); Nassau County: Sea Cliff (MCZ); New York County: New York City (AMNH); Oneida County: Trenton Falls (MCZ); Onondaga County: Jamesville Rocks (AMNH); Pompey (AMNH); Orange County: Bear Mtn (AMNH); Bear-Harriman Mtn State Park (AMNH); Cornwall (CU); Cuddebackville (AMNH); Sterling Forest (AMNH); Ontario County: Canadaigua, L. Woodville (AMNH); Rensselaer County: Huych Preserve, Rensselaerville (AMNH); Rensselaerville (AMNH); Rockland County: Sterlington (UU); St. Lawrence County: Big Tupper Lake (MCZ); Tioga County: Spencer (CU); Steuben County: Lake Kauka (CU); Savona (CU); Wallace (UU); Suffolk County: Cold Spring Harbor (AMNH); Sullivan County: Oakland Valley (CU); South Fallsbury (AMNH); "Sullivan County" (MCZ); Tompkins County: Danby (CU); Ithaca (AMNH) (CU) (MCZ) (UU); McLean (CU); Taughannock Falls (CU); Ulster County: Ashokan (41°58'N, 74°12'W) (AMNH); Chichester (AMNH); Cragmoor (CU); Washington County: Juanita Island, Lake George (CU); Peal Point, Lake George (CU); Westchester County: Larchmont (CU); Salem Center (AMNH); Vista (AMNH); Undetermined localities: Michigan Mills (CU); Powder Mills (AMNH); Slaterville (Springs?) (CU).

NORTH CAROLINA: Buncombe County: Asherville (MCZ); Swannanoa (MCZ);

Macon County: Highlands (JEC) (CNC).

OHIO: Hocking County: Cantwell Cliffs State Park, Rockbridge (UU) (WAS); Conckles Hollow State Park (WAS); Rockbridge (OSU); Rockhouse (UU); Ottawa County: Put-in-Bay, S. Bass Island, Lake Erie (UU).

PENNSYLVANIA: Crawford County: Hartstown (AMNH); Erie County: Presque Isle (AMNH); Forest County: Horseshoe Bend, Neshaminy Creek, N.E. of Jamison (AMNH); McKean County: Ludlow (AMNH); Northumberland County: Mt. Carmel (MCZ); Pike County: Milford (AMNH); Potter County: Couder-

sport (WAS); Ice Mtn Swamp (WAS); 7 Mi. S. Ladona (WAS); Ole Bull State Park (WAS); Moore's Run, Costello (WAS); Union County: R.B. Winter State Park (WAS).

TENNESSEE: Sevier County: Great Smoky Mtns, Little Pidgeon Creek (UU); Mt. Leconte (AMNH) (CMNH); Trillium Gap (AMNH); Unicoi County: Erwin (UU); Washington County: Roan Mtn, 10 Mi. S.E. of Johnson (MCZ).

VERMONT: Caledonia County: North Danville (MCZ); Chittenden County: W. Side Mt. Mansfield (MCZ); Lamoille County: Stowe (AMNH); Rutland County: Pittsford (AMNH); Washington County: Marshfield (MCZ); Windham County: Townshend (MCZ); Westminster West (AMNH).

VIRGINIA: Carroll County: Fancy Gap, 1000 m. alt. (MCZ); Fairfax County: Falls Church (MCZ); Floyd County: Rocky Knob (MCZ); Grayson County: Galax (JEC); Elk Wallow, Shenandoah National Park (AMNH); Mary's Rock, Shenandoah National Park (AMNH); Matthews Arm, Shenandoah National Park (MCZ).

WEST VIRGINIA: McCowell County: Kimball (AMNH); Pendleton County: Spruce Knot, 5 Mi. W. of Judy Gap (AMNH); Pocahontas County: Cranberry Glades National Area (WAS); Randolph County: Gaudineer Knob, 2 Mi. E. of Chert Bridge (AMNH); Summers County: Blue Stone State Park (WAS); Tucker County: Davis (MCZ).

WISCONSIN: Adams County: Dells (MCZ); Bayfield County: Bellevue Lake (CMNH); Chippewa County: Brunat Island State Park (MCZ); Clark County: Worden Township (CMNH); Columbia County: The Dells Kilburn (AMNH); Door County: Ephraim (CMNH); Potawatomi State Park (MCZ); Douglas County: Cedar Island, Brule (MCZ); Pattison State Park (MCZ); Fond du Lac County: (Mautke?) Lake (MCZ); Forest County: Alvin (MCZ); Grant County: Platteville (MCZ); Wyalwing State Park (MCZ); Iron County: Kimball (UU);

La Crosse County: Loon Valley, Timber Coolee (MCZ); Lincoln County:
 Corning (MCZ); Manitowoc County: Point Beach State Park (AMNH);
Marathon County: Eau Pleine Res. (MCZ); Monroe County: Coon Valley
 (MCZ); Oneida County: Camp Tesoma, nr Rhinelander (MCZ); Price County:
 Hemlock Mem. Grove (MCZ); Sauk County: Baxter's Hollow (MCZ); Devil's
 Lake (CMNH); Shawano County: Keshena (MCZ); Vernon County: Coon Valley
 (MCZ); Vilas County: Sayner-Lost Lake (CMNH); Walworth County: Lake
 Geneva, Wynchwood (CMNH).

Callobius canada (Chamberlin and Ivie)

(Figs. 36 - 37, 227 - 228, 397)

Amaurobius canada Chamberlin and Ivie, 1947:36.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: BRITISH COLUMBIA: Salmon Arm. May, 1940. Olive R.
 Leech coll.

Amaurobius canada:Turnbull, 1952:2. Vogel, 1967:17.

Callobius canada:Chamberlin, 1947:7. Roewer, 1954:1364. Thorn, 1967:14.
 Lehtinen, 1967:220.

DESCRIPTION

Male. Color. Carapace dirty orange brown. Cephalic region with dusky mottling from ocular area to thoracic groove. Thoracic region marked laterally with three pairs wedge-shaped dusky mottling. Legs about same color as carapace, but with dusky streaks, particularly on femora. Palpi, except for brown tibiae, same color as legs. Chelicerae with dusky mottling, and about same color as legs. Sternum slightly

darker than carapace. Opisthosoma pale to dark gray. Dorsum unmarked or with pale spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about eight to ten mm. Carapace about 1.35 to 1.4 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME about same size as PME. See key for other features.

Female. Color. Carapace orange brown, slightly darker in cephalic region than in thoracic region. Legs slightly paler than carapace. Palpi, except for brownish tibiae and tarsi, same color as legs. Chelicerae dark red brown. Endites of palpi and labium slightly paler than chelicerae. Sternum about same color as legs. Opisthosoma pale to dark gray. Dorsum various from unmarked or marked with pale spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about eight to fifteen mm. Carapace proportions various from 1.25 to 1.5 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME about same size as or smaller than PME. See key and figures for other features.

FIELD NOTES

One vial from Parkdale, Hood River County, Oregon, dated 24.VII. 1954, contained an egg sac with 129 eggs. Males were collected at the type locality in May and October.

REMARKS

Most of the localities for this species are damp, wooded areas with large Douglas fir trees. The name of the collector of the type material is Olive R. Leech, not as written on the label, "Olive D. Leech".

MATERIAL EXAMINED

Holotype ♂; two ♂♂; 23 ♀♀; nine immatures.

DISTRIBUTION

Lower British Columbia, Montana, Washington, and Oregon (Fig. 397).

RECORDS

BRITISH COLUMBIA: Cawston-Yale (ROM); Salmon Arm (AMNH) (KABC); Selkirk Mts, Head of Sawmill Creek, W. of Wycliffe (AMNH); Fountain Valley (CNC).

MONTANA: Flathead County: La Salle (AMNH); Glacier National Park (HEF).

OREGON: Jefferson County: Warm Springs (AMNH); Multnomah County: Multnomah (AMNH); Wasco County: The Dalles (AMNH); Hood River County: Parkdale (AMNH).

WASHINGTON: Chelan County: 16 Mi. N.W. Leavenworth (AMNH); Douglas County: Orondo (UU); 5 Mi. W. Waterville (AMNH); Kittitas County: Cle Elum (AMNH) (HEF).

Callobius deces (Chamberlin and Ivie)

(Figs. 38 - 39, 229 - 230, 400)

Amaurobius deces Chamberlin and Ivie, 1947b:40.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: OREGON: Lane County; Coburg Hills; 3 Mi. N.E.

Coburg. March 22, 1942. B. Malkin and H. Stobie.

Amaurobius deces:Vogel, 1967:17.

Callobius deces:Chamberlin, 1947:7. Roewer, 1954:1365. Lehtinen, 1967:
220.

DIAGNOSIS

The pointed, obliquely-truncate dorsal spur on the male palpi, and the large ectal lobes on the epigynum of the female distinguish the members of this species from the members of most other species in the genus Callobius. See key and figures.

DESCRIPTION

Male. Color. Carapace orange brown with dusky mottling mostly in cephalic region, but in some specimens mottling scattered throughout thoracic region. Legs about same color as carapace, with dusky streaks. Palpi slightly darker than legs. Endites of palpi and labium about same color as palpi. Sternum dirty brown, darker than endites and labium. Opisthosoma dark gray. Dorsum with two pale spots on anterior half, chevrons on posterior half. Venter with two or four stripes between epigastric furrow and spinnerets.

Structure. Total length about seven to ten mm. Carapace about 1.35 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME equal or subequal in size to PME. See key and figures for other features.

Female. Color. Carapace orange brown at posterior margin, darkening to dark red or brown in cephalic region. Legs about same color as posterior margin of carapace. Palpi, except for dark tibiae and tarsi, same color as legs. Chelicerae dark red or red brown. Endites of palpi and labium about same color as cephalic region of carapace. Sternum slightly darker and browner than legs. Opisthosoma gray or pale brown. Dorsum with pale spots on anterior half, chevrons on posterior half. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about six to fifteen mm. Carapace about 1.5 to 1.6 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME slightly larger than PME. See key and figures for other features.

FIELD NOTES

Specimens of this species have been collected under bark of rotten oak, in oak leaves and moss, under bark on rotten Douglas fir, under bark on ground, and inside rotten logs on the ground. Three females with eggs were found at Willamette Pass Summit, Klamath County, Oregon, on July 17, 1968, inside rotten conifer logs. These egg sacs contained the following: 225 spiderlings and two unfertilized eggs; 145 spiderlings and 8 unfertilized eggs; 108 spiderlings and 17 unfertilized eggs. Males were collected from January to April.

REMARKS

One vial labelled HOLOTYPE Callobius deces C. and I., from 5 Mi. S. of Forest Grove, Oregon, November 28, 1945, Wilton Ivie Collector, is not the holotype of this species, but is one of the paratypes (see Chamberlin and Ivie, 1947b:42).

MATERIAL EXAMINED

Holotype ♂; 20 ♂♂; 205 ♀♀; 100 immatures.

DISTRIBUTION

Washington, Oregon, and California (Fig. 400).

RECORDS

CALIFORNIA: Contra Costa County: Mt. Diablo (AMNH); Siskiyou County: Middle Fork of Smith River (41°51'N, 123°55'W) (AMNH).
 OREGON: Benton County: Colorado Lake, Corvallis (AMNH); Corvallis (AMNH) (HEF) (UU); 8 Mi. N. Corvallis (AMNH); 2 Mi. N. Corvallis (UU); 5 Mi. S.E. Monroe (AMNH); Philomath (UU); 5 Mi. S. Philomath (AMNH);
Clackamas County: 4 Mi. W. Carver (UU); Estacada (UU); Columbia County: Scappoose (AMNH); Douglas County: Anlauf (AMNH); Bogus Cr. For. Camp, 32 Mi. E. Roseburg (AMNH); 10 Mi. N.W. Diamond Lake (AMNH); Glide (UU); Idlewild Park, North Umpqua (AMNH); Jackson County: Huckleberry Mtn, 5500 ft. alt. (AMNH); 5 Mi. W. Jacksonville (UU); Prospect (AMNH); Union Creek (AMNH); Klamath County: Williamette Pass Summit on Hwy 58, 5130 ft. alt. (AMNH) (RL); Lane County: Belknap Spgs (AMNH); Coburg Hills, 3 Mi. N.E. Coburg (UU) (AMNH); Eugene (AMNH); 5 Mi. S. Eugene (AMNH); Fern

Ridge Dam (AMNH); McCredie Spgs (AMNH); Spencer Butte, nr Eugene (AMNH); Springfield (AMNH); Willamette Pass Summit (AMNH); Linn County: 1 and 3/4 Mi. W. Sweet Home (UU); 16 Mi. N.E. Sweet Home on Road to Quartzville (UU); Marion County: Salem (UU); Multnomah County: MacLeay Park, Portland (AMNH); Portland (AMNH) (HEF) (MCZ); Tillamook County: Netarts (AMNH); Washington County: 5 Mi. S. Forest Grove (UU); Forest Grove (UU); Yamhill County: Dayton (AMNH); McMinnville (AMNH); Peavine Ridge, nr. McMinnville (AMNH).

WASHINGTON: Douglas County: Cypress Island (MCZ); Cowlitz County: Kalama (UU); King County: Seattle (AMNH) (HEF); Pierce County: Ft. Lewis (CAS); Thurston County: Olympia (HEF) (MCZ).

Callobius enus (Chamberlin and Ivie)

(Figs. 40 - 42, 231 - 234, 398)

Amaurobius enus Chamberlin and Ivie, 1947b:42.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: 44°55'N, 116°04'W. Idaho, Valley County, N.E.

McCall. May 31, 1944. Wilton Ivie collector.

Amaurobius enus:Vogel, 1967:17.

Callobius enus:Chamberlin, 1947:7. Roewer, 1954:1365. Lehtinen, 1967:

220.

DESCRIPTION

Male. Color. Carapace orange brown with dusky mottling, particularly in cephalic region. Thoracic region of some specimens also with some dusky mottling. Legs slightly paler than carapace, with dusky

streaking on ventral sides of femora. Palpi, except for brown tibiae, same color as legs. Chelicerae with dusky mottling, about same color as carapace. Endites of palpi, labium about same color as legs, or slightly darker. Sternum darker than endites and labium. Opisthosoma dark gray. Dorsum unmarked on most specimens, but few with pale spots. Venter with two or four pale stripes between epigastric furrow and spinnerets.

Structure. Total length about seven to ten mm. Carapace about 1.40 to 1.45 times as long as wide. AME slightly less than diameter of one AME apart. AME smaller than ALE. AME slightly larger than PME. See key and figures for other features.

Female. Color. Carapace orange, pale in thoracic region, darkening to red in cephalic region. Dusky mottling lacking. Legs paler than carapace. Palpi, except for darker tibiae and tarsi, about same color as legs. Chelicerae dark red. Endites of palpi and labium brown. Sternum about same color as legs. Opisthosoma gray or gray brown. Dorsum marked with pale spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about nine to twelve mm. Carapace about 1.45 to 1.6 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME equal to or larger in size than PME. See key and figures for other features.

FIELD NOTES

This species has been collected under bark and rocks on the ground in Douglas fir forests. One female collected at 39 Mi. N.E.

Lowell, Clearwater County, Idaho, on July 30, 1968, was eating a specimen of the carabid beetle, Metrius explodans Goulet. The egg sac from this female was covered with the remains of other Metrius explodans specimens. The egg sac contained 98 spiderlings and three unfertilized eggs. Another egg sac from 18 Mi. W. Lolo, Missoula County, Montana, collected on July 30, 1968, contained seven eggs and an ichneumonid parasite (Helmitelini, probably Gelis sp.). Males were collected in January, April and May.

REMARKS

Chamberlin and Ivie recorded the holotype locality as: 44°56'N, 116°02'W. Idaho: 3 Miles N.E. of McCall. May 31, 1944. However, the label in the vial with the holotype male and two paratype females reads: 44°55'N, 116°04'W. Idaho: N.E. McCall. May 31, 1944. Wilton Ivie collector. None of the paratype material before me has the locality "3 Mi. N.E. McCall", but there are three vials containing the following information:

1. 44°56'N, 116°02'W Idaho: 4 Mi. N.E. McCall October 18, 1944	2. 44°56'N, 116°02'W Idaho: Payette Lake (hill on east side) July 5, 1943 Wilton Ivie collector
3. 44°56'N, 116°02'W Idaho: 4 Mi. N.E. McCall Collected on April 28, matured May 8, 1945. Wilton Ivie collector.	

MATERIAL EXAMINED

Holotype♂; 12 ♂♂; 110 ♀♀; 43 immatures.

DISTRIBUTION

Montana, Idaho, British Columbia, Washington, and Oregon (Fig. 398).

RECORDS

BRITISH COLUMBIA: Invermere, 8000 ft. alt. (KABC); Nelson (ROM); Selkirk Mtns, Head of Sawmill Creek W. of Wycliffe, 6050 ft. alt. (AMNH); Summerland (CNC).

IDAHO: Adams County: Lost Lake (reservoir, about 15 Mi. N. Council) (AMNH); Blaine County: Big Wood River, 19 Mi. N. Ketchum, 43°45'N, 114°30'W (UU); Warm Springs Creek, 8 Mi. W. Ketchum, 43°38'N, 114°30'W (UU); Pierce (AMNH); Custer County: Stanley Lake, Sawtooth Mtns, 7500 ft. alt. (AMNH); Idaho County: Hwy 12, 39 Mi. N.E. Lowell, 2860 ft. alt. (RL); Latah County: Moscow Mtns (MCZ); Moscow Mtns, Moscow (AMNH); Troy (MCZ); Viola Ridge, 1 Mi. N. Moscow (AMNH); Lemhi County: Top Anderson Mtn, 8000 ft. alt., Salmon Nat. For. (AMNH); Valley County: Evergreen Camp, Upper Weiser River, 44°52'N, 116°22'W (UU); 4 Mi. N.E. McCall (UU); Payette Lake (hill on east side) (UU); Smiths Ferry, 44°18'N, 116°05'W (UU).

MONTANA: Flathead County: Big Fork (MCZ); Glacier N.P. (HEF); Glacier N.P., nr. Lake McDonald Hotel (MCZ); Glacier N.P., North Fork Rd at Kintla Creek, 3900 ft. alt. (AMNH); Granite County: Moose Lake (AMNH); Rock Creek Rec. Area, Lolo Nat. For., Kitchen Gulch (AMNH); Sleeping Child, Hamilton (AMNH); Mineral County: Lolo Nat. For., Petty Creek, E. of Alberton (AMNH); St. Regis (AMNH); Missoula County: 18 Mi. W. Lolo, 3900 ft. alt. (RL); Sanders County: Mount Hedley, Cabinet Nat. For.

(AMNH); Thompson Falls (AMNH).

OREGON: Benton County: 12 Mi. S. Corvallis (AMNH); Hood River County:
Perham Creek (UU); Wasco County: Hood River (CU); Mosier (UU).

WASHINGTON: Chelan County: Leavenworth (HEF); Spokane County:
Spokane (MCZ); Stevens County: Caedar Lake, 48°55'N, 117°36'W (AMNH);
Cedar Lake, N. Leadpoint, 48°55'N, 117°35'W (AMNH); Whitman County:
Wawawai, nr. Pullman (MCZ).

Callobius gertschi Leech, new species

(Figs. 43 - 45, 235 - 237, 399)

Callobius gertschi Leech, new species.

HOLOTYPE: Male, CNC.

TYPE LOCALITY: CALIFORNIA: Shasta County: Hwy 89, just N. of
Summit of Lassen Peak, Lassen Volc. N.P. 8200 ft.
alt. 8.VIII.1968, emerged about 20.VIII.1968 as
adult male. R.E. Leech. Collected in rotten
conifer logs.

DIAGNOSIS

The blunt, uniformly-thick mesal spur on the palpal tibiae and the peculiar median apophysis of males of this species distinguish them from males of all other species in the genus Callobius, except for C. sierra. The differences observable between males of the species C. gertschi and C. sierra are slight (see Figs. 43 - 48). The females of these two species are easily distinguishable one from the other (see Figs. 235 - 239).

DESCRIPTION

Male. Color. Carapace uniformly orange. Legs slightly paler than carapace. Palpi, except for orange brown tibiae, same color as legs. Chelicerae about same color as carapace. Endites of palpi, labium and sternum about same color, slightly paler than legs. Opisthosoma gray. Dorsum with pale spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about seven to ten mm. Carapace about 1.35 to 1.5 times as long as wide. AME slightly less than diameter of one AME apart. AME smaller than ALE. AME about same size as or smaller than PME. See key and figures for other features.

Female. Color. Carapace pale orange at posterior margin intergrading to dark orange brown in cephalic region. Legs about same color as posterior margin of carapace. Palpi, except for darker tarsi, same color as legs. Chelicerae dark red brown. Endites of palpi and labium brown, slightly paler than chelicerae. Sternum about same color as legs. Opisthosoma gray to gray brown. Dorsum with pale spots anteriorly and chevrons posteriorly. Venter unmarked.

FIELD NOTES

Specimens of this species were collected in old, rotten conifer logs and stumps, and under loose bark on conifer logs. Two egg sacs, collected with the females at Yuba Pass Summit, 7 Mi. W. Sattley, Sierra County, California, on August 15, 1968, at 6700 feet altitude, yielded the following: 126 spiderlings with one unfertilized egg, and 85

spiderlings with one unfertilized egg. Males were collected during August and September.

REMARKS

The holotype of this species is slightly teneral, but it is in perfect condition as it was reared from the penultimate instar, and comes from an ideal locality - the road summit of Lassen Volcanic National Park. This species is named after Dr. Willis J. Gertsch, who has collected many of the specimens used in this study.

MATERIAL EXAMINED

Holotype ♂; four ♂♂; 17 ♀♀; eight immatures.

DISTRIBUTION

Northern Sierra Nevada, California, to southern Cascade Range, California (approximately Mt. Lassen to Sierra County) (Fig. 399).

RECORDS

CALIFORNIA: Shasta County: Lassen Volcanic National Park, Summit Lake, 6000 ft. alt., (MCZ); Lassen Volcanic National Park, 7000 ft. alt., (AMNH); Hwy 89, just N. of Summit of Lassen Peak, Lassen Volcanic National Park, 8200 ft. alt., (CNC); Sierra County: Yuba Pass Summit, 7 Mi. W. Sattley, 6700 ft. alt., (RL); Monarch Mine, Sierra City (AMNH).

Callobius sierra Leech, new species

(Figs. 46 - 48, 238 - 239, 399)

Callobius sierra Leech, new species.

HOLOTYPE: Male, CNC.

TYPE LOCALITY: NEVADA: Washoe County: Mt. Rose, 1.5 Miles West of
Top of Pass on Rte. 27. 8550 ft. alt. 27.VIII.1969.
Frances O. Leech. Under Pinus logs. (Mesal process
of left palpus broken off.)

DIAGNOSIS

The blunt, almost uniformly-thick mesal spur on the palpal tibiae and the peculiar median apophysis of males of this species readily distinguish the members of this species from the members of all other species in the genus Callobius, except for C. gertschi. The differences observable between the males of these two species are slight. The female members of these two species are easily distinguishable one from the other. See figures and key.

DESCRIPTION

Male. Color. Carapace uniform pale yellow. Legs very slightly paler than carapace. Femora and patellae of palpi same color as legs, tibiae slightly darker than carapace. Chelicerae slightly darker than carapace, about same color as palpal tibiae. Endites of palpi and labium very pale brown. Sternum pale yellow, slightly paler than legs. Opisthosoma very pale gray. Dorsum with two pale spots anteriorly, chevrons posteriorly. Venter unmarked.

Structure. Total length 7.1 mm. Carapace 1.48 times as long as wide. AME almost two diameters of one AME apart. AME about half the size of ALE. AME smaller than PME.

Female. Color. Carapace pale yellow in thoracic region, darkening to orange in cephalic region. Legs about same color as thoracic region of carapace. Femora, patellae, and tibiae of palpi same color as legs, tarsi same color as cephalic region of carapace. Chelicerae dark brown. Endites of palpi and labium light brown. Sternum almost same color as legs above. Opisthosoma pale gray brown or gray. Dorsum unmarked or with pale spots anteriorly, chevrons posteriorly. Venter unmarked.

Structure. Total length about eight to twelve mm. Carapace about 1.45 to 1.55 times as long as wide. AME slightly more than diameter of one AME apart. AME smaller than ALE. AME smaller than PME.

FIELD NOTES

Members of this species were collected under rotten pine logs, and in rotten pine logs. The only male known for this species was collected on August 27, 1969. Females were collected from middle to late August. Two egg sacs, collected at or near the type locality in mid August, 1968, contained 50 and 18 spiderlings.

REMARKS

As the left palpal tibia of the male holotype was damaged, the figure of the palpal tibia for this species was made from the right

tibia, then reversed. The original and the reversed figures are included. The median apophysis was drawn from the left palpal organ. The name for this species is derived from the Spanish word sierra, meaning range of mountains.

MATERIAL EXAMINED

Holotype ♂; 13 ♀♀; 6 immatures.

DISTRIBUTION

Known only from Washoe County, Nevada (Fig. 399).

RECORDS

NEVADA: Washoe County: Mt. Rose, 1.5 Mi. W. Top of Pass, on Rte. 27, 8550 ft. alt. (CNC) (RL); Hwy 27, 19 Mi. S.W. Tahoe Junction, 8400 ft. alt. (RL); 14 Mi. S.W. Tahoe Junction, at Mt. Rose Ski Lodge, 8020 ft. alt. (RL); Hunter Lake, Hunter Canyon, 8 Mi. S.W. Reno, 6500 ft. alt. (UN).

Callobius hyonassus Leech, new species

(Figs. 240 - 241, 402)

Callobius hyonassus Leech, new species.

HOLOTYPE: Female, CNC.

TYPE LOCALITY: OREGON: Grant County: Strawberry Creek Camp Ground, 11 Miles South of Prairie City. 5800 ft. alt.
3.VIII.1968. R.E. Leech. In rotten logs and under bark of rotten pine logs.

DIAGNOSIS

The peculiar, sculptured, posterior margin of the epigynum readily distinguishes the known specimen of this species from the members of all other species in the genus Callobius (see Figs. 240 - 241).

DESCRIPTION

Male. Unknown.

Female. Color. Carapace pale orange yellow in thoracic region, dark brown in cephalic region. Legs darkening slightly distally, but about same color as thoracic region of carapace. Palpi, except for darker tibiae and tarsi, same color as legs. Chelicerae dark brown red. Endites of palpi and labium brown. Sternum slightly darker than legs. Opisthosoma gray. Dorsum with distinct white marks anteriorly, and chevrons posteriorly. Venter unmarked.

Structure. Total length 9.8 mm. Carapace 4.6 mm long, 3.2 mm wide (1.44 times as long as wide). AME less than diameter of one AME apart. AME smaller than ALE. AME slightly larger than PME. See key and figures for other features.

FIELD NOTES

The holotype was collected on a north-facing, well-shaded slope in rotten pine logs and under bark of rotten pine logs. The single egg sac, collected with the holotype, contained 101 spiderlings and two unfertilized eggs. Specimens of Callobius nomeus were very abundant at

this collecting site in the same habitat.

REMARKS

The name of this species is derived from the Greek hyos, meaning pig, and the Latin nasus, meaning nose, referring to the remarkable similarity that the epigynum bears to a pig's nose.

MATERIAL EXAMINED

Holotype ♀.

Callobius kamelus (Chamberlin and Ivie)

(Figs. 49 - 51, 242 - 243, 403)

Amaurobius kamelus Chamberlin and Ivie, 1947b:44.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: OREGON: Umatilla County: Meacham Lake, 2 Miles

S.W. of Meacham, Blue Mountains. 3910 ft. alt.

July 4, 1938. Wilton Ivie, collector.

Amaurobius kamelus:Vogel, 1967:17.

Callobius kamelus:Chamberlin, 1947:8. Roewer, 1954:1365. Lehtinen, 1967:220.

DIAGNOSIS

The peculiar ridges on the mesal margins of the lateral lobes of the epigynum of the females, and the peculiar median apophysis and tibial processes of the males, distinguish the members of this species from those of all other species of the genus Callobius. See also Figs. 49 -

51, 242 - 243.

DESCRIPTION

Male. Color. Carapace pale yellow orange in thoracic region, very slightly darker in cephalic region. Legs about same color as thoracic region of carapace. Palpi about same color as legs. Chelicerae pale orange brown. Endites of palpi and labium slightly darker than legs. Sternum about same color as legs. Opisthosoma gray. Dorsum with three pairs of pale spots anteriorly and chevrons posteriorly. Venter with two or three pale stripes between epigastric furrow and spinnerets.

Structure. Total length about seven to nine mm. Carapace about 1.35 to 1.45 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME smaller than PME. See key and figures for other features.

Female. Color. Carapace pale orange at posterior margin, darkened gradually to orange brown in cephalic region. Legs darkened slightly distally and about same color as thoracic region of carapace. Palpi, except for darker tibiae and tarsi, same color as legs. Chelicerae dark brown. Endites of palpi and labium brown. Sternum slightly darker than legs. Opisthosoma gray or gray brown. Dorsum distinctly or indistinctly marked anteriorly with pale spots, and posteriorly with chevrons. Venter unmarked.

Structure. Total length about nine to twelve mm. Carapace about 1.4 to 1.5 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME smaller than PME. See key and figures for other features.

FIELD NOTES

In 17 egg sacs examined, six parasitic larvae were found (Ichneumonidae: Helmitelini, probably Gelis sp.). One egg sac contained two parasitic larvae. All the eggs were eaten. Four egg sacs collected at or near the type locality on August 1, 1968, contained the following: 115 embryos and five unfertilized eggs; 115 spiderlings and two unfertilized eggs; 62 embryos; and 53 eggs. Six penultimate males collected on August 1, 1968, at or near the type locality, emerged as adult males between August 3 - 9, 1968. Females were found from June to October. At the type locality, specimens were found under stones and bark on the ground near the creek in the cool ravine draining Meacham Lake. Meacham Lake is a man-made reservoir. A couple of adult males of this species were found that had had the palpi broken off at the trochanters, and some were found with only one palpus remaining.

REMARKS

The male of this species is described and figured here for the first time.

MATERIAL EXAMINED

Holotype ♀; seven ♂♂; 41 ♀♀; 22 immatures.

DISTRIBUTION

Northeastern Oregon in the Blue Mountain Area (Baker, Grant, Umatilla, and Union Counties) (Fig. 403).

RECORDS

OREGON: Baker County: Pine Creek, 10 Mi. N.W. Baker (AMNH); 11 Mi. W. North Powder on North Powder River, 4100 ft. alt. (RL); Grant County: Lunch Creek, Dixie Pass, Blue Mountains, 5280 ft. alt. (AMNH); Umatilla County: Meacham Lake, 2 Mi. S.W. Meacham, Blue Mountains, 3910 ft. alt. (AMNH) (RL); 4 Mi. S.E. Meacham on old Kamela-Meacham Road, 4290 ft. alt. (RL); Ukiah (AMNH); Union County: Anton Creek, W. of North Powder (44°59'N, 118°02'W) (AMNH).

Callobius tamarus (Chamberlin and Ivie)

(Figs. 52 - 54, 244 - 245, 404)

Amaurobius tamarus Chamberlin and Ivie, 1947b:54.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: IDAHO: Adams County: Lost Valley Reservoir.

20.VIII.1936. Wilton Ivie, collector. (44°57'N,
116°28'W).

Amaurobius tamarus:Vogel, 1967:18.

Callobius tamarus:Chamberlin, 1947:9. Roewer, 1954:1366. Lehtinen,
1967:220.

DIAGNOSIS

The peculiar median apophysis and palpal tibial processes of the male, and the sharp-edged lateral margins of the lateral lobes of the epigynum of the female readily distinguish the members of this species from all others in the genus Callobius. See also key and figures 52 - 54, 244 - 245.

DESCRIPTION

Male. Color. Carapace uniform orange. Legs slightly paler than carapace. Femora and patellae of palpi same color as legs, tibiae about same color as carapace. Chelicerae slightly darker than carapace. Endites of palpi and labium about same color as legs. Sternum slightly paler than legs. Opisthosoma cream or pale gray. Dorsum with two pale spots anteriorly, chevrons posteriorly. Venter unmarked or with two pale stripes posterior to book lung openings.

Structure. Total length about seven to nine mm. Carapace about 1.3 to 1.37 times as long as wide. AME about diameter or more of one AME apart. AME smaller than ALE. AME smaller than or subequal to PME.

Female. Color. Carapace pale orange in thoracic region, darkening to dark orange in cephalic region. Legs slightly paler than thoracic region of carapace. Femora, patellae, and tibiae about same color as legs, tarsi about same color as cephalic region of carapace. Chelicerae brown red. Endites of palpi and labium brown. Sternum about same color as legs. Opisthosoma pale gray or dark gray. Dorsum marked anteriorly with two lateral pale stripes anteriorly, chevrons posteriorly.

Structure. Total length about seven to fourteen mm. Carapace about 1.4 to 1.5 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME smaller than PME.

FIELD NOTES

Members of this species were found under rocks in thick spruce-fir forests. Males of this species were collected on August 20 and October 17. Females were collected from late May to October. Two egg sacs, collected on July 31, 1968, at Wallowa Lake State Park, Wallowa County, Oregon, contained 114 spiderlings, and 111 spiderlings and two unfertilized eggs.

REMARKS

I have not seen the specimen on which is based a literature record for this species from Wawawai, Whitman County, Washington.

MATERIAL EXAMINED

Holotype ♂; three ♂♂; twelve ♀♀; six immatures.

DISTRIBUTION

Central Idaho, northeast Oregon, and southeast Washington (Fig. 404).

RECORDS

IDAHO: Adams County: 5 Mi. N.E. Council (AMNH); summit 7 Mi. N. Council (UU); Lost Valley Reservoir (AMNH).

OREGON: Grant County: 3 Mi. W. Dixie Pass, Blue Mountains, about 4000 ft. alt. (AMNH); Wallowa County: Wallowa Lake State Park, 6 Mi. S. Joseph, 4500 ft. alt. (RL).

WASHINGTON: Whitman County: Wawawai (specimen not seen).

Callobius klamath Leech, new species

(Figs. 55 - 56, 246 - 247, 407)

Callobius klamath Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: OREGON: Klamath County: 12 Mi. S.W. of Keno in
Klamath River Canyon. March 6, 1960. Joe Schuh.
Under bark.

DESCRIPTION

Male. Color. Carapace uniformly orange. Legs slightly paler than carapace. Palpi, except for darker tibiae, about same color as carapace. Chelicerae dark orange brown. Endites of palpi and labium light brown. Sternum about same color as legs. Opisthosoma gray. Dorsum unmarked. Venter with two pale stripes posterior to book lung openings.

Structure. Total length 9.8 mm. Carapace 4.9 mm long, 3.4 mm wide (1.44 times as long as wide). AME about diameter of one AME apart. AME smaller than ALE. AME same size as PME. See key and figures for other features.

Female. Color. Carapace pale orange yellow at posterior margin, darkening gradually to orange at anterior margin. Legs about same color as posterior margin of carapace. Palpi, except for darker tibiae and tarsi, same color as legs. Chelicerae brown. Endites of palpi and labium pale brown. Sternum slightly darker than legs.

Structure. Total length 9.5 mm. Carapace 4.4 mm long, 2.9 mm wide (1.69 times as long as wide). AME less than diameter of one AME apart. AME smaller than PME. See key and figures for other features.

FIELD NOTES

The female paratype of this species was found on August 5, 1968, in a pine forest where the ground was well-shaded under a large pine log with an egg sac containing 107 eggs.

REMARKS

This species is named after the Klamath Indians, who roamed southern Oregon and northern California. The name is derived from Tlamatl, the Chinook name for a sister tribe of the Modocs who called themselves Maklako, meaning people (Gudde, 1969).

MATERIAL EXAMINED

Holotype ♂; paratype ♀.

DISTRIBUTION

Klamath County, Oregon (Fig. 407).

RECORDS

OREGON: Klamath County: Type locality, and 5 Mi. W. Keno, 3915 ft. alt. (RL).

Callobius nevadensis (Simon)
(Figs. 57 - 58, 248 - 253, 401)

Amaurobius nevadensis Simon, 1884:318.

LECTOTYPE: Here designated. Male, MNHN. Vial with label as follows:

A.S. Nevada: 2528 b.430. In same vial a female.

TYPE LOCALITY: "NEVADA".

Amaurobius nevadensis:Chamberlin and Ivie, 1947b:46. Bonnet, 1955:290.

Amaurobius utahensis Chamberlin, 1919a:239.

HOLOTYPE: Male, MCZ, Type No. 414.

TYPE LOCALITY: UTAH: Millard County: Fillmore.

Amaurobius utahensis:Chamberlin and Ivie, 1947b:46. Bonnet, 1955:296.

Callobius nevadensis:Chamberlin, 1947:8. Roewer, 1954:1365. Lehtinen,
1967:220.

Auximus pallescens Chamberlin, 1919b:3.

HOLOTYPE: Immature female, MCZ, Type No. 376.

TYPE LOCALITY: CALIFORNIA: Los Angeles County: Claremont.

William A. Hilton, collector. NEW SYNONYMY.

Auximus pallescens:Bonnet, 1955:824.

Amaurobius pallescens:Chamberlin and Ivie, 1947b:49.

Callobius pallescens:Chamberlin, 1947:8. Roewer, 1955:1365.

Amaurobius shastus Chamberlin and Ivie, 1947b:53.

HOLOTYPE: Female (location unknown).

TYPE LOCALITY: CALIFORNIA: Siskiyou County: Weed. September 8,
1935. R.V. Chamberlin and Wilton Ivie, collector.

NEW SYNONYMY.

Amaurobius shasta:Vogel, 1967:18.

Callobius shastus:Chamberlin, 1947:9. Roewer, 1954:1366. Lehtinen,
1967:220.

NOTES ON SYNONYMY

The females of nevadensis are variable, and without a large series from many localities, it would have been impossible to make the new synonymies proposed above. Comparison of the holotype of Auximus pallescens with penultimate female instars of Callobius nevadensis shows beyond doubt that nevadensis and pallescens are conspecific, as the eye sizes and arrangement of pallescens are typical of nevadensis specimens. I am in agreement with Chamberlin and Ivie (1947b:46) who synonymized utahensis and nevadensis. The holotype of utahensis was compared with several males of nevadensis and it was found that the palpal tibial processes and median apophysis of the utahensis holotype are identical with those of nevadensis specimens.

The holotype of Amaurobius shastus was unavailable for this study and presumed lost or misplaced in the University of Utah Collection. However, I have seen all the topotypic paratype females of shastus and, except for the fact that they are smaller than the average nevadensis specimens, they are typical in eye sizes and arrangement, leg spination of Metatarsi I and II, and epigynum.

DIAGNOSIS

The males of this species have the largest median apophysis (almost one mm long) known for the species of the genus Callobius.

DESCRIPTION

Male. Color. Carapace uniformly orange, some specimens with slight reddish tinge. Legs slightly paler than carapace. Palpi, except for brown tibiae, same color as legs. Chelicerae same color as carapace. Endites of palpi, labium, and sternum same as legs. Opisthosoma gray or gray brown. Dorsum anteriorly with two large white spots, posteriorly with chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about seven to twelve mm. Carapace about 1.1 to 1.4 times as long as wide. AME less than a diameter of one AME apart. AME same size as or slightly smaller than ALE. AME larger than PME.

Female. Color. Carapace orange in thoracic region, darkened to reddish orange in cephalic region. Smaller specimens (about 8 to 10 mm long) paler than larger specimens (15 to 20 mm long). Legs same color as carapace or slightly darker. Palpi, except for darker tibiae and tarsi, same color as legs. Chelicerae dark brown red. Endites of palpi and labium brown or red brown. Sternum same color as legs or darker. Opisthosoma gray or gray brown. Dorsum unmarked or with pale, indistinct spots and chevrons, rarely with distinct spots and chevrons. Venter unmarked or with two pale stripes posterior to book lung openings.

Structure. Total length about seven to twenty-two mm. Carapace about 1.4 to 1.6 times as long as wide. AME less than a diameter of one AME apart. AME equal in size to or smaller than ALE. AME larger than PME.

FIELD NOTES

Males of this species were collected from March to September. Females were collected during each month of the year. Three egg sacs from Keno, Klamath County, Oregon, collected during August, 1968, yielded the following: 274 spiderlings and 13 unfertilized eggs; 203 spiderlings and 17 unfertilized eggs; 135 spiderlings and five unfertilized eggs. Specimens of this species were collected in rotten conifer logs and under loose bark of large conifer logs.

REMARKS

The date attributed to the paper in which the name Auximus pallescens was published is 1920. However, an advance reprint was issued in August, 1919. Thus the date for the specific epithet is 1919. The regular issue of the journal appeared in March, 1920.

The lectotype and paratype borrowed from the MNHN most closely resemble other specimens of this species from Utah.

The males of this species are very similar to one another throughout the known distribution, but the females, like those of C. arizonicus, vary markedly in size and epigynal structure. Larger specimens are darker and proportionately more heavily built than smaller specimens.

MATERIAL EXAMINED

Lectotype ♂; holotype ♂ Amaurobius utahensis, MCZ Type No. 414; holotype immature ♀ Auximus pallescens, MCZ Type No. 376; 20 ♂♂; 239 ♀♀; 171 immatures.

DISTRIBUTION

Utah west to California, north to Washington and Idaho (Fig. 401).

RECORDS

CALIFORNIA: Amador County: Pine Grove (AMNH); Volcano (CMNH); Calaveras County: Avery (AMNH); Eldorado County: Bliss State Park, Lake Tahoe (AMNH); 6 Mi. E. Camp Connell (AMNH); Echo Summit, 4 Mi. S.W. Meyers, 7382 ft. alt. (AMNH); Fallen Leaf Lake (AMNH); 4 Mi. W. Kyburz (AMNH); Riverton (UU); 3 Mi. W. Riverton (AMNH); Sly Park (AMNH); S.W. Shore Lake Tahoe (AMNH); Fresno County: Cedar Grove, Kings Canyon National Park (AMNH); Cherry Gap, Sierra Nevada (AMNH); Dalton Creek, 4800 ft. alt. (CU); Shaver Lake (AMNH); Lassen County: S. on Pine Creek Road, Pittville (AMNH); Los Angeles County: Glendale (AMNH); Madera County: 5 Mi. S. Fish Camp (AMNH); Mariposa County: Glacier Point, Yosemite National Park, 7200 - 7700 ft. alt. (AMNH); Grouse Creek, Yosemite National Park (AMNH); 6 Mi. S. Mather (AMNH); Mirror Lake, Yosemite Valley, Yosemite National Park (MCZ); Mendocino County: Rockport (AMNH); Mono County: Benton (AMNH); Big Bend Camp Ground, 5 Mi. W. Leevining (AMNH); Monterey County: Pacific Grove (UU); Nevada County: Simon Sugar Bowl Lodge, nr Norden (AMNH); Placer County: Baxter (at Baxter Post Office), 3860 ft. alt. (RL); E. end Bear Valley (CAS); Emigrant Gap (UU); Tahoe City (AMNH); Tahoe, Lake Tahoe (AMNH); Lake Tahoe (MCZ) (AMNH); Plumas County: Chilcoot, 4 Mi. N. on Last Chance Creek (AMNH); Vicinity Soda Springs Cave, 10 Mi. N. Quincy (AMNH); San Francisco County: San Francisco (CAS); Shasta County: Big Springs

(CAS); Dana (AMNH); 5 Mi. N. Manzanita Lake (AMNH); Subway Cave, 1 Mi. N. Old Station (= Hat Creek) (AMNH); Redding (AMNH); Summit Lake, Lassen Volcanic National Park, 6700 ft. alt. (AMNH); Sierra County: 2 Mi. N. Calpine (AMNH); The Cups, Sierra City (AMNH); Siskiyou County: Bray, 21.5 Mi. N.E. Weed (UU); Hotel Rock, Lava Beds National Monument (AMNH); Scott Mtns, nr Callahan (CAS); Ney Springs, 5 Mi. W. Mt. Shasta (AMNH); Sisson (= Shasta City), Mt. Shasta (CAS) (MCZ); Weed (UU); Tulare County: 1 Mi. below Belnap Springs, nr. Camp Nelson (AMNH); Cedar Grove, Kings River Canyon, 4366 ft. alt. (AMNH); Mammoth Lakes, 36°35'N, 119°00'W (AMNH); Quaking Aspen Camp (AMNH); Soda Creek, W. of Camp Nelson (AMNH); Tuolumne County: Aspen Valley, Yosemite National Park (AMNH); Pinecrest (CAS) (AMNH); Tamarack Flat, Yosemite National Park (AMNH); Twainharte (AMNH); Yosemite Valley, 4000 ft. alt. (CAS) (MCZ); Yosemite National Park (AMNH); Yuba County: Strawberry (AMNH).

IDAHO: Bear Lake County: Warm Springs (AMNH); Undetermined Locality: Minidoka National Forest (AMNH); Idaho County: North of Kamiah (AMNH).

NEVADA: Washoe County: Reno (AMNH) (UN) (UU).

OREGON: Deschutes County: Indian Ford, 7 Mi. W. Sisters (AMNH) (UU); Sisters (AMNH); 2 Mi. W. Sisters (AMNH); Jackson County: Pinehurst (AMNH) (UU); Dead Indian Road, 6 Mi. E. Ashland (AMNH); Klamath County: Keno, 4240 ft. alt. (RL); "King Cole", Parker Mtn, on Hwy 66, 29 Mi. W. Keno, 4105 ft. alt. (RL); 16 Mi. S. Ft. Klamath, 4100 ft. alt. (RL); Lane County: 4 Mi. E. Wildwood Camp, Ochoco Forest, S.E. of Cottage Grove (AMNH); Lane and Klamath Counties: Wilamette Pass, 5120 ft. alt. (AMNH).

UTAH: Cache County: Logan (AMNH); Logan Canyon (MCZ); Emery County: Hughes Canyon, Wasatch Mtns (UU); Salt Lake County: Mill Creek Canyon

(UU); Dry Canyon, Salt Lake City (UU); City Creek Canyon, Wasatch Mtns (UU); Rotary Park, City Creek Canyon (UU); Utah County: American Forks Canyon, Wasatch Mtns (UU); Timpanogos Park, American Forks Canyon (AMNH); Weber County: Ogden Canyon (UU).

WASHINGTON: Klikitat County: Klikitat Valley (MCZ).

Undetermined Locality: OREGON: 2 Mi. W. Forest Glen (AMNH).

Callobius nomeus (Chamberlin)

(Figs. 59 - 64, 254 - 258, 405)

Amaurobius nomeus Chamberlin, 1919a:240.

HOLOTYPE: Female, MCZ, Type No. 416.

TYPE LOCALITY: UTAH: Summit County: Chalk Creek, Uinta Mountains. 10,000 ft. alt. August, 1917. R.V. Chamberlin, collector. (40°45'N, 111°03'W).

Amaurobius nomeus: Gertsch and Jellison, 1939:2. Chamberlin and Ivie, 1947b:48. Bonnet, 1955:290.

Callobius nomeus: Chamberlin, 1947:8. Levi and Levi, 1951:234. Roewer, 1954:1365. Levi and Levi, 1955:40. Lehtinen, 1967:220.

Amaurobius tacoma Chamberlin and Ivie, 1947b:54.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: WASHINGTON: Paradise Valley, Mt. Rainier National Park. 5200 - 6700 ft. alt. 10 - 12.VIII.1942. Borys Malkin, collector. (46°47'N, 121°44'W). NEW SYNONYMY.

Amaurobius tacoma: Roewer, 1954:1359.

Callobius tacoma: Lehtinen, 1967:220.

NOTES ON SYNONYMY

Examination of the median apophysis of the holotype of Amaurobius tacoma shows that this specimen is conspecific with the type of nomeus, though the mesal process of the tacoma male is slightly different. Characteristics of females collected at the type locality of tacoma are also typical of nomeus specimens.

DESCRIPTION

Male. Color. Carapace uniformly pale orange with streak of dusky mottling at line delimiting cephalic and thoracic regions. Legs of some specimens with pale gray annulations. Legs slightly paler than carapace. Palpi, except for darker tibiae, same color as legs. Tibiae of palpi same color as carapace or darker. Chelicerae same as carapace or slightly darker. Endites of palpi and labium same as legs. Sternum with dusky markings. Opisthosoma gray or gray brown. Dorsum with two distinct pairs of white spots anteriorly, with chevrons posteriorly. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about eight to nine mm. Carapace about 1.2 to 1.7 times as long as wide. AME about diameter of one AME apart. AME same size as or smaller than ALE. AME larger than PME.

Female. Color. Carapace orange at posterior margin darkening to orange red at anterior margin. Legs about same color as thoracic region of carapace, darkened slightly distally. Legs of some specimens with pale gray annulations. Palpi, except for darker tarsi, same color

as legs. Chelicerae dark red brown. Endites of palpi and labium brown. Sternum about same color as legs distally. Opisthosoma gray or gray brown. Dorsum with distinct white spots anteriorly, chevrons posteriorly. Venter with pale stripes.

Structure. Total length about nine to eleven mm. Carapace about 1.4 to 1.45 times as long as wide. AME slightly less than diameter of one AME apart. AME smaller than ALE. AME larger than PME.

FIELD NOTES

Specimens of this species were collected in standing, rotting, conifer stumps, under loose bark of large rotten conifer logs, in rotten conifer logs, and under stones and logs in damp spruce-fir forests. Males of this species were collected during July and August, with the greatest number collected during August. Females were collected from May to September, with August as the peak month. Eggs and spiderlings in egg sacs were collected during July and August. One egg sac collected on July 12, 1969, at 4200 feet altitude on Mt. Edith Cavell, Jasper National Park, Alberta, contained 41 spiderlings and 18 unfertilized eggs. Four egg sacs collected on August 3, 1968, at 5800 feet altitude at Strawberry Creek Camp Ground, Grant County, Oregon, yielded the following: 87 spiderlings and 27 unfertilized eggs; 67 eggs; 64 eggs; 60 spiderlings and 13 unfertilized eggs. Three other egg sacs from the latter locality contained ichneumonid parasites (Helmitelini, probably Gelis sp.). One penultimate male of this species was collected with an immature female Poecilochroa montana Emerton (Drassidae). The drassid

had just attacked and killed the amaurobiid and was eating it at the time both were collected. This predator-prey relationship was observed at Wallowa Lake State Park, six Miles south of Joseph, Wallowa County, Oregon, on July 31, 1968.

REMARKS

It is curious that Chamberlin (1947) did not include the species Amaurobius tacoma in the genus Callobius when it was erected. The mesal process on some specimens of C. nomeus from Mt. Rainier National Park, Washington, and Skagway, Alaska, is slightly atypical (see Figs. 59, 63). However, male specimens from just east of Mt. Rainier National Park are about half way between typical C. nomeus specimens and the atypical tacoma specimens on Mt. Rainier. The median apophysis, on all specimens of nomeus and tacoma examined, is very similar.

MATERIAL EXAMINED

Holotype ♀, MCZ # 416; paratype ♂; MCZ # 417, from type locality; holotype ♂ Amaurobius tacoma (AMNH); 48 ♂♂; 177 ♀♀; 82 immatures.

DISTRIBUTION

New England north to Labrador, west to British Columbia and Alaska south to Oregon, southeast to Utah and Colorado, north to Idaho and Montana (Fig. 405).

RECORDS

CANADA

ALBERTA: Devil's Lake (58°22'N, 116°48'W) (AMNH); 8 Mi. E. Mt. Edith Cavell Lodge, Mt. Edith Cavell, Jasper National Park, 4210 ft. alt. (RL); Mt. Edith Cavell Road, Mt. Edith Cavell, Jasper National Park, 5700 ft. alt. (RL); Edmonton, 2185 ft. alt. (RL); Jasper, Jasper National Park (MCZ); 8 Mi. W. Jasper, Jasper National Park, 3625 ft. alt. (RL); Lake Louise, Banff National Park (MCZ); Lake Louise, Laggan (= town of Lake Louise) (MCZ); Medicine Lake, Jasper National Park (MCZ); Swan Hills, 4600 ft. alt. (RL).

BRITISH COLUMBIA: Beatton R., 5 Mi. E. Ft. St. John (BCPM); Deka Lake, 35 Mi. E. 100 Mile House, 3600 ft. alt. (RL); Emerald Lake, N.W. Field (MCZ); Eva Lake, Mt. Revelstoke National Park, 6300 ft. alt. (CNC); Ft. St. John (BCPM); Hector, E. end Wapta Lake, Kootenay District (CU); Lower Post to Watson Lake (see Yukon) (CNC); Manning Provincial Park Camp Ground (BCPM) (RL); McLeod Lake, 85 Mi. N. Prince George (BCPM); Paul Lake, 15 Mi. N. Kamloops (BCPM); Pine Pass, 80 Mi. W. Dawson Creek (BCPM); Portage Mountain, Peace River District (RL).

LABRADOR: Goose Bay (CNC) (RL).

QUÉBEC: Jacques Cartier Lake, Laurentides Park (AMNH); Mt. Albert, Gaspesian Park, Gaspé Peninsula (MCZ); Rupert House (CNC); Seven Islands (CNC).

SASKATCHEWAN: Besnard Lake, 55°25'N, 106°00'W (DJB).

YUKON TERRITORY: Lower Post to Watson Lake (see British Columbia) (CNC).

UNITED STATES

ALASKA: Skagway (MCZ).

COLORADO: Archuleta County: Pagosa Springs (AMNH); El Paso County:

Pikes Peak Canyon (AMNH); Gunnison County: Gothic Natural Area, Elk Mountains, 9800 ft. alt. (MCZ); Gothic Natural Area, 10,500 ft. alt. (MCZ); Gothic Natural Area, Elk Mountains, 2900 m (MCZ); Spruce-fir forest below Queen Basin, Copper Creek Valley, Elk Mountains, 10,300 ft. alt. (MCZ); Larimer County: Mummy Range Trail (CU); Park County: Stormy Peaks Trail, Pingree (?), 9 - 10,000 ft. alt. (CU); San Juan County: Silverton, 9800 ft. alt. (MCZ).

IDAHO: Emigration Canyon (AMNH) (location undetermined); Twin Creek Camp Ground, Salmon National Forest, Bitterroot Mountains (AMNH) (location undetermined).

MONTANA: Cut Bank Creek, Glacier National Park, 5100 ft. alt. (MCZ); Cut Bank Creek, Glacier National Park, 5200 ft. alt. (AMNH); Josephine Lake, Glacier National Park, 4800 ft. alt. (AMNH); McDowell Lake, Upper Anaconda Creek, Glacier National Park (HEF); Two Medicine Lake, Glacier National Park, 5200 ft. alt. (MCZ); Gallatin County: Galatine Gateway (= Gallatin Gateway) (UU); Powell County: Big Salmon Lake area, Bob Marshall Wilderness Area (MCZ); Ravalli County: Gird's Creek (AMNH).

NEW HAMPSHIRE: Coos County: Mt. Washington (AMNH) (MCZ).

OREGON: Baker County: Anthony Lakes, Elkhorn Ridge, Blue Mountains, 7060 ft. alt. (RL); Grant County: Beech Creek Camp (AMNH); Lunch Creek, Dixie Pass, 11 Mi. N.E. Prairie City, 5080 ft. alt. (RL); 13 Mi. N.E. Prairie City, 4500 ft. alt. (RL); Strawberry Creek Camp Ground, 11 Mi. S. Prairie City, 5800 ft. alt. (RL); Lane County: Obsidian Trail (AMNH); Wildwood Camp in Ochoco Mountains (AMNH); Umatilla County: Meacham Lake, 2 Mi. S.W. Meacham, 3910 ft. alt. (RL); Wallowa County: Wallowa Lake State Park, 6 Mi. S. Joseph, 4500 ft. alt. (RL); Wallowa Lake, 4750 ft. alt. (AMNH).

UTAH: Duchesne County: Granddaddy Lake Region, Uinta Mountains (AMNH);
 Mirror Lake, Uinta Mountains (40°43'N, 110°53'W) (UU); Iron County:
 Cedar Mountain (UU); Salt Lake County: Mill Creek Canyon, 8 Mi. above
 elbow (UU); Vicinity of Salt Lake City (UU); San Juan County: La Sal
 Pass, 11,000 ft. alt. (AMNH); Sanpete County: Ferron Reservoir, Wasatch
 Plateau (UU); Uintah County: 2 Mi. N. Ouray (38°03'N, 107°41'W) (UU);
Wasatch County: Cobble Rest Camp, Provo River, Uinta Mountains (AMNH).
 WASHINGTON: Lewis County: Mt. Rainier National Park, Paradise River
 Canyon, nr Jctn of Bypass and Visitor Center, 4760 ft. alt. (RL); 2 Mi.
 W. White Pass Summit, 11 Mi. E. Jctn Hwys 12 and 143, 4150 ft. alt.
 (RL); Mt. Rainier National Park (HEF); Stevens County: Cedar Lake
 (48°55'N, 117°36'W) (AMNH).
 WYOMING: Sublette County: Lower Green River Lake, Wind River Range,
 8000 ft. alt. (AMNH); Teton County: Cascade Canyon, Grand Teton
 National Park (AMNH); Mount Baldy, Grand Teton National Park (MCZ);
 Signal Mountain, Moran, Grand Teton National Park (MCZ); Across Snake
 River J.H.B.S., Moran, Grand Teton National Park (AMNH); Yellowstone
 National Park: Bridge Bay, Yellowstone Lake (43°32'N, 110°27'W) (UU);
 Slough Creek (AMNH); Thumb, Yellowstone Lake, 44°24'N, 110°32'W (UU).

Callobius olympus (Chamberlin and Ivie)

(Figs. 65 - 66, 259 - 261, 406)

Amaurobius olympus Chamberlin and Ivie, 1947b:49.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: San Mateo County: Kings Mtn, nr Palo
 Alto. Autumn, 1922. J.C. Chamberlin, collector.

Amaurobius olympus:Vogel, 1967:18.

Callobius olympus:Chamberlin, 1947:8 (in part). Roewer, 1954:1365.

Lehtinen, 1967:220.

DIAGNOSIS

This species is restricted in range to San Francisco, San Mateo, Santa Cruz, and Santa Clara Counties, California. No other species of the genus Callobius is known from this region.

DESCRIPTION

Male. Color. Carapace uniformly orange. Legs same color as carapace. Palpi, same color as carapace. Chelicerae darker, more orange brown than carapace. Endites of palpi and labium slightly darker than legs. Sternum same color as legs. Opisthosoma pale gray. Dorsum with indistinct pale spots anteriorly, chevrons posteriorly. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about eight to eleven mm. Carapace about 1.1 to 1.4 times as long as wide. AME about radius or slightly more of one AME apart. AME smaller than ALE. AME larger than PME.

Female. Color. Carapace orange at posterior margin, darkened to red brown at anterior margin. Legs about same color as thoracic region of carapace. (Some smaller females not darkly colored, but are a pale yellow.) Palpi same color as legs. Chelicerae red brown, slightly darker than anterior margin of carapace. Endites of palpi and labium brown. Sternum same color as legs. Opisthosoma pale or dark

gray. Dorsum unmarked or very indistinctly marked with pale spots anteriorly, chevrons posteriorly. Venter unmarked.

Structure. Total length about eight to fifteen mm. Carapace about 1.45 to 1.55 times as long as wide. AME less than diameter of one AME apart. AME smaller than ALE. AME larger than PME.

FIELD NOTES

A specimen of this species was found on grassy ground near woods. The only males known for this species were collected in the autumn or late September. Females of this species were collected throughout the year, but mostly in September.

REMARKS

One specimen of this species bears the label, "CALIFORNIA: Los Angeles. June.", but this locality is in doubt (see Callobius angelus).

MATERIAL EXAMINED

Holotype♂; two♂♂; 108 ♀♀; 74 immatures.

DISTRIBUTION

San Francisco County, south to about Monterey County, California (Fig. 406).

RECORDS

CALIFORNIA: San Francisco County: San Francisco (AMNH) (CAS) (MCZ); Golden Gate Park (AMNH) (DJB); Ingleside, San Francisco (UU); San Mateo

County: Jasper Ridge, nr. Palo Alto (UU); Kings Mtn, nr Palo Alto (AMNH); La Honda (AMNH); La Honda Road, 6 Mi. W. Skyline Drive (PRC); Memorial Park (MCZ); San Bruno Hills (AMNH); Woodside (AMNH); Santa Clara County: Palo Alto (AMNH); Stanford (UU); Stevens Creek (AMNH); Santa Cruz County: Ben Lomond, 1600 ft. alt. (AMNH); Big Basin Redwood State Park (PRC); Boulder Creek (AMNH); Felton (AMNH) (MCZ); Felton, Santa Cruz Mountains, 300 - 500 ft. alt. (CU).

Callobius rothi Leech, new species

(Figs. 67 - 68, 262 - 263, 406)

Callobius rothi Leech, new species.

HOLOTYPE: Male, CNC.

TYPE LOCALITY: CALIFORNIA: Marin County: Inverness. 20 ft. alt.

Collected as penultimate male on August 10, 1968,
emerged as adult male on September 16, 1968. R.E.
Leech. In laurel (bay) tree leaf litter and under
rocks.

DESCRIPTION

Male. Color. Carapace uniform orange (teneral specimens are pale green yellow). Legs slightly paler than carapace. Palpi, except for darker tibiae, same color as legs. Chelicerae same color as carapace or very slightly darker. Endites of palpi and labium same color as legs. Sternum slightly paler than legs. Opisthosoma gray or gray brown. Dorsum with indistinct spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about seven to nine mm.

Carapace about 1.3 to 1.4 times as long as wide. AME about radius or slightly more of one AME apart. AME slightly smaller than ALE. AME almost twice as large as PME.

Female. Color. Carapace orange in thoracic region darkening to dark red in cephalic region. Legs about same color as thoracic region of carapace, darkening slightly distally. Femora and patellae of palpi same color as legs, tibiae and tarsi same as cephalic region of carapace. Chelicerae dark brown red. Endites of palpi and labium brown. Sternum about same color as legs. Opisthosoma pale gray brown, gray, or gray black. Dorsum of most specimens unmarked, or with very faint, indistinct, pale spots and chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about eight to fifteen mm.

Carapace about 1.4 to 1.45 times as long as wide. AME slightly less than diameter or more than a diameter of one AME apart. AME equal to or smaller in size than ALE. AME almost twice as large as PME.

FIELD NOTES

Members of this species were collected in laurel leaf litter, under rocks and logs, and in caves. Adult males were collected in early November. One penultimate male collected in early August, 1968, emerged on September 16, 1968, as an adult. Females were collected throughout the year.

REMARKS

This species is named after Mr. Vincent Roth of Portal, Arizona. Mr. Roth has collected specimens of many species of the genus Callobius in California and Oregon.

One vial labelled "Amaurobius nevadensis Sim. Olympia Wash. Kincaid", from the Museum of Comparative Zoology, is a member of this species, but the locality is in doubt. The holotype of this species is slightly teneral.

MATERIAL EXAMINED

Holotype ♂; 2 ♂♂; 12 ♀♀; 2 immatures.

DISTRIBUTION

Marin and Sonoma Counties, California, and Olympia, Washington (see REMARKS above) (Fig. 406).

RECORDS

CALIFORNIA: Marin County: Inverness (AMNH) (CAS) (CNC) (RL); W. Inverness (AMNH); Cascade Canyon, Mill Valley (AMNH); Muir Woods National Monument (UU); S.P. Taylor State Park (AMNH); Sonoma County: 1.1 Mi. S. Occidental (AMNH).
WASHINGTON: Thurston County: Olympia (MCZ) (Record in doubt).

Callobius pauculus Leech, new species

(Figs. 264 - 265, 407)

Callobius pauculus Leech, new species.

HOLOTYPE: Female, CNC.

TYPE LOCALITY: CALIFORNIA: Tehama County: Covelo-Paskenta Road,
18 Air Miles ENE of Covelo. 6200 ft. alt. 9.VIII.
1968. Frances O. Leech. (Specimen badly damaged).

DESCRIPTION

Male. Unknown.

Female. Color. Carapace yellow orange at posterior margin darkened to red brown at anterior margin. Legs about same color as thoracic region of carapace. Femora and patellae of palpi same color as legs, tibiae and tarsi same color as anterior region of carapace. Chelicerae dark brown red. Endites of palpi and labium brown. Sternum same color as legs or slightly darker. Opisthosoma gray. Dorsum and venter unmarked.

Structure. Total length about nine to ten mm. Carapace about 1.45 to 1.6 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME slightly larger than PME.

REMARKS

The name for this species is derived from the Latin word pauculus, meaning few. This name was selected as there are so few specimens known for this species.

MATERIAL EXAMINED

Holotype ♀; one paratype ♀; one penultimate ♂.

DISTRIBUTION AND RECORDS

Known only from the type locality, Tehama County, California (Fig. 407).

Callobius pictus (Simon)

(Figs. 69 - 74, 266 - 270, 408)

Callobius pictus Simon, 1884:324.

LECTOTYPE: Here designated. Male, MNHN. Vial with label reading "Wash. terr. b.431". In same vial a female.

TYPE LOCALITY: "Washington-Territory (Pacifique)".

Amaurobius pictus: Chamberlin and Ivie, 1947b:50. Chamberlin and Ivie, 1947a:9, 12. Bonnet, 1955:291. Turnbull, 1952:2.

Callobius pictus: Chamberlin, 1947:9. Roewer, 1954:1365. Thorn, 1967:14. Lehtinen, 1967:220.

Amaurobius melanus Chamberlin and Ivie, 1947b:46.

HOLOTYPE: Immature female, AMNH.

TYPE LOCALITY: CALIFORNIA: Monterey County: Pacific Grove.
September 1, 1937. Wilton Ivie, collector.
(36°38'N, 121°55'W). NEW SYNONYMY.

Amaurobius melanus: Vogel, 1967:17.

Callobius melanus: Chamberlin, 1947:8. Roewer, 1954:1365. Lehtinen, 1967:220.

Amaurobius subnomeus Chamberlin and Ivie, 1947b:53.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Monterey County: Pacific Grove.

August 18, 1932. S.D. Durrant, collector.

(36°38'N, 121°55'W). NEW SYNONYMY.

Amaurobius subnomeus:Vogel, 1967:18.

Callobius subnomeus:Chamberlin, 1947:9. Roewer, 1954:1366. Lehtinen, 1967:220.

NOTES ON SYNONYMY

At the time of the last revision of the genus Callobius (Chamberlin, 1947), pictus was known only from Oregon north to Alaska. Males and females were collected since from along the California coast as far south as Monterey County. The holotype of Amaurobius subnomeus is a typical pictus. Chamberlin and Ivie (1947:46), in reference to Amaurobius melanus, stated that, "This species is evidently closely related to subnomeus, but is distinguishable from that and other species by its dense black abdomen." Eye sizes and pattern, leg spines on Metatarsi I and II, definitely indicate that melanus is conspecific with pictus. It is probable that the dark color of melanus results from a premoult condition, as many spiders become dark colored just before moulting.

DIAGNOSIS

This is the only species in the genus Callobius whose male members have a mesal process shorter than the dorsal process.

DESCRIPTION

Male. Color. Carapace uniform yellow or pale orange yellow. Legs about same color as carapace. Legs of some specimens with pale gray annulations. Palpi, except for darker tibiae and cymbium, same color as legs. Chelicerae slightly darker than carapace. Endites of palpi and labium pale orange brown. Sternum gray brown. Opisthosoma gray or gray black. Dorsum with distinct pale spots anteriorly, chevrons posteriorly. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about eight to ten mm. Carapace about 1.3 to 1.45 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME larger than PME.

Female. Color. Carapace yellow or orange at posterior margin, darkening to orange or dark brown red at anterior margin. Legs about same color as posterior margin of carapace. Femora and patellae of palpi about same color as thoracic region of carapace, tibiae and tarsi about same color as cephalic region of carapace. Chelicerae orange brown or dark brown red. Endites of palpi and labium brown. Sternum orange yellow or brown, darker than legs. Opisthosoma gray or gray black. Dorsum with distinct pale spots anteriorly, chevrons posteriorly. Venter with two or four pale stripes between epigastric furrow and spinnerets.

Structure. Total length about eight to eighteen mm. Carapace about 1.4 to 1.45 times as long as wide. AME about diameter or slightly less of one AME apart. AME smaller than ALE. AME larger than PME.

FIELD NOTES

Males and females of this species were collected throughout the year. One egg sac, collected on August 18, 1968, at 3 Miles East of Santiam Pass, Jefferson County, Oregon, contained 259 spiderlings and 24 unfertilized eggs. Another egg sac, collected on August 19, 1968, at Maple Leaf Camp Ground, 6 Miles East of Randle, Lewis County, Washington, contained 82 spiderlings. Specimens of this species were collected in standing, rotten conifer stumps and in rotten conifer logs, and in wood piles (during the winter) covered with snow.

REMARKS

Lehtinen (1967:220) incorrectly credits Chamberlin and Ivie (1947) with this species name. Occasional female specimens of this species have three basal spines on Metatarsi I and/or II. Two vials were found, one labelled "Unalaska, June, 1932. Iridam", and the other "Maloney's Cr.". It is uncertain if the former label means "Onalaska," Lewis County, Washington, or "Unalaska Island", an island in the Aleutian Island chain, and if the latter label means "Malone Creek," King County, Washington.

MATERIAL EXAMINED

Lectotype ♂; 131 ♂♂; 299 ♀♀; 144 immatures.

DISTRIBUTION

Mainly Pacific Coast from Alaska to California, with one record from Idaho (Fig. 408).

RECORDS

CANADA

BRITISH COLUMBIA: Lake Cameron, Vancouver Island (UU); Comox (CNC); Cultus Lake (AMNH) (ROM); Departure Bay, Vancouver Island (AMNH) (ROM); Florence Lake (BCPM) (UU); Fountain Valley, nr Lillooet (CNC); Goldstream Park, Vancouver Island (AMNH); 10 Mi. E. Hope on Hwy 3, 2240 ft. alt. (RL); Inverness Passage, 54°N, 130°W (S.E.) (CNC); Kyoquot (AMNH) (BCPM); Langford (RL); Lillooet (CNC); Masset, Queen Charlotte Islands (AMNH); Mt. McLean, Lillooet (CNC); Metchosin, 15 Mi. W. Victoria (BCPM); Metlakatla (CNC) (MCZ); Mill Hill, nr Victoria (RL); Ocean Falls (AMNH); Prince Rupert (ROM); Sand River (BCPM); Sartine Island, Rupert District (ROM); Sidney, Vancouver Island (UU); Terrace (CNC) (MCZ) (ROM); Thetis Lake, Victoria (BCPM); Tsawitti, Head of Knight Inlet (BCPM); Vancouver (CNC) (RL); Wellington, Vancouver Island (AMNH); Victoria (BCPM).

UNITED STATES

ALASKA: Afognak Island, Kitoi Bay Research Station (MCZ); Bradfield Inlet, 30 Mi. S.E. Wrangell (CNC); Camp Island, Karluk Lake, Kodiak Island (HEF) (MCZ); Cape Yakataga (AMNH); Crab Bay (HEF); Douglas Island, Beach at Douglas (MCZ); Haines (UU); Juneau (UU); Ketchikan (AMNH); Kodiak, Kodiak Island (MCZ); Kosciusko Island, Edna Bay (AMNH); Old Tom's Creek, W. Ketchikan (MCZ); Ves Bay, 40 Mi. W. Ketchikan (HEF); Ward Point, 56°10'30"N, 131°58'00"W (CNC); Wrangell (AMNH) (CU); S.E. Wrangell (AMNH); Yakutat (ROM).

CALIFORNIA: Mendocino County: Albion (AMNH); Gualala (CU); Mendocino (AMNH); Monterey County: 1 Mi. N. Carmel (AMNH); Carmel Entrance to 17

Mile Drive (AMNH); Carmel and Pacific Grove nr. Carmel Hill Gate (AMNH); Pacific Grove (AMNH) (CU) (UU); Palo Colorado Ranch on Hwy 1, ca. 12 Mi. S. Carmel, 1050 ft. alt. (MCZ); Pebble Beach (AMNH); Santa Cruz County: Big Trees Park, nr. Felton (AMNH).

IDAHO: Custer County: Salmon River, 12 Mi. N. Challis (AMNH).

OREGON: Benton County: Corvallis (AMNH) (MCZ); Oak Creek, Corvallis (AMNH); Sulfur Springs, N. Corvallis (AMNH); McDonald Forest N. of Corvallis (AMNH); Clackamas County: 8 Mi. S.E. Colton (AMNH); Deschutes County: Wilamette Pass, 5120 ft. alt. (AMNH); 2 Mi. W. Divide (AMNH); Comstock (UU) Hood River County: Perham Creek (UU); Jefferson County: Hwy 20/126, 3 Mi. E. Santiam Pass Summit at Bench Mark of U.S. Coast and G.S. # 0378, 4200 ft. alt. (RL); Klamath County: Odall Lake, 4840 ft. alt. (AMNH); Lane County: Eugene (AMNH); Low Pass Summit, 1150 ft. alt. (AMNH); McCredie Springs (AMNH); Nimrod (AMNH); Opposite Salt Creek Falls, Wilamette Hwy, 4400 - 4600 ft. alt. (AMNH); Spencer Butte (AMNH); Wilamette Pass (AMNH); Lincoln County: Hidden Lake, Newport (UU); Yaquina River, 6 Mi. E. Newport (AMNH); Linn County: 5 Mi. W. Hogg Pass (= Santiam Pass), at Lost Lake (AMNH); Marion County: 8 Mi. S. Salem (UU); Santiam River (CU); Silver Creek Falls (AMNH) (UU); Multnomah County: Portland (AMNH) (HEF) (MCZ); Tillamook County: Boyer (UU); 2 Mi. S. Dolph (UU); N.E. Mohler (UU); Wasco County: The Dalles (AMNH); Blue Box Pass on Hwy 26, 6 Mi. S.S.E. Jctn Hwys 26 and 35, 4025 ft. alt. (RL); Yamhill County: Dayton (AMNH); McMinnville (MCZ); High Heaven, McMinnville (AMNH); Peavine Ridge, nr McMinnville (AMNH).

WASHINGTON: "Washington" (CU); Clallam County: Crescent Lake, Olympic Peninsula (AMNH); Lake Sutherland (CU); Sol Duc Hot Springs (CU); Clark County: Washougal (UU); Grays Harbor County: 5 Mi. E. McCleary (AMNH); E.

Fork Satsop River, Olympic Mountains (HEF); King County: Bothell (HEF); Cedar River (HEF); Lake Semamish State Park (AMNH); North Bend (AMNH) (HEF); Seattle (AMNH) (CMNH) (HEF); Capitol Hill, Seattle (HEF); Ravenna Park, Seattle (HEF); Skykomish (AMNH); Snoqualmie Pass, 3010 ft. alt. (MCZ) (UU); Kitsap County: Rolling Beach (HEF); Kittitas County: Cle Elum (UU); Lewis County: Chehallis (UU); Maple Leaf Camp Ground, 6 Mi. E. Randle, 1050 ft. alt. (RL); Mineral (HEF); 2 Mi. W. White Pass Summit, or, 11 Mi. E. Jctn of Hwys 12 and 143, 4150 ft. alt. (RL); Pierce County: Carbon River, Mt. Rainier National Park, 2000 - 3000 ft. alt. (AMNH); Fort Lewis (HEF); Gig Harbor (HEF); Longmire, 2760 ft. alt. (CU); Puyallup (MCZ); Tacoma (HEF) (UU); San Juan County: Anacortes Island (HEF); Friday Harbor (AMNH) (HEF) (MCZ); Ice Berg Point, San Juan Island (HEF); Hummil Lake, Lopez Island (MCZ); Mt. Constitution (MCZ); Orcas Island (MCZ); San Juan Island (HEF); Shipjack Island (HEF); Spieden Island (MCZ); Snohomish County: Chase Lake (AMNH); Everett (HEF); Stillaguamish (HEF); Thurston County: Olympia (AMNH) (HEF) (MCZ).

Callobius severus (Simon)

(Figs. 75 - 82, 271 - 279, 409)

Amaurobius severus Simon, 1884:319.

LECTOTYPE: Here designated. Male, MNHN. Seen. Vial with label reading, "b.428. Wash. Terr., California, Oregon." In same vial a female.

TYPE LOCALITY: "Washington-Territory (Pacifique)".

Amaurobius severus: Leech, 1947:22. Chamberlin and Ivie, 1947b:51.

Turnbull, 1952:3. Bonnet, 1955:293.

Callobius severus:Chamberlin, 1947:9. Roewer, 1954:1366. Thorn,
1967:14. Lehtinen, 1967:220.

Amaurobius severinus Chamberlin and Ivie, 1947b:51.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: San Luis Obispo County: Cambria.

November 16, 1937. (35°26'N, 121°04'W). NEW

SYNONYMY.

Amaurobius severinus:Turnbull, 1952:2. Vogel, 1967:18.

Callobius severinus:Chamberlin, 1947:9. Roewer, 1954:1366.

NOTES ON SYNONYMY

As in specimens of nevadensis, females of severus are variable. The ectal concavity of the lateral lobes of the epigynum is seen as a cline, varying from a deep concavity to a shallow concavity. Typical severus specimens have a deep concavity on the lateral lobes. The holotype of severinus has a shallow concavity, but it is otherwise typical of severus.

DIAGNOSIS

The ectally concave lateral lobes on the epigynum of the females, and the peculiar, obliquely-truncate dorsal process on the palpal tibia of the males, serve to distinguish the members of this species from all other species of the genus Callobius. The other diagnostic characteristics are given in the key and illustrated in the figures.

DESCRIPTION

Male. Color. Carapace uniform yellow or orange. Legs slightly paler than carapace. Femora and patellae of palpi same color as legs, tibiae slightly darker than carapace. Chelicerae slightly darker than carapace. Endites of palpi and labium slightly darker than legs. Sternum same as legs. Opisthosoma gray or gray black. Dorsum unmarked or with pale spots anteriorly, one or two chevrons posteriorly. Venter with two or four pale stripes between epigastric furrow and spinnerets.

Structure. Total length about eight to fifteen mm. Carapace about 1.25 to 1.4 times as long as wide. AME about radius of one AME apart. AME slightly larger than or equal in size to ALE. AME larger than PME.

Female. Color. Carapace orange red at posterior margin, darkened to dark red at anterior margin. Legs about same color as thoracic region of carapace. Femora, patellae and tibiae of palpi about same color as legs, tarsi about same color as anterior margin of carapace. Chelicerae dark brown red. Endites of palpi and labium brown. Sternum about same color as legs. Opisthosoma cream, gray, gray brown, or gray black. Dorsum unmarked, with two or four pale spots, or with pale spots and one or two chevrons. Venter with two pale stripes posterior to book lung openings.

Structure. Total length about nine to twenty-one mm. Carapace about 1.4 to 1.40 times as long as wide. AME slightly less than diameter of one AME apart. AME about same size as ALE. AME about twice size of PME.

FIELD NOTES

Members of this species were collected inside old rotten conifer stumps and logs, and under loose bark of old, rotten, damp stumps and logs. Males of this species are active from June to October, with August as the peak month. Females are active from May to November, with August and September as peak months. No egg sacs were found for this species.

REMARKS

For some reason Lehtinen (1967:220) omitted the name Callobius severinus in his revision. One vial, bearing the label "Westminster, Oregon" is probably an error for "Westminster, Orange County, California." and the record of Edmonton, Alberta, is most likely an introduction to Alberta as the specimen was found in a pile of lumber from British Columbia.

MATERIAL EXAMINED

Lectotype ♂; 145 ♂♂; 264 ♀♀; 135 immatures.

DISTRIBUTION

Alberta, British Columbia south to California (Fig. 409).

RECORDS

CANADA

ALBERTA: Edmonton (RL).

BRITISH COLUMBIA: Alberni (BCPM); Comox (CNC); Cultus Lake (ROM); Departure Bay (ROM); Florence Lake, Vancouver Island (BCPM); Kyuquot

(AMNH) (BCPM); Malahat, nr Victoria (BCPM); Nanaimo (ROM) (UU); Oak Bay, Victoria (BCPM); Parksville, Vancouver Island (AMNH); Sidney, Vancouver Island (UU); South Pender Island (BCPM); Steelhead (AMNH); Thetis Island (BCPM); Thetis Lake (BCPM); Tofino (AMNH); Victoria (BCPM) (MCZ); Wellington, Vancouver Island (AMNH); West Point Gray, Vancouver (RL); William Head, nr Victoria (AMNH) (ROM).

UNITED STATES

CALIFORNIA: Alameda County: Berkeley (CU) (MCZ) (UU); Strawberry Canyon, Berkeley (AMNH); Tilden Park, Berkeley (AMNH); University of California Campus, Berkeley (AMNH); Camp Loma Mar (Oakland YMCA) (PRC); Castro Valley (AMNH); Diamond Canyon, Oakland Hills (AMNH); Contra Costa County: Mt. Diablo (MCZ); Humboldt County: Carlotta (AMNH); 9 Mi. E. Carlotta (AMNH); Fort Seward (CU); Miranda (CU); Phillipsville (AMNH); Redwood Summit, 20 Mi. W. Willow Creek, 2262 ft. alt. (RL); 5 Mi. S. Scotia (AMNH); Founders Tree, Weott (AMNH); Marin County: Mill Valley (CAS); S. end of S.P. Taylor State Park (AMNH); Mendocino County: Albion (AMNH); Anchor Bay (AMNH); Public Camp Ground, Anchor Bay (AMNH); 12 - 15 Mi. E. Noyo (AMNH); Piercy (AMNH); Hartsook Inn, Piercy (AMNH); 5 Mi. N. Piercy (AMNH); Monterey County: Big Sur (AMNH); Carmel (AMNH) (UU); Grimes Ranch, Palo Colorado Canyon, 3000 ft. alt. (MCZ); Monterey (AMNH); Pacific Grove (AMNH) (UU); Palo Colorado Ranch on Hwy 1, 200 ft. alt. (MCZ); Robles del Rio (included in town of Carmel Valley), about 12 Mi. E.S.E. Carmel (AMNH); San Diego County: Mt. Palomar State Park (AMNH); San Francisco County: San Francisco (MCZ); San Luis Obispo County: Cambria (AMNH) (UU); Morro Bay (AMNH); San Mateo County: Atherton (UU); Jasper Ridge (UU); Redwood Park (UU); Santa Barbara County: 10 Mi. W.

Santa Barbara (UU); Santa Ynez Mtns (AMNH); Santa Clara County: San Jose (MCZ); Silver Creek Hills, San Jose (MCZ); Santa Cruz County: Ben Lomond (AMNH); Felton (MCZ); Sonoma County: Guerneville (AMNH); Guerneville-Healdsburg Road (= Westside Road), 9 Mi. from Guerneville, 140 ft. alt. (RL); Tuolumne County: Aspen Valley, Yosemite National Park (UU).

OREGON: "Coast of Oregon" (MCZ); Benton County: Alsea (AMNH); McDonald Forest N. of Corvallis (AMNH); Philomath (UU); Clackamas County: Brightwood (AMNH); Oswego (UU); Clatsop County: Cannon Beach (HEF); Columbia County: St. Helena (AMNH); Coos County: Cape Arago (AMNH); Curry County: 6 Mi. E. Pistol River (AMNH); Jackson County: Medford (AMNH); Siskiyou (AMNH); Jefferson County: Hwy 20/126, 3 Mi. E. Santiam Pass, at U.S. Coast and Geod. Survey # 0378, 4200 ft. alt. (RL); Klamath County: From Cave, Crater Lake National Park (AMNH); Klamath Lake (HEF); Lane County: Coburg (AMNH); Coburg Hills, 3 Mi. N.E. Coburg (AMNH); Eugene (AMNH); Spencer Butte, Eugene (AMNH); Oakridge (AMNH); Siltcoos Lake (CAS); Linn County: Cascadia (AMNH); Corvallis (AMNH) (UU); Marion County: Cedar Creek (AMNH); Silver Creek Falls (UU); Multnomah County: Portland (AMNH) (MCZ); Tillamook County: 2 Mi. S. Dolph (UU); Yamhill County: McMinnville (AMNH).

WASHINGTON: "Washington" (MCZ); Clallam County: Crescent Lake, Olympic Peninsula (AMNH); Sequim (AMNH) (UU); Grays Harbor County: Quinault (HEF); King County: Kent (HEF); Renton (HEF); Seattle (CMNH) (HEF); Ravenna Park, Seattle (HEF); Lewis County: Chehallis (UU); Maple Leaf Camp Ground, 6 Mi. E. Randle, 1050 ft. alt. (RL); Mason County: Lake Cushman (HEF); Pacific County: Brooklyn (HEF); Pierce County: Gig Harbor (HEF); Graham (AMNH); Mt. Rainier (HEF); Puyallup (MCZ); San Juan

County: Friday Harbor (HEF) (MCZ); Orcas Island (HEF); Spieden Island (MCZ); Sunnyside, Whidby Island (HEF); Snohomish County: Chase Lake (HEF); Edmonds (HEF); Everett (HEF); Snohomish (HEF); Thurston County: Olympia (HEF) (MCZ).

Callobius tehama Leech, new species

(Figs. 83 - 84, 280 - 281, 407)

Callobius tehama Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Tehama County: nr Junction of Hwys 89 and 36, South of Lassen Volcanic National Park. 19.IX.1961. Wilton Ivie and Willis J. Gertsch, collectors. (Vial contains holotype ♂ and one paratype ♀.)

DESCRIPTION

Male. Color. Carapace uniform orange. Legs slightly paler than carapace. Femora and patellae of palpi same color as legs, tibiae darker, brown orange. Chelicerae slightly darker than carapace. Endites of palpi, labium, and sternum about same color as legs. Opisthosoma pale gray. Dorsum with pale spots anteriorly, chevrons posteriorly.

Structure. Total length 8.6 mm. Carapace 1.48 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME subequal in size to PME.

Female. Color. Carapace medium orange in thoracic region darkened to dark orange in cephalic region. Legs about same color as thoracic region of carapace. Femora, patellae, and tibiae of palpi about same color as legs, tarsi same color as thoracic region of carapace. Chelicerae dark brown red. Endites of palpi brown. Sternum same color as legs or slightly darker. Opisthosoma pale gray to gray black. Dorsum unmarked or marked with pale spots anteriorly, chevrons posteriorly. Venter with two stripes posterior to book lung openings.

Structure. Total length about 8.5 to 12.5 mm. Carapace about 1.4 to 1.55 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME larger than PME.

FIELD NOTES

Specimens of this species were collected under pine bark on ground in tall pine forest. The only known male for this species was collected on September 19, 1961. Females were collected in April, May, August, September, and October. Two egg sacs collected on August 16, 1968, contained 134 spiderlings, and 44 spiderlings with 12 unfertilized eggs.

RE MARKS

The name for this species is derived from the word tehama, a county in California. The origin of this word is uncertain (Gudde, 1969: 332).

MATERIAL EXAMINED

Holotype ♂; 18 ♀♀; 15 immatures.

DISTRIBUTION

Butte, Lassen, Shasta, and Tehama Counties, California (Fig. 407).

RECORDS

CALIFORNIA: Butte County: Cohasset, north of Richardson Springs (CAS); Lassen County: Emerald Lake, Lassen Volcanic National Park, 8000 ft. alt. (AMNH); Shasta County: Samwell Cave, Shasta Lake (AMNH); Tehama County: nr Jctn of Hwys 89 and 36, S. of Lassen Volcanic National Park (AMNH); Morgan Pass Summit, nr Jctn of Hwys 89 and 36, 5800 ft. alt. (RL); East side of Morgan Pass Summit, 2 Mi. East of Jctn of Hwys 89 and 36 on Hwy 36/89, 5300 ft. alt. (RL); Jctn of Hwys 89 and 36, S. of Lassen Volcanic National Park, 5700 ft. alt. (RL); Hwys 89 and 36, South of Lassen Volcanic National Park, 5300 ft. alt. (RL); 3.5 Mi. South of boundary of Lassen Volcanic National Park on Hwy 89 (RL).

Genus Callioplus Bishop and Crosby

Callioplus Bishop and Crosby, 1935:45.

TYPE SPECIES: Amaurobius hoplites Bishop and Crosby,
1926:171, by original designation.

REMARKS

Members of the genus Callioplus are closely related to members of the genus Callobius. The female members of the genus Callioplus bear a stronger resemblance to those of Callobius than do the male members.

The genus name Callioplus was proposed by Bishop and Crosby (1935:45) to include six species, namely C. armipotens (Bishop and Crosby), Callioplus euoplus Bishop and Crosby, C. hoplites (Bishop and Crosby), C. hoplomachus (Bishop and Crosby), C. pantoplus Bishop and Crosby, and C. tibialis (Emerton). Chamberlin (1947:17) added one more species name to the genus, and two new species names are proposed in this study.

Members of the genus Callioplus are known from the Nearctic Region, Japan, and Chiapas, Mexico. The genus contains probably not more than 20 species throughout the world.

I am not in agreement with Lehtinen's synonymy of Alauximus Bryant, 1948:345, and Callioplus. The description of members of the genus Alauximus, A. infumatus Bryant, 1948:347, in particular, most closely resembles that of the Cuban genus Tugana.

DIAGNOSIS OF THE GENUS Callioplus

AME smaller than PME, usually about half as large. Epigynum with two lateral lobes convergent posteriorly. Spermathecae inside lateral lobes. Lateral lobes of epigynum extended posteriorly beyond epigastric furrow. Median and posterior lobes of epigynum absent. Cribellum bipartite (not obvious in some specimens). Calamistrum present in both males and females. Calamistrum delimited at each end by spine. In male, ectal process of palpal tibia expanded distally, with one or more subprocesses. Mesal process of palpal tibia longest, with one or more subprocesses. Femora each with one or more spines.

Key to the Nearctic Species
of the Genus Callioplus

- 1. Male 2
- Female 10
- 2 (1). Mesal process on tibia of palpus subdivided into three sub-
processes (Figs. 85, 89) 3
- Mesal process on tibia of palpus single, or at most subdivided
into two subprocesses (Figs. 90, 96) 5
- 3 (2). Mesal process on tibia of palpus subdivided into three sub-
processes, one large and two small ones, the small ones
subequal in size tibialis (Emerton), p. 131
- Not as above 4
- 4 (3). Most ventral of mesal subprocesses on tibia of palpus with
bulge near midpoint of mesal or anterior margin (Figs. 85, 87).
Dorsum of opisthosoma without folium or color pattern
..... euoplus Bishop and Crosby, p. 128
- Most ventral of mesal subprocesses on tibia of palpus straight
along mesal or anterior margin. Dorsum of opisthosoma with
folium or pale spots spenceri, new species, p. 140
- 5 (2). Mesal process on tibia of palpus single, not divided
..... armipotens (Bishop and Crosby), p. 148
- Mesal process on tibia of palpus subdivided into two
subprocesses 6
- 6 (5). Main mesal subprocess on tibia of palpus arcuate, long and
thin, with smaller subprocess near base of larger process on
ectal margin 7

- Mesal process on tibia of palpus subdivided distally into two straight subprocesses or subdivided basally into two subprocesses bent at right angle near bases 9
- 7 (6). Small subprocess broad and flat, tapered near end to fine point hoplites (Bishop and Crosby), p. 144
- Not as above 8
- 8 (7). Small subprocess of almost uniform thickness throughout length, only slightly curved posteriorly
..... pantoplus Bishop and Crosby, p. 142
- Small subprocess of almost uniform thickness throughout length, distinctly hooked, with tip pointed towards base of palpus hoplomachus (Bishop and Crosby), p. 146
- 9 (6). Mesal subprocess on tibia of palpus bent at right angle near bases wabritaskus, new species, p. 137
- Mesal process on tibia of palpus subdivided distally into two straight subprocesses macarius Chamberlin, p. 135
- 10 (1). Area enclosed between bases of lateral lobes of epigynum about as wide as long, or longer than wide 11
- Area enclosed between bases of lateral lobes of epigynum distinctly wider than long 14
- 11 (10). Area enclosed between bases of lateral lobes of epigynum about two times as long as wide. AME very small, less than half size of PME. Spermathecae about as wide as long
..... hoplomachus (Bishop and Crosby), p. 146
- Area enclosed between bases of lateral lobes about as wide as long, or only slightly longer than wide 12

- 12 (11). PME about two diameters of one PME apart. AME very small, less than half as large as PME. Spermathecae slightly longer than wide, ovate (Fig. 289). Dorsum of opisthosoma with two rows of whitish spots decreased in size posteriorly
 hoplites (Bishop and Crosby), p. 144
 - Not as above 13
- 13 (12). AME about half as large as PME. Spermathecae slightly longer than wide, subovate to kidney-shaped (Figs. 287 - 288). Dorsum of opisthosoma with two rows of whitish spots decreased in size posteriorly pantoplus Bishop and Crosby, p. 142
 - AME very small, less than half as large as PME. Spermathecae almost as wide as long. Dorsum of opisthosoma with two rows of whitish spots decreased in size posteriorly
 armipotens (Bishop and Crosby), p. 148
- 14 (10). Spermathecae clearly three times as long as wide, arcuate. AME equal or subequal in size to PME
 spenceri, new species, p. 140
 - Not as above 15
- 15 (14). AME slightly smaller than PME. Spermathecae slightly more than two times as long as wide (ratio 12:5). Dorsum of opisthosoma without folium or color pattern
 euoplus Bishop and Crosby, p. 128
 - Not as above 16
- 16 (15). Long axis of spermathecae almost at right angle to body length of spider. AME about radius of one AME apart. PME about 1.5 diameters of one PME apart. Range: -New England area of

- U.S., southern Québec, New Brunswick and Newfoundland ...
 tibialis (Emerton), p. 131
- Not as above 17
- 17 (16). Area enclosed between bases of lateral lobes of epigynum very small and indistinct, wider than long. Dorsum of opisthosoma without folium. Long axis of spermathecae almost parallel to body length of spider ... wabritaskus, new species, p. 137
- Area enclosed between lateral lobes of epigynum distinctly visible. Dorsum of opisthosoma with distinct folium. Long axis of spermathecae at about 45° to body length of spider
 macarius Chamberlin, p. 135

Callioplus euoplus Bishop and Crosby

(Figs. 85 - 88, 282, 410)

Callioplus euoplus Bishop and Crosby, 1935:45.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: MAINE: Aroostook County: Molunkus Pond. August 25, 1925.

Callioplus euoplus: Crosby and Zorsch, 1935:38, 39. Hackman, 1954:10, 94. Roewer, 1954:1363. Bonnet, 1956:935. Freitag et al., 1969:1332.

DESCRIPTION

Male. Color. Carapace uniform pale orange yellow. Femora of legs about same color as carapace. Legs darkened distally. Femora and patellae of palpi same as legs; tibiae of palpi darker than those of

legs. Chelicerae pale brown. Endites of palpi and labium same color as chelicerae. Sternum yellowish, brighter than coxae. Opisthosoma brown gray or dark gray. Dorsum with two pairs of pale spots anteriorly, with indistinct and/or incomplete chevrons posteriorly. Opisthosoma of some males unmarked.

Structure. Total length about 3.5 to five mm. Carapace extremes 2.0 to 2.2 mm long, 1.5 to 1.6 mm wide. AME smallest eyes, ALE largest. AME slightly more than radius of one AME apart. ALE slightly less than twice as large as AME.

Female. Color. Carapace yellow orange, darkened anteriorly. Femora of legs paler than carapace. Legs darkened distally. Palpi colored as legs. Chelicerae chestnut brown. Endites of palpi and labium brown. Sternum pale brown, darker than coxae. Opisthosoma gray or brown gray. Dorsum unmarked, or marked indistinctly with two rows of pale spots decreased in size posteriorly, or marked with indistinct chevrons.

Structure. Total length about four to seven mm. Carapace extremes 2.2 to 2.6 mm long, 1.4 to 1.8 mm wide. AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE slightly less than twice as large as AME.

FIELD NOTES

Males of this species were collected from April to October, with May and June as peak months. Females were collected from April to November, with May and June as peak months. Specimens of this species

are commonly found in deep deciduous leaf litter, and are most easily obtained in numbers by either pitfall or Berlese funnel methods.

MATERIAL EXAMINED

Holotype♂; 222 ♂♂; 201 ♀♀; 90 immatures.

REMARKS

Hackman (1954:94) reported this species from many localities in Newfoundland.

DISTRIBUTION

Nova Scotia and Newfoundland west to British Columbia, north to the western part of the Northwest Territories in Canada. Known only from Maine, Minnesota and Wisconsin in the United States (Fig. 410).

RECORDS

CANADA

ALBERTA: Camp nr Carrot Creek (AMNH); Edmonton (ROM); George Lake, 53°57'N, 114°06'W (RL); Hwy 43, ca. 4 Mi. W. Two Creek Campground, 54°18'N, 116°23'W (RL); Spring Creek Basin, 53°30'N, 117°40'W (RL); Whitecourt (AMNH); 10 Mi. N.W. Whitecourt (AMNH).

BRITISH COLUMBIA: Field (AMNH); Tupper (AMNH).

MANITOBA: Lake Max, Turtle Mountain, 15 Mi. S. Deloraine (CNC).

NEWFOUNDLAND: St. Barb (ZMUH).

NORTHWEST TERRITORIES: Deep Bay, Great Slave Lake (RL); Wrigley (CNC); 40 Mi. N.W. Enterprise, 60°55'N, 117°10'W (AMNH).

NOVA SCOTIA: Cow Bay (CNC).

ONTARIO: Arnprior (CU); Bear Island, Lake Timagami (AMNH); Black Sturgeon Lake (CNC); Departure Lake, 8 Mi. W. Smooth Rock Falls (MCZ); Hwy 11, 0.6 Mi. W. Jctn Hwys 11/17 (RL); Hwy 11, 0.2 Mi. E. Road to Huronian (RL); Hwy 11, 1 Mi. W. Kabaigon River (RL); Kashabowie, Jctn Hwys 11 and 802 (RL); Klotz Lake, 30 Mi. E. Longlac (MCZ); Lac Seul (CNC); Loon Lake, Port Arthur (ROM); Opechee Creek, Nipissing District (ROM); Ottawa (CNC); Pt. Ko-Ko-Ko Bay, Lake Timagami (AMNH) (ROM); Port Arthur (= Thunder Bay) (RL); Hwy 11/17, 11.5 Mi. E. Shebandowan (RL); Island 1024, Lake Timagami (AMNH) (ROM).

QUÉBEC: Bagotville (AMNH); Osmond Bay, Tchapahipane Island (AMNH).

SASKATCHEWAN: Besnard Lake (DJB); Lac La Ronge (ROM); Lady Lake (DJB).

UNITED STATES

MAINE: Aroostook County: Molunkus Pond (AMNH); Preque Isle (AMNH).

MINNESOTA: label reading only "Itasca Park, Minn." (AMNH).

WISCONSIN: Lincoln County: Dudley (MCZ).

Callioplus tibialis (Emerton)

(Figs. 89, 283, 411)

Amaurobius tibialis Emerton, 1888:452.

LECTOTYPE: Here designated. Male, MCZ. Label reading: "Lectotype

Amaurobius tibialis Emerton. NEW HAMPSHIRE. Coos County: Mt. Washington. June, 1887."

TYPE LOCALITY: NEW HAMPSHIRE: Coos County: Mount Washington, up to the highest trees. June, 1887.

Amaurobius tibialis: Petrunkevitch, 1911:105. Crosby and Bishop, 1928:

1034.

Callioplus tibialis: Bishop and Crosby, 1935:45. Crosby and Zorsch, 1935:39, 40. Chamberlin, 1947:18. Kaston, 1948: 519. Hackman, 1954:94. Roewer, 1954:1364. Bonnet, 1956:934. Renault, 1968:iii, 7.

nec Callioplus tibialis: Chamberlin and Ivie, 1947a:9, 13. Lindroth and Ball, 1969:134. (see C. wabritaskus.)

DESCRIPTION

Male. Color. Carapace uniform dull orange. Femora of legs paler than carapace. Legs darkened slightly distally. Palpi, except for darker tibiae, same color as legs. Chelicerae orange, brighter than carapace. Endites of palpi and labium orange, about same color as legs distally. Sternum darker than coxae, paler than labium. Opisthosoma gray or gray green. Dorsum marked with pale central longitudinal stripe. Ends of pale chevrons projecting laterad of pale central stripe on posterior half.

Structure. Total length about 5.5 to 6.5 mm. Carapace extremes 2.7 to 2.95 mm long, 1.95 to 2.15 mm wide. AME smallest eyes, ALE largest. AME about radius of one AME apart. ALE slightly less than twice as large as AME.

Female. Color. Carapace dull orange, darkened anteriorly. Carapace with broad pale V demarking central, posterior margin of cephalic region. Chelicerae red orange. Palpi colored as legs. Otherwise colored as male.

Structure. Total length about five to nine mm.

Carapace extremes 3.1 to 3.3 mm long, 2.0 to 2.3 mm wide. Eyes as in male.

FIELD NOTES

Males of this species were collected from early June to late August. Females were collected from June to October. Egg sacs have been collected in Madawaska County, New Brunswick, from late June to late July. Four egg sacs collected with females on July 24, 1968, inside rotten trees, contained 25, 39 and 40 eggs. The fourth sac contained 40 spiderlings. Members of this species were collected under stones and logs, in leaf litter, moss, and inside rotten logs and standing, rotten trees.

The palpal parts of a male of this species were found in a regurgitated pellet of a young gray jay (Perisoreus canadensis) from Québec.

REMARKS

The type series of Amaurobius tibialis, from which the lectotype was selected and designated, contained one female of Calliobius bennetti (Blackwall).

Hackman (1954:94) reported collecting this species in Newfoundland. Smaller females of this species are easily confused with members of the species named Callioplus euoplus. The specimen called C. tibialis by Chamberlin and Ivie (1947a:9, 13) is a member of the species C. wabritaskus, as is that mentioned by Lindroth and Ball

(1969:134).

MATERIAL EXAMINED

Lectotype ♂; 9 ♂♂; 25 ♀♀; 12 immatures.

DISTRIBUTION

New England and eastern Canada (Fig. 411).

RECORDS

CANADA

NEW BRUNSWICK: Madawaska County: Green River Field Station (FFF).

NEWFOUNDLAND: Bartletts River, Pistolet Bay (ZMUH).

QUÉBEC: Herbertville (AMNH); Isle d'Alma, Lac St. Jean (AMNH); La Verendrye Provincial Park (CNC).

UNITED STATES

MAINE: Piscataquis County: Katahdin, 3000 ft. alt. (MCZ); Washington County: Lubec (MCZ).

NEW HAMPSHIRE: Coos County: Mt. Washington (AMNH) (MCZ) (UU); Halfway House, Mt. Washington (AMNH).

NEW YORK: "New York State" (UU); Essex County: Mt. Marcy, 4000 ft. alt. (AMNH); Uphill Brook and Opalescent River (CU); Mt. Whiteface (AMNH) (CU); Summit Mt. Whiteface (CU); Franklin County: Wawbeek (AMNH) (CU).

VERMONT: Chittenden County: Mt. Mansfield (CU) (UU).

GENERAL LOCALITIES: "New England" (AMNH).

UNDETERMINED LOCALITY: label reading "Imp Mt. Camp, Aug. 10, 1906".

As this is an Emerton label, the locality is probably in New Hampshire.

Callioplus macarius Chamberlin

(Figs. 90 - 91, 284, 412)

Callioplus macarius Chamberlin, 1947:17.

HOLOTYPE: Male, UU type collection in AMNH.

TYPE LOCALITY: WASHINGTON: King County: Denny Creek Camp,
Snoqualmie Pass. September 16, 1935. R.V.
Chamberlin and W. Ivie, collectors.

Callioplus macarius:Roewer, 1954:1364. Vogel, 1967:18.

DESCRIPTION

Male. Color. Carapace dusky orange, cephalic region much paler than thoracic region. Femora of legs about same color as cephalic region of carapace. Femora marked with pale annulations ventrally. Palpi, except for darker tibiae, same color as legs. Endites of palpi about same color as coxae or slightly darker. Labium and sternum about same color dark dusky orange. Opisthosoma dark gray, almost black. Dorsum with distinct folium. Entire central area pale, with margins scalloped or chevroned posteriorly. Central part of pale area with reddish tinge, margins yellow.

Structure. Total length about four to five mm. Carapace extremes 2.05 to 2.55 mm long, 1.50 to 1.85 mm wide. AME smallest eyes, ALE largest. AME slightly more than radius of one AME apart. ALE about twice as large as AME.

Female. Color. As male, except palpi colored as legs. Cephalic region of carapace paler than thoracic region only in central

region at cervical groove. Faded specimens lack most distinctive coloring.

Structure. Total length about 4.5 to 6.5 mm. Carapace extremes 2.1 to 2.7 mm long, 1.55 to 1.95 mm wide. AME smallest eyes, ALE largest. AME about radius or slightly more of one AME apart. ALE about 1.5 times as large as AME.

FIELD NOTES

Males of this species were collected in July and September. Females were collected from June to September. Specimens of this species were collected in forested regions.

REMARKS

Both Chamberlin (1947:18) and Vogel (1967:18) list the type locality of this species as "Dansey Creek" on Snoqualmie Pass. However, neither Landes (1917) nor Jones (1970) list a "Dansey Creek". The labels in the vials containing the holotype male and paratypes read: "Washington: Denny Creek Camp, Snoqualmie Pass". Landes (1917:120) gives "Denny Creek" a small tributary of South Fork of Snoqualmie River, near Snoqualmie Pass, in east central King County. The type locality given in the literature is, therefore, questioned.

MATERIAL EXAMINED

Holotype ♂; 11 ♂♂; 31 ♀♀; 12 immatures.

DISTRIBUTION

Oregon and Washington (Fig. 412).

RECORDS

OREGON: Benton County: Marys Peak, 4097 ft. alt. (AMNH) (UU); Hood River County: Hood River Meadows, Hood River Nat. Forest (MCZ); Klamath County: Cascade Summit, 4841 ft. alt. (HEF); Lane County: Obsidian Trail, Frog Camp, Sunshine Shelter, 5500 ft. alt. (AMNH); Obsidian Trail, Three Sisters Primitive Area, 5500 - 6200 ft. alt. (AMNH).

WASHINGTON: Clallum County: Olympic Hot Springs, Olympic Nat. Park (HEF); King County: Denny Creek Camp, Snoqualmie Pass (AMNH) (UU); Pierce County: Longmire, 2761 ft. alt. (CU).

Callioplus wabritaskus Leech, new species

(Figs. 92 - 93, 285, 411)

Callioplus wabritaskus Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: WASHINGTON: ^AGrays Harbor County: 5 Mi. E. McCleary. August 26, 1959. V. Roth and W.J. Gertsch, collectors.

Callioplus tibialis: Chamberlin and Ivie, 1947a:9, 13.

NOTES ON SYNONYMY

Chamberlin and Ivie (1947a:9, 13) listed Callioplus tibialis as being found in Alaska. However, this record is based on a mis-identification, as the specimen they studied from Haines, Alaska, was definitely not C. tibialis (compare figures and descriptions). Lindroth

and Ball (1969:134) listed C. tibialis from Kodiak Island, Alaska. Again, the specimen in question is a member of the species named C. wabritaskus.

DESCRIPTION

Male. Color. (Holotype is slightly teneral.) Carapace pale orange yellow, dusky in cephalic region. Femora of legs about same color as carapace. Legs darkened distally. Legs with annulations on ventral side of femora; annulations circling leg segments distad of femora. Palpi same color as legs. Chelicerae pale orange. Endites of palpi and labium pale orange brown. Sternum dusky, darker than coxae. Opisthosoma gray. Dorsum with indistinct folium anteriorly, chevrons posteriorly.

Structure. Total length 5.1 mm. Carapace 2.9 mm long, 1.7 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE about twice as large as AME.

Female. Color. Carapace orange, darkened anteriorly. Posterior part of cephalic region with broad, pale V at margin of cervical groove as in C. tibialis. Femora of legs paler than carapace. Legs distinctly darkened distally. Femora of legs with annulations on ventral side. Palpi colored as legs. Chelicerae dark orange, almost red brown. Endites of palpi and labium slightly paler than chelicerae. Sternum pale brown, darker than coxae. Opisthosoma dark gray, as in male.

Structure. Total length about five to 8.5 mm.

Carapace extremes 2.5 to 3.5 mm long, 1.7 to 2.5 mm wide. AME smallest eyes, lateral eyes largest. AME almost diameter of one AME apart. ALE slightly less than twice as large as AME.

FIELD NOTES

The only male known for this species was collected in late August. Females were collected from April to September.

REMARKS

The name for this species is derived from parts of the locality names Washington, British Columbia, and Alaska, giving wa-brit-askus.

MATERIAL EXAMINED

Holotype♂; 15 ♀♀; 2 immatures.

DISTRIBUTION

Washington, north to British Columbia and coastal Alaska (Fig. 411).

RECORDS

CANADA

BRITISH COLUMBIA: Emerald Lake, Yoho National Park, 4300 ft. alt. (AMNH); 52 Mi. N.W. Manson Creek, 3200 ft. alt. (RL); Six Mile Lake, Cassiar Dist., N.E. New Hazelton, S. side Bulkley River (ROM).

UNITED STATES

ALASKA: Admiralty Island (CU); Haines (UU); Kodiak Island (ULS).

WASHINGTON: Grays Harbor County: 5 Mi. E. McCleary (AMNH); King County: Green River Gorge (HEF); Lake Semamish State Park (AMNH); Seattle (AMNH); Thurston County: Olympia (MCZ).

Callioplus spenceri Leech, new species

(Figs. 94 - 95, 286, 410)

Callioplus spenceri Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: WASHINGTON: Pierce County: Fairfax. 1350 ft. alt.
October 3, 1954. B. Malkin and A. Bryan, collectors.

DESCRIPTION

Male. Color. Carapace dull yellow orange, slightly dusky, paler in cephalic region than in thoracic. Femora of legs about same color as cephalic region of carapace. Legs distinctly annulated and darkened distally. Palpi about same color as legs. Chelicerae orange. Endites of palpi and labium about same color as legs distally. Sternum dusky yellow, darker than coxae. Opisthosoma dark gray. Dorsum with irregular, indistinct pale blotches anteriorly, distinct chevrons posteriorly.

Structure. Total length 5.3 mm. Carapace 2.9 mm long, 2.1 mm wide. AME smallest eyes, ALE largest. AME slightly more than radius of one AME apart. ALE about 1.5 times as large as AME.

Female. Color. Carapace uniform orange, except for broad, pale V at central posterior part of cephalic region along cervical groove.

Carapace with light dusky streaks. Femora of legs about same color as carapace. Legs distinctly annulated and darkened distally. Chelicerae orange. Endites of palpi and labium brown orange. Sternum dusky orange, darker than coxae. Opisthosoma pale blotchy green gray. Dorsum with indistinct pale spots decreased in size posteriorly.

Structure. Total length 6.8 mm. Carapace 2.7 mm long, 1.95 mm wide. AME smallest eyes, ALE largest. AME less than radius of one AME apart. ALE about 1.5 times as large as AME.

REMARKS

This species is named after the late Professor Emeritus George J. Spencer, of the Zoology Department, University of British Columbia, the man who educated many of North America's most prominent biologists.

MATERIAL EXAMINED

Holotype ♂; 1 ♀.

DISTRIBUTION

Western Washington (Fig. 410).

RECORDS

WASHINGTON: Pierce County: Fairfax, 1350 ft. alt. (AMNH); Snohomish County: Stillaguamish River (HEF).

Callioplus pantoplus Bishop and Crosby

(Figs. 96 - 97, 287 - 288, 413)

Callioplus pantoplus Bishop and Crosby, 1935:46.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: TENNESSEE: Sevier County: Laurel Creek. October 26, 1926. C.R. Crosby and S.C. Bishop, collectors.

Callioplus pantoplus:Chamberlin, 1947:18. Roewer, 1954:1364. Bonnet, 1956:935.

DESCRIPTION

Male. Color. Carapace orange with pale, dusky V at central posterior area of cephalic region along cervical groove. Femora of legs slightly paler than carapace. Legs darkened distally. Palpi, except for darker cymbium, paler than legs. Chelicerae darker orange than carapace, almost brown. Endites of palpi and labium pale orange brown. Sternum yellow, darker than coxae. Opisthosoma pale gray. Dorsum with paired white spots decreased in size posteriorly (not visible in faded specimens).

Structure. Total length about three to 4.5 mm. Carapace extremes 1.7 to 2.1 mm long, 1.2 to 1.5 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE slightly more than twice as large as AME.

Female. Color. Carapace orange, darkened slightly anteriorly. Femora of legs paler than carapace. Legs darkened distally. Palpi colored as legs. Chelicerae orange, almost brown. Endites of palpi and

labium brown. Sternum yellow orange, darker than coxae. Opisthosoma dark gray. Dorsum with indistinct or distinct paired white spots decreased in size posteriorly.

Structure. Total length about three to 5.5 mm. Carapace extremes 1.2 to 2.2 mm long, 0.9 to 1.5 mm wide, average 1.7 mm long, 1.2 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE about twice as large as AME.

REMARKS

Most of the representatives of this species are badly damaged, incomplete and/or much faded. Average size of females is less than that of males, as noted by Bishop and Crosby (1935:47).

MATERIAL EXAMINED

Holotype ♂; 4 ♂♂; 35 ♀♀; 8 immatures.

DISTRIBUTION

Appalachian Mountains area in Georgia, Kentucky, North Carolina, and Tennessee (Fig. 413).

RECORDS

GEORGIA: Towns and Rabun County Line: Top of Blue Ridge (CU).

KENTUCKY: Jackson County: Quicksand (AMNH) (UU).

NORTH CAROLINA: "Clay County" (AMNH); Swain County: Newfound Gap, 5048 ft. alt. (MCZ).

TENNESSEE: "Blount County" (AMNH); Morgan County: Brushy Mountain

(AMNH); Sevier County: Laurel Creek (AMNH); Sides of Mt. LeConte (AMNH); Newfound Gap, Appalachian Trail, Great Smoky Mtn Nat. Park, 2000 m. alt. (MCZ).

Callioplus hoplites (Bishop and Crosby)

(Figs. 98 - 99, 289, 414)

Amaurobius hoplites Bishop and Crosby, 1926:171.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: NORTH CAROLINA: Buncombe County: Montreat.

October 16, 1923. C.R. Crosby and S.C. Bishop,
collectors.

Callioplus hoplites: Bishop and Crosby, 1935:45. Chamberlin, 1947:17.

Roewer, 1954:1363. Bonnet, 1956:935.

DESCRIPTION

Male. Color. Carapace pale yellow orange. Cephalic region paler than thoracic region, and with dusky V at central area of cephalic region on cervical groove. Femora of legs about same color as carapace. Legs darkened distally. Palpi, except for darker tibiae and cymbia, paler than legs. Chelicerae dull orange. Endites of palpi and labium pale orange. Sternum yellow, as dark as or darker than coxae. Opisthosoma green gray. Dorsum unmarked or with indistinct paired pale spots decreased in size posteriorly.

Structure. Total length about three to four mm.

Carapace extremes 1.5 to 1.9 mm long, 1.15 to 1.3 mm wide. AME smallest

eyes, ALE largest. AME extremely small, about diameter of one AME apart. ALE almost three times as large as AME.

Female. Color. Carapace yellow orange, darkened anteriorly. Cephalic region with circular pale area at posterior margin along cervical groove. Femora of legs about same color as thoracic region of carapace. Legs darkened distally. Palpi colored as legs. Chelicerae dull orange. Endites of palpi and labium pale brown orange. Sternum yellow, darker than coxae. Opisthosoma gray or green gray. Dorsum with indistinct paired pale spots decreased in size posteriorly.

Structure. Total length about three to five mm. Carapace extremes 1.5 to 1.8 mm long, 1.1 to 1.3 mm wide. Eyes as in male.

FIELD NOTES

Specimens of this species were found in leaf litter in dense woods (Bishop and Crosby, 1926:172). Males and females were collected in April, September, and October.

REMARKS

The males of this species are very similar to those of C. hoplomachus.

MATERIAL EXAMINED

Holotype♂; 13♂♂; 36♀♀; 2 immatures.

DISTRIBUTION

Western North Carolina in Appalachian Mountains region (Fig. 414).

RECORDS

NORTH CAROLINA: Alexander County: Mt. Pisgah (UU); Buncombe County: Black Mountain (AMNH) (MCZ); Montreat (AMNH); Yancey County: Mt. Mitchell (AMNH); Mt. Mitchell, 5500 ft. alt. (MCZ); Balsam Gap, Mt. Mitchell, 5300 ft. alt. (MCZ).

Callioplus hoplomachus (Bishop and Crosby)

(Figs. 100, 290, 415)

Amaurobius hoplomachus Bishop and Crosby, 1926:172.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: NORTH CAROLINA: Alexander County: Mt. Pisgah.
October 19, 1923. C.R. Crosby and S.C. Bishop,
collectors.

Callioplus hoplomachus: Bishop and Crosby, 1935:45. Chamberlin, 1947:17.

Roewer, 1954:1363. Bonnet, 1956:935.

DESCRIPTION

Male. Color. Carapace orange, darkened slightly anteriorly. Posterior part of cephalic region with circular pale area, and broad, dusky V along cervical groove. Femora of legs paler than carapace. Legs darkened distally. Palpi colored as legs. Chelicerae dull orange, darker than carapace.

Endites of palpi and labium light brown orange. Sternum dusky yellow, darker than coxae. Opisthosoma gray. Dorsum unmarked or with paired pale spots all about same size.

Structure. Total length about three to four mm.

Carapace extremes 1.4 to 2.0 mm long, 1.1 to 1.4 mm wide. AME smallest eyes, ALE largest. AME very small, about half the size of PME. AME almost two diameters of one AME apart. ALE almost four times as large as AME.

Female. Color. Color of female as in male.

Structure. Total length about three to five mm, average about 3.5 mm. Carapace extremes 1.55 to 2.1 mm long, 1.05 to 1.55 mm wide. AME smallest eyes, ALE largest. AME about half the size of PME. AME about diameter of one AME apart. ALE about three times as large as AME.

REMARKS

Most collected females of this species are teneral and/or faded. These specimens have the opisthosoma cream-colored and the carapace pale yellow orange.

FIELD NOTES

Specimens of this species were collected in leaf litter in dense woods (Bishop and Crosby, 1926:173). Males and females were collected in late September and October.

MATERIAL EXAMINED

Holotype ♂; 18 ♂♂; 27 ♀♀.

DISTRIBUTION

Western North Carolina (Fig. 415).

RECORDS

NORTH CAROLINA: Alexander County: base Mt. Pisgah (AMNH); Mt. Pisgah (AMNH); Frying Pan Gap, Mt. Pisgah (AMNH) (CU) (MCZ); Buncombe County: Montreat (UU); Macon County: Highlands (AMNH); "North Carolina" (UU).

Callioplus armipotens (Bishop and Crosby)

(Figs. 101, 291, 416)

Amaurobius armipotens Bishop and Crosby, 1926:170.

HOLOTYPE: Male, location unknown.

TYPE LOCALITY: NORTH CAROLINA: Avery County: Grandfather Mountain. October 12, 1923. C.R. Crosby and S.C. Bishop, collectors.

Callioplus armipotens: Bishop and Crosby, 1935:45. Chamberlin, 1947:17.

Roewer, 1954:1363. Bonnet, 1956:934.

DESCRIPTION

Male. Color. (All specimens are old and faded.) Carapace uniform orange except for pale V at central posterior margin of cephalic region along cervical groove. Femora of legs distinctly paler than carapace. Legs darkened slightly distally. Palpi about same color as legs. Chelicerae dull orange, darker than carapace. Endites of palpi and labium pale orange. Sternum yellow, darker than coxae. Opisthosoma

cream-colored or gray. Dorsum with paired pale spots decreased in size posteriorly. Older adult males with large, oblong white spots between book lungs and spinnerets.

Structure. Total length about 2.5 to 3.5 mm. Carapace extremes 1.5 to 1.7 mm long, 1.05 to 1.2 mm wide. AME smallest eyes, ALE largest. AME slightly more than radius of one AME apart. ALE about twice as large as AME.

Female. Color. Female colored as male.

Structure. Total length about three to five mm. Carapace extremes 1.6 to 2.0 mm long, 1.1 to 1.3 mm wide. AME smallest eyes, ALE largest. AME very small, half the size or smaller of PME. AME about 1.5 to 2 diameters of one AME apart. ALE about three or four times as large as AME.

FIELD NOTES

Members of this species were collected in leaf litter under laurels in dense woods (Bishop and Crosby, 1926:171). Males of this species were collected in October, females in April and October.

MATERIAL EXAMINED

11 ♂♂; 17 ♀♀; 18 immature.

DISTRIBUTION

Western North Carolina (Fig. 416).

RECORDS

NORTH CAROLINA: Avery County: Grandfather Mountain (CU); Graham County: Deep Creek, 4 Mi. N. Bryson City (AMNH); Macon County: "Macon County" (UU); Highlands (AMNH); Macon-Jackson County Line: 5 Mi. S. Cashiers at Cowee Gap (JAB); 3 Mi. S. Cashiers on U.S. 64 (JAB); 5 Mi. N. Highlands on U.S. 64, at Cowee Gap (JAB); Watauga County: Blowing Rock (CU); Calloway Peak (AMNH).

Genus Pimus Chamberlin

Pimus Chamberlin, 1947:19.

TYPE SPECIES: Pimus pitus Chamberlin, 1947:20, by original designation.

REMARKS

Members of the genus Pimus are closely related to members of the genera Amaurobius and Zanomys, and differ from them mainly in characteristics of the genitalia.

The genus name Pimus was proposed by Chamberlin (1947:19) to include four species, namely P. fractus (Chamberlin), P. hesperellus Chamberlin, P. leucus Chamberlin, and P. pitus Chamberlin. This study increases the included species to ten.

The genus Pimus is a western Nearctic endemic, the species of which are known only from California and Oregon.

DIAGNOSIS OF THE GENUS Pimus

AME distinctly smaller than PME. Epigynum with posterior lobe fully exposed, with no sclerotized parts within epigastric furrow. Main face of epigynum directed posteroventrally. Middle of face of posterior lobe with rounded, darkened bulge pointed posteroventrally (see Figs. 293, 302). Cribellum bipartite. Palpal tibia of male with two simple, ectal processes, upper process larger and near middle of tibia, lower process smaller and subapical. Embolus origin in basal half of cymbium, continued forward medially and curved around distal

end of palpal organ. Tip of embolus pointed posteriorly. Femora I in male and female bearing two spines distally on anterior side. Coxa of Leg I of male apically with rounded protuberance anteroventrally. Calamistrum present in female, absent or vestigial in male. Calamistrum in female delimited at each end by leg spine.

Pimus pitus Chamberlin

(Figs. 102 - 104, 292 - 293, 417)

Pimus pitus Chamberlin, 1947:20.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Mariposa County: Wawona Camp, Yosemite National Park. September 17, 1941. W. Ivie, collector.

Pimus pitus:Roewer, 1954:1371. Lehtinen, 1967:259. Vogel, 1967:16, 18.

Walmus varus Chamberlin, 1947:16.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Tulare County: 12 Mi. N.E. Hammond in Sequoia National Park. 4000 ft. alt. March 22, 1941. S. and D. Mulaik, collectors. NEW SYNONYMY.

Walmus varus:Roewer, 1954:1376. Vogel, 1967:20.

NOTES ON SYNONYMY

The processes on the palpal tibia and median apophysis of the holotype of Walmus varus are nearly identical to those of the holotype of Pimus pitus, and fit well within the variation from near the type locality.

DESCRIPTION

Male. Color. Carapace uniform orange. Femora of legs slightly paler than carapace. Legs darkened distally. Palpi colored as legs. Chelicerae orange, slightly darker and duller than carapace. Endites of palpi and labium pale orange. Sternum yellow, slightly darker than coxae. Opisthosoma green gray or dark gray. Dorsum with two pairs of pale spots anteriorly, and chevrons posteriorly.

Structure. Total length about six to 7.5 mm. Carapace extremes 2.95 to 3.8 mm long, 2.2 to 2.7 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. PME about diameter of one PME apart. ALE slightly less than twice as large as AME.

Female. Color. Female colored as male except carapace darkened in cephalic region, chelicerae light chestnut brown, and endites of palpi and labium light brown.

Structure. Total length about 6.5 to 8.5 mm. Carapace extremes 3.2 to 4.0 mm long, 2.1 to 2.7 mm wide. Eyes approximately as in male.

FIELD NOTES

Teneral and fully adult males of this species were collected in September only. Females were collected from May to October.

REMARKS

Epigyna of slightly teneral and very old females differ markedly from one another in degree of pigmentation.

Chamberlin (1947:16) gives the type locality of Walmus varus as "California: 2 Mi. N.E. Hammond, March 23, 1941." This locality is in doubt as a small, handwritten label (by S. Mulaik) contained in the vial with the holotype of Walmus varus reads "12 Mi. N.E. Hammond Calif 4000' 3-22-41 S.-D. Mulaik". These data place the collecting locality well within the boundary of Sequoia National Park. Mulaik (in litt., about August 7, 1969) wrote me that his log book for March 22, 1941, reads "Collecting in Sequoia Nat'l Park. Left Camp at 2:30 PM". His notes for March 21, 1941, read "Buckeye Flat Campground", a locality that is in Sequoia National Park.

"HAMMOND" is at the junction of Highway 198 and Mineral King Road, or about 2.8 miles southwest of Ash Mountain Entrance to Sequoia National Park. The 1967 edition of the Chevron-Standard Oil Company road map shows Hammond as being at the junction of Highway 198 and Mineral King Road. Vogel (1967:20) cites the type locality of W. varus as "California, Fresno Co., 2 Mi. northeast of Hammond [on the AT and SF railroad]." This information is incorrect.

Lehtinen's figure 161 (1967:442) of the epigynum of this species is inaccurate.

MATERIAL EXAMINED

Holotype ♂; Holotype ♂ Walmus varus; 21 ♂♂; 62 ♀♀; 26 immatures.

DISTRIBUTION

Sierra Nevada region of California (Fig. 417).

RECORDS

CALIFORNIA: Amador County: 5 Mi. N. Mokelumne Drive (AMNH); Calaveras County: Shaw's Cave (AMNH); El Dorado County: 4 Mi. W. Kyburz (AMNH); Fresno County: Cedar Grove, Kings Canyon National Park (AMNH); Wilsonia, Kings Canyon National Park (AMNH); 3 Mi. N. Pinehurst (AMNH); Shaver Lake (AMNH); Madera County: 2 Mi. S. Fish Camp (AMNH); 5 Mi. S. Fish Camp (AMNH); 5 Mi. S. Fish Camp, just over county Line (AMNH); Northfork (AMNH); Mariposa County: Fish Camp (AMNH); 1 Mi. S. Fish Camp (AMNH); Grouse Creek, Yosemite National Park (AMNH); Wawona Camp, Yosemite National Park (AMNH); Yosemite Falls, Yosemite National Park (CU); Tulare County: nr Ash Mtn, Sequoia National Park (AMNH); 7 Mi. N.E. Ash Mtn Entrance, Sequoia National Park (AMNH); 3 Mi. W. Giant Forest, Sequoia National Park (AMNH); Soda Creek, nr. Nelson Camp (AMNH); Tuolumne County: 12 Mi. E. Buck Meadows on Hwy 120 (AMNH); Yolo County: 3 Mi. N. Rumsey (AMNH).

Pimus iviei Leech, new species

(Figs. 105 - 106, 294 - 295, 417)

Pimus iviei Leech, new species.

HOLOTYPE: Male, CAS.

TYPE LOCALITY: CALIFORNIA: Humboldt County: Horse Mountain, 15 Mi. S.W. Willow Creek. 4950 ft. alt. Collected 9.VIII.1968 as penultimate; emerged 1.IX.1968 as adult. R.E. and A.V. Leech. Under bark of pine log.

DESCRIPTION

Male. Color. Carapace uniform pale yellow orange. Femora of legs paler than carapace. Legs darkened distally. Palpi, except for dark processes, colored as legs. Chelicerae orange, darker than carapace. Endites of palpi and labium pale orange. Sternum yellow, brighter than coxae. Opisthosoma blotchy cream white and green gray. Dorsum with two pairs of pale spots anteriorly, chevrons posteriorly.

Structure. Total length about 4.8 to six mm. Carapace extremes 2.4 to 2.7 mm long, 1.8 to 2.0 mm wide. AME smallest eyes, ALE largest. AME separation distance variable, slightly less to slightly more than diameter of one AME apart. ALE about 1.5 to two times as large as AME. PME separation distances as AME.

Female. Color. Female colored much as in male except carapace darkened slightly anteriorly, and some females with dorsum of opisthosoma unmarked.

Structure. Total length about 4.5 to six mm. Carapace extremes 2.0 to 2.9 mm long, 1.25 to 2.0 mm wide. Eyes as in male.

FIELD NOTES

Males of this species were collected from July to September.
Females were collected from June to September.

REMARKS

This species is named after the late Mr. Wilton Ivie, who was one of the best North American spider specialists. The holotype is

slightly teneral.

MATERIAL EXAMINED

Holotype ♂; 2 ♂♂; 12 ♀♀; 4 immatures.

DISTRIBUTION

Northern California (Fig. 417).

RECORDS

CALIFORNIA: Del Norte County: Junction of Dunn and East Fork Illinois River (CAS); Patrick (AMNH); Humboldt County: 6 Mi. N. Hoopa (AMNH); Horse Mountain, 15 Mi. S.W. Willow Creek, 4950 ft. alt. (CAS); Modoc County: Joseph Creek, 15 Mi. N. Alturas (AMNH); Shasta County: 8 Mi. S. Dunsmuir (AMNH); Trinity County: 11 Mi. E. Douglas City (AMNH); 2 Mi. E. Hayfork Summit (AMNH).

Pimus napa Leech, new species
(Figs. 107 - 108, 296 - 297, 418)

Pimus napa Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Napa County: 3 Mi. N. Calistoga.

December 31, 1953. G.A. Marsh, R.O. Schuster, and
V.D. Roth, collectors.

DESCRIPTION

Male. Color. Carapace uniform orange. Femora of legs slightly paler than carapace. Legs darkened distally. Palpi, except for darker tibial processes, about same color as legs. Chelicerae about same color as carapace. Endites of palpi and labium light orange brown. Sternum yellow, brighter than coxae. Opisthosoma solid gray or with blotchy cream-colored and gray markings. Dorsum unmarked, with folium, or with paired pale spots anteriorly, chevrons or paired pale spots posteriorly.

Structure. Total length about 5.5 to seven mm. Carapace extremes 2.7 to 3.4 mm long, 2.0 to 2.4 mm wide. AME smallest eyes, ALE largest. ALE slightly less than twice as large as AME. PME slightly less than diameter of one PME apart.

Female. Color. Female colored as male except carapace darkened anteriorly, chelicerae light chestnut brown, and sternum dusky yellow, darker than coxae. Legs of some specimens with pale annulations.

Structure. Total length about 5.5 to eight mm. Carapace extremes 2.5 to 3.4 mm long, 1.7 to 2.3 mm wide. Eyes about as in male except PME slightly more than diameter of one PME apart.

REMARKS

The name for this species is derived from the southern Patwin Indian word napa, meaning grizzly bear (according to Kroeber, as quoted by Gudde, 1969:217). The locality "10 Mi. S. Monticello, Napa County" can no longer be determined as the town of Monticello is now under Lake Berryessa, a reservoir.

MATERIAL EXAMINED

Holotype ♂; 18 ♂♂; 53 ♀♀; 52 immatures.

DISTRIBUTION

Solano and Napa Counties northwest to Del Norte County, California (Fig. 418).

RECORDS

CALIFORNIA: Del Norte County: Gasquet (AMNH); Humboldt County: Garberville (AMNH); Miranda (AMNH); Richardson Grove Redwood State Park (AMNH); Mendocino County: 5 Mi. E. Anchor Bay (AMNH); Elk (AMNH); Leggett (AMNH); 4.1 Mi. S.W. Leggett on top of grade (AMNH); Navarro Ridge Road (AMNH); 4.2 Mi. S. Piercy (AMNH); 5 Mi. N. Piercy (AMNH); Napa County: 3 Mi. N. Calistoga (AMNH); 10 Mi. S. Monticello (AMNH); 2 Mi. W. Oakville (AMNH); 3 Mi. W. Oakville (AMNH); 4 Mi. W. Oakville (AMNH); 7 Mi. W. Oakville (AMNH); 4 Mi. N. St. Helena (AMNH); Mt. St. Helena (AMNH) (CAS); Toll Road on Mt. St. Helena (AMNH); Wooden Valley (AMNH); Solano County: Green Valley (AMNH); Sonoma County: 3 Mi. W. Glen Ellen (AMNH); 2 Mi. W. petrified forest (AMNH).

Pimus fractus (Chamberlin)

(Figs. 109 - 110, 298 - 299, 419)

Amaurobius fractus Chamberlin, 1920:293.

HOLOTYPE: Female, MCZ. Type No. 501.

TYPE LOCALITY: CALIFORNIA: Los Angeles County: Claremont.

Amaurobius fractus:Bonnet, 1955:288.

Pimus fractus:Chamberlin, 1947:19. Roewer, 1954:1371.

Walmus oblitus Chamberlin, 1947:16.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Santa Cruz County: Brookdale. March,
1913. R.V. Chamberlin, collector. NEW SYNONYMY.

Walmus oblitus:Roewer, 1954:1376. Vogel, 1967:20.

NOTES ON SYNONYMY

It is not apparent from Chamberlin's drawings (1947:Figs. 23 and 29) that Walmus oblitus and Pimus fractus are even closely related to one another. The two drawings are of different perspectives of epigyna of the same species. Although there is a slight difference in the degree of pigmentation between the two epigyna, they are morphologically indistinguishable from one another.

DESCRIPTION

Male. Color. Carapace uniform yellow orange. Femora of legs slightly paler than carapace. Legs darkened distally. Legs with pale annulations. Palpi, except dark tibial processes, colored as legs. Chelicerae dull orange. Endites of palpi and labium pale brown orange. Sternum dusky yellow, darker than coxae. Opisthosoma gray. Dorsum with two pairs of spots anteriorly, chevrons posteriorly.

Structure. Total length about five to 5.5 mm. Carapace extremes 2.3 to 2.75 mm long, 1.8 to 2.0 mm wide. AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE

slightly less than twice as large as AME.

Female. Color. Female colored as male except carapace darkened in cephalic region. Opisthosoma as in male or unmarked.

Structure. Total length about five to 6.5 mm. Carapace extremes 2.0 to 3.0 mm long, 1.5 to 2.0 mm wide. AME smallest eyes, ALE largest. AME about 1 to 1.25 diameters of one AME apart. ALE about twice as large as AME.

FIELD NOTES

Males of this species were collected from December to March. Females were collected throughout the year. Specimens were found in redwood-oak leaf litter.

REMARKS

The male is described here for the first time.

MATERIAL EXAMINED

Holotype ♀; Holotype ♀ Walmus oblitus; 6 ♂♂; 21 ♀♀; 16 immatures.

DISTRIBUTION

Northern, central coastal, and southern California (Fig. 419).

RECORDS

CALIFORNIA: Alameda County: Calaveras Dam (AMNH); 21 Mi. S.E. Livermore on Mines Road (AMNH); Niles, off Niles Canyon on Palomres Road

(AMNH); San Benito County: 4 Mi. W. San Juan Bautista (AMNH); San Mateo County: S. of Woodside (AMNH); Santa Clara County: Mt. Madonna (AMNH); Mt. Madonna, E. of Watsonville (AMNH); 2 Mi. N. Holy City (AMNH); Stevens Creek (AMNH); Santa Cruz County: Ben Lomond (AMNH); Big Basin Redwood State Park (PRC); Boulder Creek (AMNH); 6 Mi. N.E. Boulder Creek (AMNH); 12 Mi. N. Boulder Creek (AMNH); Brookdale (AMNH); Felton (AMNH); Siskiyou County: China Creek at Klamath River (AMNH).

Pimus desiccatus Leech, new species

(Figs. 111 - 112, 300, 419)

Pimus desiccatus Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Sierra County: Monarch Mine, Sierra City. September 7, 1959. W.J. Gertsch and V.D. Roth, collectors.

DIAGNOSIS

The very short ventral process on the palpal tibia on males of this species distinguishes it from all other species in the genus Pimus in the Nearctic Region.

DESCRIPTION

Male. Color. Carapace uniform yellow orange. Femora of legs paler than carapace. Legs darkened distally. Palpi, except for darker processes, same color as legs. Chelicerae dull orange. Endites of palpi and labium about same color as legs distally. Sternum pale yellow

orange, darker than coxae. Opisthosoma cream white, unmarked.

Structure. (Only one male was measured as others were dried and shrivelled.) Total length 5.8 mm. Carapace 2.6 mm long, 1.9 mm wide. AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE about twice as large as AME. PME slightly more than diameter of one AME apart.

Female. Color. Female colored about as in male.

Structure. (All females have been dried and shrivelled.) Total length about 4 to 5 mm. Eyes as in male.

REMARKS

The name for this species is derived from the Latin word desiccatus, meaning dried. This is in reference to the fact that most of the paratypes are dried and shrivelled.

MATERIAL EXAMINED

Holotype ♂; five ♂♂; six ♀♀; five immatures.

DISTRIBUTION

Sierra County, California (Fig. 419).

RECORDS

CALIFORNIA: Sierra County: Monarch Mine, Sierra City (AMNH); The Cups, Sierra City (AMNH).

Pimus nautawaketus Leech, new species

(Figs. 301 - 302, 418)

Pimus nautawaketus Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Shasta County: Samwell Cave, Shasta Lake. April 2, 1960. W.J. Gertsch and R. Schrammel, collectors.

DESCRIPTION

Male. Unknown

Female. Color. Carapace orange, darkened slightly anteriorly. Femora of legs paler than carapace. Legs darkened distally. Palpi colored as legs. Chelicerae light chestnut brown. Endites of palpi and labium light brown. Sternum pale orange, darker than coxae. Opisthosoma almost cream white. Dorsum with faint chevrons posteriorly.

Structure. Total length 7.1 mm. Carapace 2.5 mm long, 1.8 mm wide. AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE about twice as large as AME. PME slightly more than diameter of one PME apart.

REMARKS

The name for this species is derived from the Wintu Indian words naw, meaning south, and waket, meaning creek (Gudde, 1969:218), hence nautawaketus. I have used this species name as there will be little chance of confusion between it and any other species name. Samwell Cave

is near Shasta Lake near where Nosoni Creek enters the lake. It can be reached by road. The holotype female is gravid.

MATERIAL EXAMINED

Holotype ♀.

Pimus salemensis Leech, new species

(Figs. 303 - 304, 420)

Pimus salemensis Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: OREGON: Marion County: Salem. January 1, 1955.

V.D. Roth, collector.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace orange, darkened slightly anteriorly. Femora of legs paler than carapace. Legs darkened distally. Legs with pale annulations. Palpi colored as legs. Chelicerae light chestnut brown. Endites of palpi and labium light orange brown. Sternum dusky yellow, darker than coxae. Opisthosoma patchy cream white and green gray. Dorsum with two pairs of small pale spots anteriorly, chevrons posteriorly.

Structure. Total length 5.5 mm. Carapace 2.35 mm long, 1.6 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE slightly less than twice as large as AME. PME slightly

more than diameter of one PME apart.

REMARKS

The name for this species is derived from the town name Salem in Oregon, and refers to the type locality. The carapace of the holotype is cracked and two legs, left side, Legs I and IV, are broken off at the coxae.

MATERIAL EXAMINED

Holotype ♀.

Pimus hesperellus Chamberlin

(Figs. 305 - 306, 421)

Pimus hesperellus Chamberlin, 1947:19.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Shasta County: Squaw Creek (approx. 40°43'N, 122°29'W). July 15, 1937. R.V.

Chamberlin, collector. (See also discussion under REMARKS.)

Pimus hesperellus:Roewer, 1954:1371. Vogel, 1967:18.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace pale yellow orange, very slightly darkened anteriorly. Femora of legs paler than carapace. Legs darkened

distally. Palpi colored as legs. Chelicerae orange. Endites of palpi and labium light brown orange. Sternum yellow, darker than coxae. Opisthosoma gray. Dorsum with two pairs of pale spots anteriorly, chevrons posteriorly.

Structure. Total length 5.1 mm. Carapace 2.3 mm long, 1.6 mm wide. AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE almost twice as large as AME. PME approximately diameter of one PME apart.

REMARKS

Chamberlin (1947) did not publish the type locality data for this species. However, the vial containing the type specimen reads,

" HOLOTYPE 122.40 nw
CALIFORNIA: Squaw Creek.
July 15, 1937. R.V.
Chamberlin coll."

Gudde (1969:319) reports, "There are very few counties in the State that do not have at least one Squaw Valley, Creek, Canyon, Hill, or Hollow." However, the label in the vial in question reads, "122.40 nw". This is the standard method of designating an area by R.V. Chamberlin and W. Ivie, and places the type locality in either Trinity or Shasta County. I cannot find a "Squaw Creek" in southeastern Trinity County, but there are two "Squaw Creeks" entering Shasta Lake (reservoir). The more probable of these two localities is the Squaw Creek entering Shasta Lake about three or four miles west of Shasta Dam (approx: 40°43'N, 122°29'W), which is easily reached by road from Redding. The other locality is on a northeastern arm of the lake (approx.: 40°47'N, 122°06'W).

MATERIAL EXAMINED

Holotype ♀; 1 ♀.

DISTRIBUTION

Shasta County, California (Fig. 421).

RECORDS

CALIFORNIA: Potter Creek Cave, Shasta Lake (AMNH); Squaw Creek (AMNH).

Pimus eldorado Leech, new species

(Figs. 307 - 308, 420)

Pimus eldorado Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: El Dorado County: 5 Mi. W. Pollock
Pines. July 6, 1958. V.D. Roth, collector.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace orange, darkened slightly anteriorly. Femora of legs paler than carapace. Legs darkened distally. Palpi colored as legs. Chelicerae light chestnut brown. Endites of palpi and labium light brown. Sternum orange yellow, about same color as coxae. Opisthosoma patchy cream white and dark green gray. Dorsum marked with two pairs of pale spots anteriorly, chevrons posteriorly.

Structure. Total length about 5.5 to seven mm.

Carapace extremes 2.2 to 3.0 mm long, 1.55 to 1.9 mm wide. AME smallest eyes, ALE largest. AME slightly more than radius of one AME apart. ALE about 1.5 times as large as AME. PME slightly more than diameter of one PME apart.

FIELD NOTES

Females of this species were collected in April and July. An egg sac, collected with the holotype female, contained 33 eggs (and three millipede larvae - eating eggs?). The egg sac is typical - made of flocculent white silk and covered with debris.

REMARKS

The name for this species is derived from the Spanish words el dorado, meaning the gilded one (Gudde, 1969:99). This is in reference to the golden color reflected from the carapace of the female holotype when viewed with the naked eye.

MATERIAL EXAMINED

Holotype ♀; two ♀♀; two immatures.

DISTRIBUTION

Butte and El Dorado Counties, California (Fig. 420).

RECORDS

CALIFORNIA: Butte County: 10 Mi. E. Oroville, Feather River Canyon

(AMNH); El Dorado County: 5 Mi. W. Pollock Pines (AMNH); Riverton (AMNH).

Pimus leucus Chamberlin

(Figs. 309 - 310, 421)

Pimus leucus Chamberlin, 1947:20.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Siskiyou County: Mount Shasta. August
25, 1931. W. Ivie, collector.

Pimus leucus:Roewer, 1954:1371. Vogel, 1967:18.

DESCRIPTION

Male. Unknown.

Female. Color. (Specimen in poor condition and obviously much faded.) Carapace light orange, darkened slightly anteriorly. Femora paler than carapace. Legs darkened distally. Chelicerae orange, slightly brownish, darker than carapace. Endites of palpi and labium light brown orange. Sternum yellow, brighter than coxae. Opisthosoma cream white, unmarked.

Structure. Total length five to six mm. Carapace extremes 2.1 to 3.0 mm long, 1.3 to 2.05 mm wide. AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE about twice as large as AME. PME slightly more than diameter of one PME apart.

MATERIAL EXAMINED

Holotype ♀; 2 ♀♀; 2 immatures.

DISTRIBUTION

Northern California and southern Oregon (Fig. 421).

RECORDS

CALIFORNIA: Siskiyou County: Mt. Shasta (AMNH).

OREGON: Josephine County: 12 Mi. E. Cave Junction (AMNH).

Genus Amaurobius Koch

Amaurobius Koch, 1837:15.

TYPE SPECIES: Aranea fenestralis Ström, 1768:362, designated by Thorell, 1870:126.

Ciniflo Blackwall, 1841b:607.

TYPE SPECIES: Clubiona atrox Latreille, 1806:93, by original designation.

Walmus Chamberlin, 1947:10.

TYPE SPECIES: Walmus barbarus, new species, by original designation.
NEW SYNONYMY.

NOTES ON SYNONYMY

Levi and Kraus (1964) submitted a petition to have the family name Ciniflonidae placed on the Official Index of Rejected and Invalid Family-Group-Names in Zoology, for it is based on Ciniflo Blackwall, 1841b, a junior objective synonym of Amaurobius Koch, 1837.

The genus name Walmus Chamberlin, 1947, is a junior synonym of the genus name Amaurobius. Walmus barbarus Chamberlin, and the other species placed by Chamberlin in the genus Walmus, are transferred to the genus Amaurobius (see Figs. 262 - 271, 277 - 290 in Wiehle, 1953, for a comparison with European Amaurobius species).

REMARKS

Bonnet (1955:275 - 296) lists 85 species names in the genus Amaurobius, and Roewer (1954:1354 - 1359) lists 52 species names.

Lehtinen (1967:212) does not consider the number of species names, but states (1967:340) that the genus Amaurobius is Western Palearctic only. In this study, the genus Amaurobius is considered to be Holarctic. No species, excepting the synanthropic ones, are Holarctic in distribution.

The genus Amaurobius is closely related to the genera Zanomys and Pimus. In fact, the members of the genus Zanomys are so closely related to those of Amaurobius that it is with some hesitation that I retain the genus name Zanomys. The only significant reason I have for retaining the genus name Zanomys is that all the members of this genus are very small, much smaller than any members of the genus Amaurobius known to me.

Members of the genus Amaurobius differ from those of Pimus in details of the genitalia. Also, on male members of the genus Pimus there is an anteroventral, apical, rounded protuberance on Coxa I that is not present on members of the genus Amaurobius.

DIAGNOSIS OF THE GENUS Amaurobius

Cribellum bipartite. Male with three tibial processes (median process either one- or two-lobed or ridge-like). Embolus short, curved, terminated at most distal part of alveolus. Epigynum various, from large median and small lateral lobes to small median and large lateral lobes. Cribellum with origin about one-fifth distance from base of Metatarsus IV, and about half as long (or slightly less) as Metatarsus IV. Retromargin of fang furrow with three or four teeth, promargin with two or three teeth. Promargin also with brush or scopula. Chelicerae, especially in female, geniculate and robust. Femora with well-developed

dorsal and dorsolateral spines.

Key to the Males of the Species of Amaurobius
in the Nearctic Region

1. Median apophysis 0.50 mm long or longer 2
- Median apophysis at most 0.40 mm long 4
- 2 (1). Median apophysis distinctly bilobed, one lobe pointed, the
other rounded (Fig. 128) dorotheae (Chamb.), p. 188
- Median apophysis not bilobed, or at least one lobe markedly
longer than other 3
- 3 (2). Median apophysis more than twice as long as wide, hooked
distally barbaricus, new name, p. 203
- Median apophysis less than twice as long as wide, longer lobe
of even thickness, slightly arcuate .. ferox (Walck.), p. 179
- 4 (1). Median apophysis hooked or arcuate distally 5
- Median apophysis not hooked or arcuate distally, tapered to
blunt point distortus, new species, p. 207
- 5 (4). Median apophysis sharply pointed at distal end (Figs. 122,
147) 6
- Median apophysis blunt, spatulate, or rounded (Figs. 125,
154) 10
- 6 (5). Median apophysis distinctly less than 0.25 mm long, thin,
arcuate borealis Em., p. 182
- Median apophysis at least 0.30 mm long 7
- 7 (6). Median apophysis about twice as long as wide, gently curved, or
hooked, distally (Fig. 147) heathi (Chamb.), p. 201
- Median apophysis distinctly less than twice as long as wide,
arcuate 8

- 8 (7). Median apophysis fish hook-shaped, without flange on incurve near base (Fig. 138) tamalpais, new species, p. 194
- Median apophysis arcuate, tapered to fine point or pair of points (Figs. 125, 135, 160); large flange on incurve near base 9
- 9 (8). Median apophysis two pronged distally. Ectal process on palpal tibia about 0.15 mm long in lateral aspect
..... intermedius, new species, p. 212
- Median apophysis with single point distally. Ectal process on palpal tibia about 0.20 mm long in lateral aspect
..... tulare, new species, p. 192
- 10 (5). Median apophysis very broadly spatulate at tip (Fig. 125) agastus (Chamb.), p. 187
- Median apophysis not spatulate, but round, with or without small teeth or protuberances on incurve (Figs. 115, 144) . 11
- 11 (10). Palpal tibia from dorsal aspect with most mesal lobe of dorsal process long and thin, hooked distally (Fig. 113)
..... similis (Blkw11), p. 177
- Palpal tibia not as above 12
- 12 (11). Ectal process of palpal tibia from lateral aspect more than 0.25 mm long (Fig. 143) latescens (Chamb.), p. 198
- Ectal process of palpal tibia from lateral aspect less than 0.20 mm long (Figs. 130, 140) 13
- 13 (12). Ectal process of palpal tibia from lateral aspect distinctly elbowed near base; median apophysis as in Fig. 160
..... prosopidus, new species, p. 222
- Not as above 14

- 14 (13). Ectal process of palpal tibia sausage-shaped, rounded distally; median apophysis as in Fig. 132
 mathetes (Chamb.), p. 191
 - Ectal process of palpal tibia pointed distally; median apophysis as in Fig. 141 vexans, new species, p. 196

Amaurobius similis (Blackwall)

(Figs. 113 - 115, 311)

Ciniflo similis Blackwall, 1861:141.

HOLOTYPE: Male (location unknown).

TYPE LOCALITY: ENGLAND: "... abundantly distributed throughout the kingdom."

Amaurobius similis:Koch, 1868:14. Roewer, 1954:1357. Bonnet, 1955:293.

Leech, 1971:in press.

Amaurobius alaskanus Chamberlin and Ivie, 1947b:33.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: "ALASKA."

Amaurobius alaskanus:Vogel, 1967:17. Chamberlin and Ivie, 1947a:8, 9,

12.

Callobius alaskanus:Chamberlin, 1947:6. Lehtinen, 1967:220.

DIAGNOSIS

This is the only species of Amaurobius found in the Nearctic Region whose male members have a hooked mesal process distally on the palpal tibia.

DESCRIPTION

Male. Color. Carapace orange, darkened in cephalic region. Legs slightly paler than carapace. Femora and patellae same color as legs, tibiae and cymbium slightly darker. Chelicerae brown orange, darker than cephalic region of carapace. Endites of palpi, labium, and sternum about same color as legs. Opisthosoma with dark gray and yellow streaks. Dorsum with three pale stripes anteriorly, irregular and indistinct chevrons posteriorly.

Structure. Total length about seven to 8.5 mm. Carapace about 1.35 times as long as wide. AME slightly larger than or subequal to ALE in size. AME slightly more than radius of one AME apart. AME distinctly larger than PME.

Female. Color. Carapace light orange, darkened in cephalic region to brown orange. Legs with pale annulations. Legs paler than carapace. Legs I darker distally. Palpi like Legs I in color. Chelicerae chestnut brown. Endites of palpi and labium brown. Sternum about same color as coxae. Opisthosoma with gray and yellow irregular streaks. Dorsum with lateral pale stripes anteriorly, indistinct chevrons posteriorly.

Structure. Total length about 10 to 12 mm. Carapace about 1.4 to 1.5 times as long as wide. AME subequal to ALE in size. AME slightly more than radius of one AME apart. AME larger than PME.

REMARKS

This is a common European species. Leech (1971:in press) synonymized A. alaskanus with A. similis. The record of the holotype of Amaurobius alaskanus from Alaska is the first and only Nearctic record to date. The other specimens examined are all from Europe.

MATERIAL EXAMINED

Holotype ♂ Amaurobius alaskanus; four ♂♂; seven ♀♀.

Amaurobius ferox (Walckenaer)

(Figs. 116 - 117, 312, 422)

Clubiona ferox Walckenaer, 1830:156.

Amaurobius ferox:Koch, 1839:41. Emerton, 1888:451. Chamberlin, 1947:6.

Roewer, 1954:1357. Bonnet, 1955:284. Lehtinen, 1967:

212. Leech, 1971:in press.

Amaurobius peninsulanus Banks, 1898:232.

TYPE SERIES: 1 ♂, 1 ♀, (location unknown).

TYPE LOCALITY: MEXICO: Baja California: San Jose del Cabo.

Amaurobius peninsulanus:Chamberlin, 1947:24 (figures only). Lehtinen,

1967:212.

DESCRIPTION

Male. Color. Carapace pale orange, darkened slightly anteriorly. Legs about same color as thoracic region of carapace. Palpi about same color as legs, with tibiae of some specimens darker

than legs. Chelicerae solid orange, slightly darker than cephalic region of carapace. Endites of palpi and labium about same color as dorsal side of legs. Sternum same color as coxae. Opisthosoma pale or dark gray. Dorsum with lateral stripes anteriorly, distinct or indistinct chevrons posteriorly.

Structure. Total length about eight to 12.5 mm. Carapace about 1.25 to 1.35 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME larger than PME.

Female. Color. Carapace orange in thoracic region, darkened to red in cephalic region. Legs about same color as thoracic region of carapace. Legs darkened slightly distally. Palpi same as Legs I. Chelicerae dark brown red, almost black. Endites of palpi and labium brown. Sternum same color as coxae. Opisthosoma gray to gray black. Dorsum with pale lateral stripes anteriorly, chevrons posteriorly.

Structure. Total length about 8.5 to 14 mm. Carapace about 1.4 to 1.6 times as long as wide. AME about diameter of one AME apart. AME smaller than ALE. AME larger than PME.

REMARKS

The first collecting record for a member of this species in the Nearctic Region is Providence, Rhode Island. November 8, 1871. This species is endemic to Europe. Adults of this species were collected throughout the year, usually in or around houses, but also under stones, bricks, and boards.

MATERIAL EXAMINED

57♂♂; 138♀♀; 54 immatures.

DISTRIBUTION

Nova Scotia west to Ontario and Michigan, southwest to Illinois and east to Virginia (Fig. 422).

RECORDS

CANADA

NOVA SCOTIA: Aldershot (AMNH).

ONTARIO: Ancaster (CNC); Swansea, west of High Park (UU); Toronto, north end of Grenadier Pond (AMNH); Toronto, High Park (AMNH) (ROM).

QUÉBEC: Montreal (CNC).

UNITED STATES

CONNECTICUT: Fairfield County: Redding (AMNH); New Haven County: New Haven (MCZ).

ILLINOIS: McLean County: Bloomington (AMNH).

MARYLAND: Montgomery County: Bethesda (AMNH); Washington County: Groundhog Cave, nr Black Rock (AMNH); Pinesburg Cave, along Canal at Pinesburg (AMNH); Schrampf Cave, nr Wilson (AMNH); Wilson Cave, nr Wilson (AMNH).

MASSACHUSETTS: Essex County: Salem (MCZ); Middlesex County: Cambridge (MCZ); Holliston (MCZ); Pepperell (MCZ); Norfolk County: Sharon (MCZ).

MICHIGAN: Calhoun County: Albion (MCZ).

NEW JERSEY: Bergen County: Mahwah (AMNH); Ramsey (AMNH); Mercer County: Princeton (AMNH).

NEW YORK: "New York State" (CU); Dutchess County: Poughkeepsie (MCZ); Kings County: Brooklyn (AMNH); Monroe County: Rochester (AMNH); Nassau County: Sea Cliff (MCZ); Queens County: Astoria (MCZ); Suffolk County: Coldspring Harbor (MCZ); Greenport (AMNH); Montauk (AMNH); Orient (AMNH); Southold Township (AMNH); Tompkins County: Ithaca (CU) (UU); Westchester County: Bronx (AMNH); Montrose (AMNH); Mount Vernon (AMNH).

OHIO: Cuyahoga County: Cleveland (AMNH); Franklin County: Columbus (OSUC); Hocking County: Cantwell Cliffs State Park (WAS); Ottawa County: Middle Bass Island (WAS).

PENNSYLVANIA: Adams County: Gettysburg (MCZ); Forest County: N.E. Jamison (AMNH); Northampton County: Easton (AMNH).

RHODE ISLAND: Providence County: Providence (MCZ).

VIRGINIA: Campbell County: Lynchburg (JEC); Fairfax County: Falls Church (MCZ); Montgomery County: Blacksburg (JEC).

WASHINGTON, D.C.: "Washington, D.C." (MCZ); Anacostia (USNM).

WEST VIRGINIA: "Ohio County" (AMNH).

Amaurobius borealis Emerton

(Figs. 118 - 122, 313 - 314, 423)

Amaurobius borealis Emerton, 1909:214.

LECTOTYPE: Here designated. Male, MCZ. Label reading:

"Lectotype Amaurobius borealis Emerton.
NEW HAMPSHIRE. Cheshire County: Fitzwilliam.
May 30, 1907."

TYPE LOCALITY: NEW HAMPSHIRE: Cheshire County: Fitzwilliam. May 30, 1907.

Amaurobius borealis: Emerton, 1920:324. Kurata, 1943:9. Bonnet, 1955:

276.

Walmus borealis:Chamberlin, 1947:12. Levi et al., 1958:52. Hackman, 1954:10, 93. Roewer, 1954:1375. Lehtinen, 1967:275. Freitag et al., 1969:1332.

Callioplus borealis:Kaston, 1948:519. Renault, 1968:iii, 7.

DESCRIPTION

Male. Color. Carapace uniform light brown. Femora of legs much paler than carapace. Legs darkened distally. Femora and patellae of palpi about same color as those of legs, but tibiae and cymbia much darker. Chelicerae browner than carapace. Endites of palpi and labium light brown. Sternum slightly less brown than labium, but much darker than coxae. Opisthosoma pale or dark gray. Dorsum with pale region in center anteriorly, with chevrons posteriorly, or unmarked.

Structure. Total length about 3.5 to five mm. Carapace extremes 2.1 to 2.2 mm long, 1.5 to 1.6 mm wide. AME smallest eyes, ALE largest. AME about radius of one AME apart. ALE almost twice as large as AME.

Female. Color. Carapace pale yellow brown, darkened slightly anteriorly. Otherwise colored as male.

Structure. Total length about 4.5 to six mm. Carapace extremes 1.9 to 2.2 mm long, 1.3 to 1.5 mm wide. AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE about twice as large as AME.

FIELD NOTES

Throughout the range, males have been collected from April to October, with mid May as the peak of activity. Females have been collected from May to November. Emerton (1909:214) reported finding females with eggs in July. Specimens of this species are found under logs and small stones, and in deep leaf litter of deciduous forests.

REMARKS

The members of this species are remarkably similar in size and proportions throughout the range.

MATERIAL EXAMINED

Lectotype♂; 135♂♂; 316♀♀; and 275 immatures.

DISTRIBUTION

Newfoundland west to British Columbia in Canada; Maine south to New York and west to Minnesota in the United States (Fig. 423).

RECORDS

CANADA

ALBERTA: Carrot Creek (AMNH); Devon (RL); Edmonton (RL) (ROM); George Lake (RL); House River at Little Smoky River (AMNH); Nakamun Lake, 12 Mi. N. Onoway (RL); Spring Creek Basin, 53°30'N, 117°40'W (RL).

BRITISH COLUMBIA: S.E. of Morely River Lodge, 59°57'W, 132°01'W (AMNH); Tupper (AMNH).

MANITOBA: Winnipeg (CNC).

NEW BRUNSWICK: Madawaska County: Fredericton (FFF); Green River Field

Station (FFF); Victoria County: Riley Brook (CNC).

NEWFOUNDLAND: Spruce Brook (MCZ). (Hackman (1954:94) reports many localities for this species in Newfoundland.)

ONTARIO: Batchawana (AMNH); Bear Island, Lake Timagami (AMNH) (ROM); Island 1024, Lake Timagami (ROM); Departure Lake, 8 Mi. W. Smooth Rock Falls, Cochrane District (MCZ); Minaki (MCZ); Mer Bleu (ROM); Nakina (ROM); South Tea Lake, Algonquin Provincial Park (UU); Hwy 11, 1 Mi. W. Kabaigon River, Thunder Bay District (RL); Klotz Lake, 30 Mi. E. Longlac (MCZ); Port Arthur (RL); Hwy 11/17, 11.5 Mi. E. Shebandowan (RL).

QUÉBEC: Hebertville (CU); Montreal (CNC); Mt. St. Pierre, Gaspé (ROM); North Hill, Mt. St. Hilaire (MU); Perce, Mt. Ste. Anne (AMNH).

SASKATCHEWAN: Lac La Ronge (ROM); Lady Lake (DJB).

UNITED STATES

MAINE: Aroostook County: Presque Isle (UU); Cumberland County: Long Island (MCZ); Portland (MCZ); Oxford County: North Woodstock (MCZ); Penobscot County: Sebasticook Lake (CU); Pistاقuis County: Baxter State Park, nr Sandy Stream Pond, 1500 ft. alt. (MCZ); Katahdin Camp, 3000 ft. alt. (MCZ).

MASSACHUSETTS: Berkshire County: Windsor (CU); Hampshire County: Huntington (MCZ); Worcester County: Holden (MCZ); Mt. Wachusett (MCZ).

MICHIGAN: Clare County: Harrison (MCZ); Mackinac County: Cheeseman's Road, nr St. Ignace (MCZ); Marquette County: Holyoke Trail (MCZ).

MINNESOTA: Hennepin County: Lake Minnetonka (CU).

NEW HAMPSHIRE: Carroll County: Crawford's (MCZ); Jackson (MCZ);

Cheshire County: Fitzwilliam (MCZ) (UU); Coos County: Mt. Washington, 1500 - 2500 ft. alt. (MCZ); Randolph (MCZ); Grafton County: Franconia

(MCZ).

NEW YORK: Clinton County: Burnt Hill (CU); Covey Hill Gulf (CU);
Courtland County: South Courtland (CU); Essex County: "Essex County"
 (UU); Highfalls (CU); Whiteface Trail, Wilmington (CU); Wilmington Notch
 (CU); Franklin County: Wabeek (CU); Hamilton County: Charly Lake (CU);
 Indian Lake (CU); Raquette Lake (CU); Speculator (CU); Herkimer County:
 Oldforge (CU); Lewis County: Whetstone Gulf (CU); Tompkins County:
 Connecticut Hill (CU); Danby (CU); Ithaca (CU); McLean (CU) (UU);
Warren County: Adirondack Lodge (CU); Brant Lake (CU); Yates County:
 Italyhill (CU); Undetermined localities: Stateville and Maratauz Lake
 (both CU).

PENNSYLVANIA: Potter County: Ice Mine (in mine) (WAS).

VERMONT: Caledonia County: North Danville (MCZ); Chittenden County:
 Mt. Mansfield (MCZ); Windham County: Jamaica (UU); Windsor County:
 Ascutneyville (MCZ).

WISCONSIN: Douglas County: N. of Solon Springs (MCZ); Florence County:
 Lost Lake Camp, Tipler (MCZ); Forest County: Franklin Lake (MCZ);
Marathon County: Hogarty (MCZ); N. slope Rib Mountain (MCZ); Price
County: West Prentice (MCZ); Sauk County: Leupold Memorial (MCZ);
Sawyer County: Flambeau State Forest (scientific area) (MCZ); Taylor
County: West Medford, Chequamegon Nat. Forest (MCZ).

UNDETERMINED LOCALITY: Mt. Toby (?). (presumably in the New England
 area, as it is an Emerton label) (MCZ).

Amaurobius agastus (Chamberlin) NEW COMBINATION

(Figs. 123 - 125, 315 - 318, 424)

Walmus agastus Chamberlin, 1947:11.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Orange County: Laguna Beach. July 25,
1931. Wilton Ivie, collector.

Walmus agastus:Roewer, 1954:1375. Vogel, 1967:19. Lehtinen, 1967:275.

DESCRIPTION

Male. Color. Carapace uniform orange. Legs slightly paler than carapace. Palpi, except for darker tibiae, same color as legs. Chelicerae same color as carapace. Endites of palpi and labium very pale orange. Sternum yellow, brighter than coxae. Opisthosoma gray streaked. Dorsum marked with two pairs of pale spots anteriorly, with incomplete chevrons posteriorly.

Structure. Total length 4.8 mm. Carapace 2.55 mm long, 1.7 mm wide. AME smallest eyes, lateral eyes largest. AME slightly more than diameter of one AME apart. ALE almost twice as large as AME.

Female. Color. Carapace almost uniform orange, very slightly darker in cephalic region than thoracic region. Legs paler than carapace. Palpi about same color as legs or slightly paler. Chelicerae darker orange than carapace. Endites of palpi and labium same color as carapace. Sternum about same color as coxae.

Structure. Total length about 6.5 to 8.5 mm. Carapace 3.0 to 3.7 mm long, 1.9 to 2.4 mm wide (ratio 1.54 to 1.58 times as long

as wide). AME smallest eyes, AME largest. AME slightly more than diameter of one AME apart. ALE about 1.8 times larger than AME.

REMARKS

The male of this species is described and figured here for the first time.

MATERIAL EXAMINED

Holotype ♀; one ♂; five ♀♀; four immatures.

DISTRIBUTION

Orange, Monterey, Riverside, and San Diego Counties, California (Fig. 424).

RECORDS

CALIFORNIA: Orange County: Laguna Beach (AMNH); Monterey County: Pacific Grove (AMNH); Riverside County: Keen Camp area, San Jacinto Mtns (AMNH); San Diego County: Alpine (AMNH); Mt. Palomar, 3 - 5000 ft. alt. (AMNH); 2 Mi. E. Pine Springs (AMNH); Undetermined locality: Aliso Canyon (probably in Orange or Los Angeles County).

Amaurobius dorotheae (Chamberlin) NEW COMBINATION

(Figs. 126 - 128, 319 - 320, 424)

Walmus dorotheae Chamberlin, 1947:13.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Tulare County: 2 Mi. N.E. Hammond on

Hwy 198, or about 3 Mi. N.E. Three Rivers. March
23, 1941. D. Mulaik, collector.

DIAGNOSIS

The bilobed median apophysis of the male of this species distinguishes it from all others of the genus Amaurobius in the Nearctic Region.

DESCRIPTION

Male. Color. Carapace uniform orange. Legs about same color as carapace. Palpi, except for slightly darker tibiae, same color as legs. Chelicerae darker orange than carapace. Endites of palpi and labium light brown. Sternum about same color as coxae. Opisthosoma streaked dark gray. Dorsum with pale spots anteriorly, chevrons posteriorly. Venter with four pale stripes between epigastric furrow and spinnerets.

Structure. Total length about six to seven mm. Carapace 2.9 to 3.4 mm long, 2.0 to 2.3 mm wide (ratios 1.45 to 1.48 times as long as wide). AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE slightly more than twice as large as AME.

Female. Color. (holotype slightly faded) As in male, except carapace darker orange in cephalic region than in thoracic region.

Structure. Total length about six to 9.5 mm. Carapace 2.7 to 3.9 mm long, 1.8 to 2.6 mm wide (ratios 1.5 to 1.67 times as long

wide). Eyes as in male.

FIELD NOTES

One male, collected as in immature, moulted to adult male on September 20. Females were collected in March and July.

REMARKS

The male is described and figured here for the first time. The holotype label reads: "Walmus dorotheae Chamberlin. Col.: 2 Mi. N.E. Hammond. Mar. 23, 1941. D. Mulaik. holotype." The town and state are Hammond, California, not Hammond, Colorado. This is confirmed by Dr. S.D. Mulaik (in litt., about August 7, 1969). The type locality is in doubt (see REMARKS under Pimus pitus).

MATERIAL EXAMINED

Holotype ♀; two ♂♂; seven ♀♀; one immature.

DISTRIBUTION

Tulare County, California (Fig. 424).

RECORDS

CALIFORNIA: Tulare County: 2 Mi. N.E. Hammond on Hwy 198, or about 3 Mi. N.E. Three Rivers (AMNH); Ash Mtn Entrance, Sequoia National Park, 3700 ft. alt. (AMNH).

Amaurobius mathetes (Chamberlin) NEW COMBINATION

(Figs. 129 - 132, 321 - 322, 424)

Walmus mathetes Chamberlin, 1947:15.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Alameda County: Berkeley. October
1919.

Walmus mathetes: Roewer, 1954:1375. Vogel, 1967:19. Lehtinen, 1967:275.

DESCRIPTION

Male. Color. Carapace uniform orange. Legs darkened distally. Legs basally about same color as carapace. Palpi, except for darker tibiae, paler than legs. Chelicerae slightly darker orange than carapace. Endites of palpi and labium about same color as coxae, sternum slightly darker. Opisthosoma pale or dark gray. Dorsum with small, pale spots anteriorly, chevrons posteriorly.

Structure. Total length about 4.5 to six mm. Carapace about 2.5 to 2.8 mm long, 1.7 to 1.9 mm wide (ratio 1.45 to 1.5 times as long as wide). AME smallest eyes, ALE largest. ALE about 2.5 times as large as AME.

Female. Color. Same as male, except cephalic region of carapace darker than thoracic region, and chelicerae distinctly darker orange than carapace in larger specimens. Smaller specimens as pale as males.

Structure. Total length about four to 6.5 mm. Carapace about 2.3 to 3.2 mm long, 1.6 to 2.1 mm wide (ratio 1.35 to

1.52 times as long as wide). AME smallest eyes, lateral eyes largest.
ALE about three times as large as AME.

MATERIAL EXAMINED

Holotype♂; 32 ♂♂; 73 ♀♀; 157 immatures.

DISTRIBUTION

Alameda and Contra Costa Counties, California (Fig. 424).

RECORDS

CALIFORNIA: Alameda County: Berkeley (AMNH) (CU); S. side Woolsey Canyon, Berkeley (AMNH); North Canyon at E. side of Caldecutt Tunnel (PRC); Castro Valley (AMNH); Niles, Canyon off Niles Canyon (AMNH); Mtn Blvd., Oakland (AMNH); Mtn Blvd. and Pk., Oakland (AMNH); Oakland (AMNH); Contra Costa County: Orinda Village (AMNH); 1 Mi. W. Orinda (AMNH); 2 Mi. W. Orinda (AMNH).

Amaurobius tulare Leech, new species

(Figs. 133 - 135, 323 - 324, 425)

Amaurobius tulare Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Tulare County: 2.5 Mi. E. California Hot Springs. September 15, 1959. V. Roth and W.J. Gertsch, collectors.

DESCRIPTION

Male. Color. Carapace uniform pale orange. Legs slightly paler than carapace. Legs slightly darkened distally. Palpi, except for darker tibiae, same color as legs. Chelicerae darker orange than carapace. Endites of palpi and labium slightly darker than coxae, sternum same color as coxae. Opisthosoma mottled green gray. Dorsum with two parenthesis-shaped spots anteriorly, chevrons posteriorly.

Structure. Total length about 5.5 to 6.5 mm. Carapace 2.8 to 3.0 mm long, 1.9 to 2.0 mm wide (ratios 1.47 to 1.5 times as long as wide). AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE slightly more than twice as large as AME.

Female. Color. Both females are teneral.

Structure. Total length about 5.5 to 7 mm. Carapace 2.8 to 3.6 mm long, 1.9 to 2.3 mm wide (ratios 1.47 to 1.56 times as long as wide). AME smallest eyes, ALE largest. AME about two diameters of one AME apart. ALE about three times as large as AME.

FIELD NOTES

All male and female specimens of this species were collected on September 15, 1959.

REMARKS

The name of this species is derived from the word tule, meaning cattail or bullrush or any similar reed. Tules grow in places called

tulars, hence tulare (Gudde, 1969:34b).

MATERIAL EXAMINED

Holotype ♂; two ♂♂; two ♀♀; one immature.

DISTRIBUTION

Tulare County, California (Fig. 425).

RECORDS

CALIFORNIA: Tulare County: 2.5 Mi. E. California Hot Springs, 3075 ft. alt. (AMNH); 10 Mi. W. Johnsondale (AMNH).

Amaurobius tamalpais Leech, new species

(Figs. 136 - 138, 325 - 326, 425)

Amaurobius tamalpais Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Marin County: West Slope Mount
Tamalpais. January 10, 1963. V. Roth and P.R.
Craig, collectors.

DESCRIPTION

Male. Color. Carapace light orange. Legs slightly paler than carapace. Legs darkened slightly distally. Palpi, except for darker tibiae, same color as legs. Chelicerae slightly darker orange than carapace. Endites of palpi and labium pale orange brown. Sternum lightly mottled, otherwise same color as coxae. Opisthosoma dark gray.

Dorsum unmarked anteriorly, indistinctly marked with chevrons posteriorly.

Structure. Total length 4.5 mm. Carapace 2.4 mm long, 1.5 mm wide. AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE about twice as large as AME.

Female. Color. Carapace orange, darkened slightly in cephalic region. Legs about same color as thoracic region of carapace. Legs darkened slightly distally. Palpi same color as legs. Chelicerae brown. Endites of palpi and labium pale brown. Sternum slightly darker than coxae. Opisthosoma pale gray, irregularly streaked with darker gray on some specimens. Dorsum unmarked anteriorly, unmarked or with indistinct chevrons posteriorly.

Structure. Total length about 4.5 to six mm. Carapace extremes 2.05 mm to 2.9 mm long, 1.35 to 1.9 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE slightly less than twice as large as AME.

FIELD NOTES

The male of this species was collected on January 10, 1963. Females have been collected in January and April.

REMARKS

The members of this species are closely related to those of Amaurobius vexans. The name for this species is derived from tamalpais, either an Indian name meaning bay mountains, or more likely, it was the

name of a village of the Tamal Indians (Gudde, 1969:330).

MATERIAL EXAMINED

Holotype ♂; 8 ♀♀.

DISTRIBUTION

Marin and San Francisco Counties, California (Fig. 425).

RECORDS

CALIFORNIA: Marin County: West Slope Mt. Tamalpais (AMNH); San Francisco County: San Francisco (AMNH).

Amaurobius vexans Leech, new species

(Figs. 139 - 144, 327 - 328, 426)

Amaurobius vexans Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Marin County: San Geronimo. September 19, 1963. Jean and Wilton Ivie, collectors.

DESCRIPTION

Male. Color. Carapace uniform orange. Femora of legs same color as carapace. Legs darkened distally. Palpi same color as legs. Chelicerae slightly darker orange than carapace. Endites of palpi and labium same color as carapace. Sternum with faint mottling, otherwise same color as coxae. Opisthosoma gray. Dorsum unmarked, except for pale area over heart, anteriorly. Spots or chevrons posteriorly.

Structure. Total length about five to 5.5 mm. Carapace extremes 2.4 to 2.8 mm long, 1.6 to 1.9 mm wide (ratios 1.47 to 1.5 times as long as wide). AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE slightly less than twice as large as AME.

Female. Color. Carapace orange, slightly darkened in cephalic region. Femora of legs about same color as thoracic region of carapace. Legs darkened distally. Palpi same color as legs. Chelicerae brown orange. Endites of palpi and labium pale brown. Sternum with faint mottling, otherwise slightly darker than coxae. Opisthosoma gray. Dorsum of most specimens without markings anteriorly, with chevrons or spots posteriorly.

Structure. Total length about four to seven mm. Carapace extremes 2.5 to 3.2 mm long, 1.7 to 1.9 mm wide (ratios 1.47 to 1.68 times as long as wide). AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE slightly less than twice as large as AME.

FIELD NOTES

Males of this species were collected during September and October, females in March and September. Many of the adult specimens collected in mid September are teneral.

REMARKS

The name for this species is derived from the Latin vexans, meaning annoying. This is in reference to the fact that the specimens

of this species were placed with specimens of another species by accident. The error was not discovered for months.

MATERIAL EXAMINED

Holotype ♂; 64 ♂♂; 52 ♀♀; 43 immatures.

DISTRIBUTION

Marin County, California (Fig. 426).

RECORDS

CALIFORNIA: Marin County: Corte Madera (AMNH); 7 Mi. E. Point Reyes Station (AMNH); San Geronimo (AMNH).

Amaurobius latescens (Chamberlin) NEW COMBINATION

(Figs. 142 - 144, 329 - 334, 427)

Auximus latescens Chamberlin, 1919b:3.

HOLOTYPE: Female, MCZ Type No. 372.

TYPE LOCALITY: CALIFORNIA: Los Angeles County: Claremont. 1909.

R.V. Chamberlin, collector.

Auximus latescens: Bonnet, 1955:824.

Walmus latescens: Chamberlin, 1947:14. Roewer, 1954:1375. Lehtinen, 1967:275.

Walmus hermosus Chamberlin, 1947:14.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Los Angeles County: Hermosa Beach.

March 18, 1941. Wilton Ivie, collector. NEW

SYNONYMY.

Walmus hermosus:Roewer, 1954:1375. Lehtinen, 1967:275. Vogel, 1967:19.

NOTES ON SYNONYMY

The general morphology of the epigynum of Amaurobius latescens varies from specimen to specimen, and the holotype of Walmus hermosus fits well within the variation observed in females of Amaurobius latescens.

DESCRIPTION

Male. Color. Carapace pale or dark orange. Legs slightly paler than carapace. Palpi about same color as legs. Chelicerae about same color as carapace or slightly darker. Endites of palpi and labium orange. Sternum same color as coxae. Opisthosoma pale or dark gray. Dorsum with two pale, parenthesis-shaped spots anteriorly, chevrons posteriorly. Venter with two or four pale stripes between epigastric furrow and spinnerets.

Structure. Total length about 5.5 to eight mm. Carapace extremes 2.7 to 4.0 mm long, 1.7 to 2.6 mm wide (ratios 1.59 to 1.53 times as long as wide). AME smallest eyes, ALE largest. AME about diameter or more of one AME apart. ALE about twice as large as AME.

Female. Color. Color of female as in male, except sternum of some specimens much darker than coxae, and dorsal anterior markings lacking on opisthosoma.

Structure. Total length about seven to 12 mm.

Carapace extremes 3.0 to 5.6 mm long, 2.0 to 3.6 mm wide (ratios 1.5 to 1.55 times as long as wide). Eyes as in male.

FIELD NOTES

Specimens of this species were collected in oak leaf litter and in humus under rocks. Males were collected from October to March, and July, and females throughout the year.

REMARKS

It is odd that Lehtinen (1967:275) stated that the holotype preservation is unknown, as it is in the Museum of Comparative Zoology at Harvard University.

MATERIAL EXAMINED

Holotype ♀; Holotype ♀ Walmus hermosus; 18 ♂♂; 47 ♀♀; 18 immatures.

DISTRIBUTION

Coastal California, from San Diego County north to Marin County (Fig. 427).

RECORDS

CALIFORNIA: Los Angeles County: Altadena (HEF); Chantry Flats (MET) (MCZ); Claremont (MCZ); San Dimas Canyon, nr Claremont (AMNH); Eaton Canyon (UU); Eaton Canyon Park (MET); Glendale (AMNH); Hermosa Beach (AMNH); Los Angeles (AMNH); Big Rock Camp, San Gabriel Mtns (AMNH); Big

Tujanga Canyon, San Gabriel Mtns (AMNH); Fish Canyon, San Gabriel Mtns (AMNH); Tanbark Flats, San Gabriel Mtns (AMNH); Santa Monica Mtns (AMNH); Agoura, Santa Monica Mtns (AMNH); Sepulveda Canyon, Santa Monica Mtns (MET); Topanga Canyon, Santa Monica Mtns (AMNH); Angeles National Forest, Vic Henninger Flats (MET); Whittier on Turnbull Canyon Road (AMNH); Marin County: Bolinas (AMNH); Orange County: Irvine (UU); Idyllwild, San Jacinto Mtns (AMNH); 3 Mi. N. Idyllwild, nr Riverside (AMNH); San Diego County: Del Mar (AMNH); Santa Barbara County: Santa Barbara (AMNH); Fry's Harbor, Santa Cruz Island (AMNH).

Amaurobius heathi (Chamberlin) NEW COMBINATION

(Figs. 145 - 147, 335 - 336, 426)

Walmus heathi Chamberlin, 1947:13.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Monterey County: Pacific Grove.

August 15, 1931. Wilton Ivie, collector.

Walmus heathi: Roewer, 1954:1375. Vogel, 1967:19. Lehtinen, 1967:275.

DIAGNOSIS

The large lateral lobes of the female and the long, thin median apophysis distinguish the members of this species from all others of the genus Amaurobius found in the Nearctic Region.

DESCRIPTION

Male. Color. Carapace uniform pale orange. Legs slightly paler than carapace, distal segments lightly annulated. Palpi same color

as legs. Chelicerae slightly darker orange than carapace. Endites of palpi and labium pale orange. Sternum about same color as coxae. Opisthosoma streaked with green gray. Dorsum with pale spots anteriorly, chevrons posteriorly. Venter with two pale stripes posterior to book lung openings.

Structure. Total length 5.3 mm. Carapace 2.8 mm long, 1.9 mm wide (ratio 1.47 times as long as wide). AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart.

Female. Color. Color as in male, except carapace slightly darker in cephalic region than in thoracic region.

Structure. Total length about five to nine mm. Carapace 2.6 to 3.4 mm long, 1.7 to 2.1 mm wide (ratios 1.53 to 1.62 times as long as wide). Other features as in male.

MATERIAL EXAMINED

Holotype ♂; two ♀♀; five immatures.

DISTRIBUTION AND RECORDS

Known from the type locality only (Fig. 426).

Amaurobius barbaricus Leech, NEW NAME

(Figs. 148 - 150, 337 - 338, 426)

Walmus barbarus Chamberlin, 1947:11.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Santa Barbara County: Santa Barbara.

March, 1913. R.V. Chamberlin coll.

Walmus barbarus: Roewer, 1954:1375. Vogel, 1967:19. Lehtinen, 1967:275.

NOTES ON SYNONYMY

The species named Walmus barbarus is a member of the genus Amaurobius. However, the combination Amaurobius barbarus is preoccupied by Amaurobius barbarus Simon (1911:275). Therefore, a new name is necessary, and I propose the combination Amaurobius barbaricus Leech, NEW NAME.

DESCRIPTION

Male. Color. Carapace uniform dull orange. Legs paler than carapace. Palpi, except for darker tibiae, same color as legs. Chelicerae slightly darker orange than carapace. Endites of palpi, labium, and sternum all about same color as coxae. Opisthosoma gray streaked. Dorsum with large, central pale spot anteriorly, chevrons posteriorly. Venter with two pale stripes posterior to book lung openings.

Structure. Total length 4.8 mm. Carapace 2.4 mm long, 1.6 mm wide (ratio 1.5 times as long as wide). AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE almost twice as

large as AME.

Female. Color. Carapace orange, slightly darker orange in cephalic region than in thoracic region. Legs darkened distally. Legs about same color as carapace. Palpi colored as legs. Chelicerae dark red brown. Endites of palpi and labium pale brown. Sternum slightly darker than coxae. Opisthosoma gray. Dorsum unmarked anteriorly, unmarked or with pale chevrons posteriorly. Venter unmarked.

Structure. Total length about 6.5 to eight mm. Carapace 3.0 to 4.0 mm long, 1.9 to 2.3 mm wide (ratio 1.58 to 1.74 times as long as wide). AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE about twice as large as AME.

REMARKS

The new name for this species is derived from the Latin word barbaricus, meaning foreign.

MATERIAL EXAMINED

Holotype♂; seven ♀♀.

Amaurobius corruptus Leech, new species

(Figs. 339 - 340, 428)

Amaurobius corruptus Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Monterey County: Hastings Natural History Reserve. February 22, 1941. Linsdale

Collection.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace orange red, darkened anteriorly. Femora of legs about same color as thoracic region of carapace. Legs darkened distally. Palpi colored as legs. Chelicerae chestnut red. Endites of palpi and labium brown. Sternum light brown, darker than coxae. Opisthosoma gray brown, streaked. Dorsum with two pairs of pale spots anteriorly, with chevrons posteriorly.

Structure. (Holotype badly damaged.) Total length 8.6 mm. Carapace 4.0 mm long, 2.7 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE slightly less than twice as large as AME.

REMARKS

The name for this species is derived from the Latin word corruptus, meaning damaged. This is in reference to the extremely poor condition of the holotype.

MATERIAL EXAMINED

Holotype ♀.

Amaurobius diablo Leech, new species

(Figs. 341 - 344, 428)

Amaurobius diablo Leech, new species.

HOLOTYPE: Female, CAS.

TYPE LOCALITY: CALIFORNIA: Contra Costa County: S. boundary Mount
Diablo State Park (canyon off road). 1200 ft. alt.
January 13, 1964. V.D. Roth and P.R. Craig,
collectors.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace yellow orange, darkened anteriorly.
Femora of legs about same color as thoracic region of carapace. Legs
darkened distally. Palpi colored as legs. Chelicerae light chestnut
brown. Endites of palpi and labium light brown, almost orange. Sternum
same color as coxae or slightly darker. Opisthosoma gray with large,
irregular pale blotches scattered over surface. Dorsum with indistinct
marks anteriorly, with chevrons posteriorly or unmarked.

Structure. Total length about 4.5 to six mm. Carapace
extremes 2.0 mm to 3.5 mm long, 1.3 to 2.2 mm wide. AME smallest eyes,
ALE largest. AME slightly more than diameter of one AME apart. ALE
about twice as large as AME.

FIELD NOTES

Adult females of this species have been collected from January to
May.

REMARKS

The name for this species is derived from the Spanish word diablo, meaning devil. The epigynum of females of this species is variable.

MATERIAL EXAMINED

Holotype ♀; 19 ♀♀; 30 immatures.

DISTRIBUTION

Alameda, Contra Costa, Solano, and Sonoma Counties, California (Fig. 428).

RECORDS

CALIFORNIA: Alameda County: 21 Mi. S.E. Livermore on Mines Road (AMNH); Contra Costa County: Clayton (AMNH); Mt. Diablo (AMNH); S. boundary Mt. Diablo State Park, 1200 ft. alt. (CAS) (PRC); Solano County: 1 Mi. W. Cordelia (AMNH); Sonoma County: Glen Ellen (AMNH); 3 Mi. W. Glen Ellen (AMNH); Mt. St. Helena (AMNH); 4 Mi. W. Oakville (AMNH); 7 Mi. W. Oakville (AMNH).

Amaurobius distortus Leech, new species

(Figs. 151 - 154, 428)

Amaurobius distortus Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Tulare County: Quaking Aspen Camp.

September 9, 1959. W.J. Gertsch and V. Roth,
collectors.

DIAGNOSIS

The peculiar, large, bifurcate dorsal process on the palpal tibiae of male members of this species distinguish them from all other amaurobiids in the Nearctic Region.

DESCRIPTION

Male. Color. Carapace uniform pale yellow orange. Femora of legs same color as carapace. Legs darkened distally. Legs III and IV with annulations. Palpi about same color as femora of legs. Chelicerae slightly more orange than carapace. Endites of palpi and labium slightly darker than coxae. Sternum same color as coxae. Opisthosoma medium pale gray brown above, much paler below. Dorsum with two pairs of white spots anteriorly, indistinct chevrons posteriorly.

Structure. Total length 4.5 mm. Carapace 2.1 mm long, 1.45 mm wide. AME smallest eyes, lateral eyes largest. AME about diameter of one AME apart. ALE slightly more than twice as large as AME.

Female. Unknown.

REMARKS

The name for this species is derived from the Latin word distortus, meaning distorted. This is in reference to the distorted shape of the bifurcate dorsal process compared with the other Nearctic

species of Amaurobius.

MATERIAL EXAMINED

Holotype ♂.

Amaurobius galeritus Leech, new species

(Figs. 345 - 346, 429)

Amaurobius galeritus Leech, new species.

HOLOTYPE: Female, MCZ.

TYPE LOCALITY: CALIFORNIA: Tulare County: Quaking Aspen Camp.
7000 ft. alt. July 5, 1964. Larry Pinter,
collector.

DIAGNOSIS

The large, posteriorly protruding lateral lobes of the epigynum of females of this species distinguish it from all other Amaurobius species in the Nearctic Region.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace orange, darkened anteriorly. Femora of legs about same color as carapace. Legs darkened distally. Palpi colored as legs. Chelicerae dark red brown. Endites of palpi and labium brown, almost orange. Sternum slightly browner than coxae. Opisthosoma almost white, with very pale, indistinct markings on dorsum.

Structure. Total length 5.8 mm. Carapace 2.4 mm long, 1.7 mm wide. AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE about 1.5 times larger than AME.

REMARKS

The name for this species is derived from the Latin word galeritus, meaning hooded. This is in reference to the hood-like appearance the lateral lobes have around the posterior lobe. Possibly, this is the female of the species named Amaurobius distortus.

MATERIAL EXAMINED

Holotype ♀.

Amaurobius hagiellus (Chamberlin) NEW COMBINATION

(Figs. 347 - 348, 429)

Walmus hagiellus Chamberlin, 1947:13.

HOLOTYPE: Female, AMNH (?).

TYPE LOCALITY: CALIFORNIA: (exact locality not given).

Walmus hagiellus:Roewer, 1954:1375. Lehtinen, 1967:275. Vogel, 1967:19.

DESCRIPTION

Male. Unknown.

Female. Color. (specimen badly damaged) Carapace orange, darkened in cephalic region. Legs about same color as thoracic region of carapace. Legs darkened distally. Chelicerae brown orange. Endites

of palpi, labium, and sternum all orange, darker than coxae. Opisthosoma cream colored, unmarked.

Structure. Total length about eight mm. Carapace 3.5 mm long, 2.2 mm wide (ratio 1.59 times as long as wide). AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE almost twice as large as AME.

FIELD NOTES

The only female specimen available was collected on July 2, 1958.

REMARKS

Lehtinen (1967:275) reported having seen the holotype of Walmus hagiellus in the American Museum of Natural History in New York. However, it is not there now, and its whereabouts is uncertain. Thus, I can presume only that the specimen I have before me is a specimen of the species Amaurobius hagiellus (Chamberlin).

MATERIAL EXAMINED

One ♀.

DISTRIBUTION

Ventura County, California (holotype, according to Chamberlin, (1947:13) is labelled only "California") (Fig. 429).

RECORDS

CALIFORNIA: Ventura County: Wheeler Springs (AMNH).

Amaurobius intermedius Leech, new species

(Figs. 155 - 157, 349 - 350, 429)

Amaurobius intermedius Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Mendocino County: 5 Mi. E. Anchor Bay.
September 12, 1961. W.J. Gertsch and W. Ivie,
collectors.

DIAGNOSIS

The two large, anteriorly-directed prongs on the dorsal process of the male palpal tibia distinguish the members of this species from all other Amaurobius species in the Nearctic Region.

DESCRIPTION

Male. Color. Carapace uniform pale orange. Femora of legs slightly paler than carapace. Legs darkened distally. Palpi, except for darker tibiae, same color as legs. Chelicerae slightly darker orange than carapace. Endites of palpi and labium pale orange. Sternum, except for pale mottling, same color as coxae. Opisthosoma dark gray. Dorsum with two pairs of pale spots anteriorly, with indistinct and/or incomplete chevrons posteriorly. Venter with four pale stripes between epigastric furrow and spinnerets.

Structure. Total length 4.85 mm. Carapace 2.4 mm long, 1.7 mm wide. AME smallest eyes, ALE largest. PME slightly smaller than PLE. AME about 0.66 diameters of one AME apart. ALE slightly less than twice as large as AME.

Female. Color. (Specimen either teneral or faded.)

Structure. Total length 4.4 mm long. Carapace 2.2 mm long, 1.6 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE about twice as large as AME.

REMARKS

The name of this species is derived from the Latin word intermedius, meaning intermediate. This is in reference to the size of the prongs on the dorsal process of the palpal tibia, which are about intermediate in size between those usually found on Amaurobius palpal tibia and the extreme found on Amaurobius distortus.

MATERIAL EXAMINED

Holotype ♂; one ♀.

DISTRIBUTION AND RECORDS

Known only from type locality (Fig. 429).

Amaurobius mephisto (Chamberlin) NEW COMBINATION

(Figs. 351 - 352, 429)

Walmus mephisto Chamberlin, 1947:15.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Contra Costa County: Mt. Diablo.

Walmus mephisto: Roewer, 1954:1376. Lehtinen, 1967:275. Vogel, 1967:19.

DESCRIPTION

Male. Unknown.

Female. Color. (Holotype specimen is damaged and slightly faded.) Carapace almost uniform orange, very slightly darker orange in cephalic than in thoracic region. Legs slightly paler than carapace. Legs darkened slightly distally. Palpi same color as legs. Chelicerae dark orange. Endites of palpi and labium about same color as carapace. Sternum about same color as coxae. Opisthosoma streaked with pale brown gray. Dorsum with indistinct spots anteriorly, indistinct chevrons posteriorly. Venter with indistinct marks.

Structure. Total length 6.0 mm. Carapace 3.0 mm long, 1.7 mm wide (ratio 1.76 times as long as wide). AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE almost twice as large as AME.

MATERIAL EXAMINED

Holotype ♀.

Amaurobius minutus Leech, new species

(Figs. 353 - 354, 430)

Amaurobius minutus Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Mariposa County: 1 Mi. S. Fish Camp.

About 4900 ft. alt. September 23, 1961. W. Ivie

and W.J. Gertsch, collectors.

DIAGNOSIS

The very small size of members of this species, about 3 mm long, distinguish them from all others in the genus Amaurobius in the Nearctic Region.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace pale yellow orange, darkened anteriorly. Legs about same color as thoracic region of carapace. Palpi about same color as legs. Chelicerae pale orange, about same color as cephalic region of carapace or very slightly darker. Endites of palpi and labium about same color as cephalic region of carapace. Sternum yellow, brighter than coxae. Opisthosoma with gray and white patches. Dorsum with two pairs of large pale spots anteriorly, chevrons posteriorly.

Structure. Total length 2.9 mm. Carapace 1.5 mm long, 1.0 mm wide. AME smallest eyes, ALE largest. ALE about 2.5 times as large as AME.

REMARKS

The name of this species is derived from the Latin word minutus, meaning minute. This is in reference to the small size of members of this species relative to others in the genus Amaurobius.

MATERIAL EXAMINED

Holotype ♀.

Amaurobius palomar Leech, new species

(Figs. 355 - 356, 430)

Amaurobius palomar Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: San Diego County: Mount Palomar, 3 -
5000 ft. alt. June 30, 1956. W.J. Gertsch and
Vince Roth Collectors.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace orange, darkened anteriorly. Femora of legs about same color as thoracic region of carapace. Legs darkened distally. Palpi colored as legs. Chelicerae light chestnut brown. Endites of palpi and labium light brown, darker than sternum. Sternum about same color as coxae or slightly darker. Opisthosoma gray. Dorsum unmarked anteriorly, with chevrons posteriorly.

Structure. Total length about seven to eight mm. Carapace 3.2 to 3.4 mm long, 1.9 to 2.2 mm wide. AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE about twice as large as AME.

REMARKS

The name for this species come from the Spanish word paloma, meaning pigeon. The locatine -r ending, for "place of the pigeons", was often used for place names by the Spanish in California. One female of this species contained a Mermithid (Nematoda) worm inside its opisthosoma. The external genitalia appear not to be deformed.

MATERIAL EXAMINED

Holotype ♀; three ♀♀.

DISTRIBUTION

San Diego County, California (Fig. 430).

RECORDS

CALIFORNIA: San Diego County: Cleveland Nat. Forest nr. Henshaw Reserve (AMNH); Mt. Palomar, 3 - 5000 ft. alt. (AMNH).

Amaurobius pilosus Leech, new species

(Figs. 357 - 358, 430)

Amaurobius pilosus Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: San Mateo County: Thornton Beach Park, Daly City. September 16, 1963. Jean and Wilton Ivie, collectors.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace yellow orange, darkened anteriorly. Femora of legs about same color as thoracic region of carapace. Legs darkened slightly distally. Palpi colored as legs. Chelicerae light chestnut brown. Endites of palpi and labium pale brown, almost orange. Sternum about same color as coxae or slightly darker. Opisthosoma gray, streaked laterally. Dorsum with indistinct marks anteriorly, with indistinct chevrons posteriorly.

Structure. Total length about five to six mm. Carapace 2.5 to 2.6 mm long, 1.6 to 1.65 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. ALE slightly less than twice as large as AME.

FIELD NOTES

Females of this species were collected in September and December.

REMARKS

The name for this species is derived from the Latin word pilosus, meaning hairy. This is in reference to the hairiness of the holotype of this species. The paratypes are badly rubbed.

MATERIAL EXAMINED

Holotype ♀; two ♀♀.

DISTRIBUTION

San Francisco and San Mateo Counties, California (Fig. 430).

RECORDS

CALIFORNIA: San Francisco County: San Francisco (DJB); San Mateo County: Thornton Beach Park, Daly City (AMNH).

Amaurobius transversus Leech, new species

(Figs. 359 - 360, 430)

Amaurobius transversus Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Monterey County: Redwood Canyon, 4 Mi. S. Gorda. April 2, 1960. W.J. Gertsch, W. Ivie, and R. Schrammel, collectors.

DIAGNOSIS

The large notch in the midsection of the posterior lobe of the epigynum of female members of this species distinguish them from all others in the genus Amaurobius in the Nearctic Region.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace orange, darkened anteriorly. Femora of legs about same color as thoracic region of carapace. Anterior two pairs of legs darkened distally. Palpi colored as anterior legs.

Chelicerae light brown. Endites of palpi and labium brown orange.

Sternum lightly mottled, otherwise about same color as coxae. Opisthosoma dark gray. Dorsum unmarked except for indistinct and incomplete chevrons posteriorly.

Structure. Total length 5.4 mm. Carapace 2.8 mm long, 1.8 mm wide. AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE slightly more than twice as large as AME.

REMARKS

The name for this species is derived from the Latin word transversus, meaning transverse. This is in reference to the bar-like appearance of the posterior lobe of the epigynum.

MATERIAL EXAMINED

Holotype ♀.

Amaurobius triangularis Leech, new species

(Figs. 361 - 362, 431)

Amaurobius triangularis Leech, new species.

HOLOTYPE: Female, CAS.

TYPE LOCALITY: CALIFORNIA: Monterey County: Pfeiffer Big Sur State Park. 300 ft. alt. May 2, 1964. P.R. Craig, collector.

DIAGNOSIS

The triangular midsection of the posterior lobe and the large, posteriorly protruding lateral lobes on the epigynum of female members of this species distinguish them from all others in the genus Amaurobius in the Nearctic Region.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace orange, very slightly darkened anteriorly. Femora of legs about same color as carapace. Legs darkened distally. Palpi colored as legs. Chelicerae light chestnut brown. Endites of palpi, labium and sternum light brown, darker than coxae. Opisthosoma gray. Dorsum unmarked or with indistinct marks anteriorly, with chevrons posteriorly.

Structure. Total length six to 8.5 mm. Carapace 2.7 to 3.1 mm long, 1.7 to 1.9 mm wide. AME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. ALE about twice as large as AME.

REMARKS

The name for this species is derived from the Latin word triangularis, meaning triangular. This is in reference to the triangular shape of the projecting midpart of the posterior lobe of the epigynum. Paratypes are in the collection of P.R. Craig, Berkeley, California.

MATERIAL EXAMINED

Holotype ♀; five ♀♀; 15 immatures.

DISTRIBUTION

Known from the type locality only (Fig. 431).

Amaurobius prosopidus Leech, new species

(Figs. 158 - 160, 363 - 364, 431)

Amaurobius prosopidus Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Marin County: S.P. Taylor State Park.

November 8, 1953. V. Roth and R. Schuster,
collectors.

DESCRIPTION

Male. Color. Carapace uniform bright orange. Femora of legs about same color as carapace. Legs darkened distally. Palpi about same color as legs. Chelicerae brown orange, about same color as legs distally. Endites of palpi and labium orange. Sternum with pale mottling, otherwise slightly darker than coxae. Opisthosoma with dark green gray streaks. Dorsum unmarked anteriorly, with incomplete chevrons posteriorly. Venter with two broad pale stripes posterior to book lung openings, and with two patchy stripes between epigastric furrow and spinnerets.

Structure. Total length 5.3 mm. Carapace 2.85 mm long, 1.85 mm wide. AME smallest eyes, ALE largest. AME slightly less than diameter of one AME apart. ALE slightly less than twice as large as AME.

Female. Color. Carapace orange, darkened slightly anteriorly. Femora of legs about same color as thoracic region of carapace. Legs darkened distally. Palpi colored as legs. Chelicerae light brown. Endites of palpi and labium pale brown, almost orange. Sternum with pale mottling, otherwise slightly darker than coxae. Opisthosoma as in male.

Structure. Total length about 4.5 to six mm. Carapace extremes 2.3 mm to 3.0 mm long, 1.5 to 2.0 mm wide. Eyes as in male.

FIELD NOTES

The only male known for this species was collected in early November. Females were collected throughout the year.

REMARKS

The name for this species is derived from the Greek word prosopon, meaning face. This is in reference to the hooded, face-like appearance of the epigynum from ventral view.

MATERIAL EXAMINED

Holotype ♂; 16 ♀♀; 13 immatures.

DISTRIBUTION

Marin County, California (Fig. 431).

RECORDS

CALIFORNIA: Marin County: 2 Mi. N. Bolinas (AMNH); 1 Mi. W. Inverness (AMNH); Mill Valley (AMNH); Outside Muir Woods National Monument in California Laurel (AMNH); S. end S.P. Taylor State Park (AMNH); S.P. Taylor State Park (AMNH).

Genus Zanomys Chamberlin

Zanomys Chamberlin, 1948:17.

TYPE SPECIES: Zanomys kaiba Chamberlin, 1948:18, by original designation.

REMARKS

Members of the genus Zanomys bear a strong resemblance to members of the genus Amaurobius as regards to details of the genitalia, and it is with some hesitation that I retain the genus name. However, all members of the genus Zanomys are very small, much smaller than any members of the genus Amaurobius known to me (see also REMARKS under Amaurobius).

DIAGNOSIS OF THE GENUS Zanomys

Minute, total length generally less than three mm. Thoracic groove absent externally on most specimens, but longitudinal when present. Labium distinctly wider than long, widest at base. Cribellum divided (not obvious in some pale or teneral specimens). Chelicerae not geniculate. Chelicerae with two or three small teeth on retromargin of fang furrow, and small keel, or two or three teeth on promargin. Cheliceral scopula and boss present. Legs lacking any definite or distinct spines or bristles. Trichobothria increased in length distally on tarsi and metatarsi, with most distal trichobothrium of each leg article often half as long or more than half as long as respective article.

Key to the Species of Zanomys

- 1. Male 2
- Female 6
- 2 (1). Palpal tibia with distinct, pointed process projected dorsally
or ventrally 3
- Palpal tibia with indistinct process, or with process pointed
distally along article of limb 5
- 3 (2). Palpal tibial process projected laterally (Fig. 161)
..... kaiba Chamberlin, p. 227
- Palpal tibial process projected dorsally 4
- 4 (3). Palpal tibial process long, thin, tapered to fine point
(Figs. 165) sagittaria, new species, p. 230
- Palpal tibial process short, thick, with blunt point (Fig.
167) aquilonia, new species, p. 231
- 5 (2). Palpal tibial process simple, finger-like (Figs. 168, 169)
..... californica (Banks), p. 233
- Palpal tibial process complex, with small, pointed
subprocesses (Figs. 171, 172) .. hesperia, new species, p. 235
- 6 (1). Spermathecae round or globular (Figs. 365, 371) 7
- Spermathecae elyptical, divergent anteriorly, with pale and
light bands alternated (Figs. 374)..ultima, new species, p. 239
- 7 (6). Epigynal plate, except for median lobe, plain (Figs. 367,
369) 8
- Epigynal plate with small cup-like protuberance on surface
between spermathecae opened posteriorly (Figs. 365, 366) .
..... kaiba Chamberlin, p. 227

- 8 (7). Spermathecae less than diameter of one spermatheca apart . 9
 - Spermathecae almost two diameters of one spermatheca apart
 sagittaria, new species, p. 230
- 9 (8). Spermathecae subrotund, with small dark line or slit
 anteromedially (Fig. 369) californica (Banks), p. 233
 - Spermathecae round, with no small dark lines or slits across
 spermathecae 10
- 10 (9). Median lobe distinct; copulation tubes traversed posteriorly
 to anteriorly (Figs. 371, 372) 11
 - Median lobe indistinct; copulation tubes traversed laterally
 across spermathecae aquilonia, new species, p. 231
- 11 (10). Median lobe of epigynum about as long as wide (Fig. 371) .
 ochra, new species, p. 236
 - Median lobe of epigynum wider than long (Fig. 372)
 feminina, new species, p. 238

Zanomys kaiba Chamberlin

(Figs. 161 - 163, 365 - 366, 432)

Zanomys kaiba Chamberlin, 1948:18.

HOLOTYPE: Male, location unknown.

TYPE LOCALITY: UTAH: "Dry Canyon".

Zanomys kaiba: Roewer, 1954:1376. Chamberlin and Gertsch, 1958:8.

Lehtinen, 1967:275. Vogel, 1967:20.

DESCRIPTION

Male. Color. Carapace uniform yellow. Femora of legs paler

than carapace. Legs darkened distally. Palpi, except for darker processes, same color as legs. Chelicerae about same color as carapace. Endites of palpi, labium, and sternum yellow, about same color as coxae. Opisthosoma patchy cream white and gray. Dorsum darker than venter. Dorsum with two pairs of pale spots anteriorly, chevrons posteriorly.

Structure. Total length about 1.6 to 1.7 mm. Carapace extremes 0.7 to 0.75 mm long, 0.55 to .057 mm wide. AME smallest eyes, ALE largest. AME elliptical in shape, touching, or almost touching, one another. AME about radius of one AME from ALE. PME almost diameter of one PME apart.

Female. Color. Female colored as male. Some females with dusky patch at posterior central part of cephalic region of carapace.

Structure. Total length about 1.55 to 1.95 mm. Carapace extremes 0.75 to 0.78 mm long, 0.55 to 0.58 mm wide. Eyes as in male.

FIELD NOTES

Males of this species were collected in September and October. Females were collected from May to November. Members of this species were collected in pine and spruce duff, and in the nests of Eutamias amoenus affinus.

REMARKS

There are numerous "Dry Canyons" in several counties in Utah, hence the type locality remains in doubt. There is a "Dry Canyon" in

Salt Lake City, and this is the probable type locality. The holotype is presumed lost. Details of the epigynum are extremely difficult to see, even on cleared parts.

MATERIAL EXAMINED

6 ♂♂; 49 ♀♀; 22 immatures.

DISTRIBUTION

New Mexico north and east to Idaho and South Dakota, west to Washington and Oregon (Fig. 432).

RECORDS

COLORADO: Larimer County: Rist Canyon, nr Fort Collins, 6000 ft. alt. (AMNH).

IDAHO: Adams County: Summit 7 Mi. N.E. Council, 44°49'N, 116°24'W (AMNH); Boise County: North Ferncroft, Payette River, 44°11'N, 116°07'W (AMNH); Washington County: Lost Lake reservoir, 4 Mi. N.W. Pine Ridge (AMNH).

NEW MEXICO: San Miguel County: nr pumice mines N.E. Grants (AMNH); 14 Mi. N.E. Grants (AMNH).

OREGON: Deschutes County: Lava Caves State Park (AMNH); Grant County: 6 Mi. S. Dale (AMNH); Jefferson County: big meadows N. of Santiam Pass (AMNH); Union County: Imbler (AMNH).

SOUTH DAKOTA: Custer County: 7 Mi. E. Custer, 5300 ft. alt. (AMNH).

UTAH: "Dry Canyon" (UU?); Salt Lake County: Hughes Canyon, nr Holladay, 40°35'N, 111°46'W (UU).

WASHINGTON: Spokane County: 5 Mi. S. Spokane (AMNH); Yakima County:

17 Mi. N. Naches (AMNH); Tieton River at 10 Mi. E. Rimrock (AMNH).

Zanomys sagittaria Leech, new species

(Figs. 164 - 165, 367, 432)

Zanomys sagittaria Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: San Bernardino County: Arrowhead Lake.

May 6, 1936. Bishop Collection.

DESCRIPTION

Male. Color. (All specimens much faded, but coloring looks to have been much like Z. kaiba.)

Structure. Total length about 1.95 to 2.0 mm (only one specimen complete). Carapace extremes 0.75 to 0.93 mm long, 0.68 to 0.75 mm wide. AME smallest eyes, ALE largest. AME round, very small, about one-third the size of ALE. AME about diameter or slightly less of one AME apart. PME about diameter of one PME apart.

Female. Color. (See male above.)

Structure. Total length about 1.3 to 1.45 mm. Carapace extremes 0.8 to 0.93 mm long, 0.6 to 0.7 mm wide. AME smallest eyes, ALE largest. AME about radius of one AME apart. ALE about twice as large as AME. PME about diameter of one PME apart.

REMARKS

The name for this species is derived from the Latin word sagitta, meaning arrow. The word sagittaria means arrowhead, and this is part of the name of the type locality. None of the specimens of this species before me are complete - most are lacking all legs and the opisthosoma is separated from the prosoma.

MATERIAL EXAMINED

Holotype ♂; 3 ♂♂; 24 ♀♀; 3 immatures.

DISTRIBUTION AND RECORDS

See type locality above (Fig. 432).

Zanomys aquilonia Leech, new species

(Figs. 166 - 167, 368, 433)

Zanomys aquilonia Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: OREGON: Washington County: Forest Grove.

February, 1941. J.C. Chamberlin, collector.

DESCRIPTION

Male. Color. Carapace uniform golden yellow with dusky streaks radiating from central dusky area. Legs yellow, paler than carapace. Palpi about same color as legs. Chelicerae about same color as carapace. Endites of palpi same color as carapace. Labium and sternum

dusky yellow. Opisthosoma colored as in Z. californica.

Structure. Total length about 1.6 mm (male broken, opisthosoma and 7 legs not attached to prosoma). Carapace 0.7 mm long, 0.65 mm wide. AME smallest eyes, ALE largest. AME elliptical. AME slightly less than diameter of one AME apart. ALE about 2.5 times as large as AME. PME slightly less than diameter of one AME apart.

Female. Color. Female colored as male.

Structure. Total length about 1.6 to 2.0 mm. Carapace extremes 0.7 to 0.8 mm long, 0.6 to 0.65 mm wide. Eyes approximately as in male.

FIELD NOTES

Females of this species were collected in February, June, and July. Specimens were found in spruce duff.

REMARKS

The name for this species is derived from the Latin word aquilonia, meaning northern. This is in reference to the fact that specimens of this species are found further north than any other species in the genus Zanomys.

MATERIAL EXAMINED

Holotype ♂; 12 ♀♀; 1 immature.

DISTRIBUTION

Western Oregon, southwestern Washington (Fig. 433).

RECORDS

OREGON: Benton County: 9 Mi. W. Philomath (AMNH); Jackson County: Ashland (AMNH); Ashland Summit, Hwy 99 (AMNH); Linn County: big meadows N. of Santiam Pass (AMNH); Washington County: Forest Grove (AMNH);

WASHINGTON: Clark County: Vancouver (northwest of town) (AMNH).

Zanomys californica (Banks)

(Figs. 168 - 170, 369 - 370, 433)

Dictyolathys californica Banks, 1904:343.

HOLOTYPE: Female, presumed destroyed.

TYPE LOCALITY: CALIFORNIA: Santa Clara County: Palo Alto. Baker, collector.

Dictyolathys californica:Banks, 1910:18.

Dictyolathys californicus:Chamberlin and Gertsch, 1958:8.

Scotolathys californica:Bonnet, 1958:3963.

Zanomys californica:Chamberlin, 1948:17. Roewer, 1954:1376. Lehtinen, 1967:276.

DESCRIPTION

Male. Color. Carapace uniform light brown with dusky markings on some specimens. Femora of legs paler than carapace. Legs darkened

distally. Legs with annulations. Palpi colored as legs. Chelicerae same color as carapace. Endites of palpi and labium same color as legs distally. Sternum yellow in central area, dark dusky markings laterally. Opisthosoma dark gray, almost black. Dorsum as in figure

Structure. Total length about 1.5 to 1.75 mm. Carapace extremes 0.75 to 0.81 mm long, 0.6 to 0.63 mm wide. Eyes as in Z. kaiba.

Female. Color. Female colored as male.

Structure. Total length about 1.6 to 2.3 mm. Carapace extremes 0.67 to 0.8 mm long, 0.5 to 0.63 mm wide. Eyes as in male.

FIELD NOTES

Males of this species were collected from December to May. Females were collected from December to July. Specimens of this species were collected in dry leaf litter, particularly oak leaf litter, and in leaf mold.

MATERIAL EXAMINED

34 ♂♂; 76 ♀♀; 9 immatures.

DISTRIBUTION

California (Fig. 433).

RECORDS

CALIFORNIA: Butte County: Chico (AMNH); Calaveras County: 6 Mi. N. Ione (AMNH); Contra Costa County: Mt Diablo (AMNH); El Dorado County:

nr Nashville (AMNH); Humboldt County: Carlotta (AMNH); Los Angeles County: Montrose (AMNH); Monterey County: Hastings Natural History Reserve (AMNH); Napa County: 4 Mi. W. Oakville (AMNH); Orange County: Laguna Beach (AMNH); Placer County: Dutch Flats (AMNH); 4 Mi. N. Newcastle (AMNH); Sacramento County: Folsom Lake State Park, Horseshoe Bar area (AMNH); San Bernardino County: Arrowhead Lake (AMNH); 0.5 Mi. N.W. Cajon (AMNH); Mills Creek Canyon (AMNH); San Diego County: Boulevard (AMNH); 10 Mi. E. Julian (AMNH); Santa Clara County: Palo Alto (CAS?); nr Palo Alto (AMNH); Tehama County: Buck Springs (AMNH); Yolo County: 6 Mi. N. Rumsey (AMNH); 5.4 Mi. S. Winters (AMNH).

Zanomys hesperia Leech, new species

(Figs. 171 - 172, 434)

Zanomys hesperia Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: Marin County: S.P. Taylor State Park.
December 13, 1954. J. Helfer, collector.

DESCRIPTION

Male. Color. Carapace light yellow brown dusky streaked. Central dusky patch immediately anterior to thoracic groove. Legs about same color as carapace. Legs with distinct annulations. Palpi paler than legs. Chelicerae about same color as carapace. Endites of palpi and labium same color as coxae. Sternum shiny dusky yellow. Opisthosoma as in Z. californica (Fig. 370).

Structure. Total length 1.95 mm. Carapace 0.88 mm long, 0.73 mm wide. Eyes as in Z. kaiba.

Female. Unknown.

REMARKS

The name for this species is derived from the Greek word hesperia, meaning western. Both legs of the third pair have fallen off the holotype.

MATERIAL EXAMINED

Holotype ♂.

Zanomys ochra Leech, new species

(Fig. 371, 435)

Zanomys ochra Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: UTAH: Juab County: 10 Mi. N. Lynndyl. November 17, 1951. D.E. Beck, collector. (ex.: nest of Neotoma lepida).

DESCRIPTION

Male. Unknown.

Female. Color. Prosoma and appendages pale golden yellow. Opisthosoma cream white.

Structure. Total length about two mm. Carapace extremes 0.75 to 0.8 mm long, 0.5 to 0.65 mm wide. AME smallest eyes, ALE largest. AME elyptical. PME only slightly larger than AME. AME about diameter or slightly less of one AME apart. PME distinctly more than diameter of one PME apart.

FIELD NOTES

Females of this species were collected in March, April, and November. The holotype was collected in the nest of Neotoma lepida.

REMARKS

The name for this species is derived from the Greek word ochra, meaning pale. This is in reference to the color of the specimens. Lynndyl is in Millard County, Utah, but the locality "10 Mi. N. Lynndyl" is in Juab County. This species is very similar to Z. feminina, and probably closely related.

MATERIAL EXAMINED

Holotype ♀; 11 ♀♀; 8 immatures.

DISTRIBUTION

Utah south to Arizona, west to California (Fig. 435).

RECORDS

ARIZONA: "34°N, 111°W" (UU).

CALIFORNIA: Kern County: Walker Pass (AMNH).

UTAH: Juab County: 10 Mi. N. Lynndyl (AMNH); Utah County: Lehi (AMNH).

Zanomys feminina Leech, new species

(Figs. 372 - 373, 435)

Zanomys feminina Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: San Diego County: Mount Laguna, 10 Mi.
N. Pine Valley. 6000 ft. alt. March 29, 1960. W.J.
Gertsch, W. Ivie, and R. Schrammel, collectors.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace golden yellow, darkened slightly anteriorly. Dusky patch at posterior central area of cephalic region. Legs about same color as carapace. Palpi slightly paler than legs. Chelicerae about same color as carapace. Endites of palpi and labium same color as legs. Sternum bright yellow with dusky margins. Opisthosoma dark gray with many large white patches. Dorsum as in Fig. 373 .

Structure. Total length about 2.5 to 2.6 mm. Carapace extremes 0.85 mm long, 0.6 to 0.65 mm wide. AME smallest eyes, ALE largest. AME elliptical. AME touching, or at least less than radius of one AME apart. PME about diameter of one PME apart.

REMARKS

The name for this species is derived from the Latin word feminina, meaning feminine. This is in reference to the fact that at this time females only are known for the species.

MATERIAL EXAMINED

Holotype ♀; 1 ♀.

DISTRIBUTION AND RECORDS

See type locality above (Fig. 435).

Zanomys ultima Leech, new species

(Figs. 374, 434)

Zanomys ultima Leech, new species.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: CALIFORNIA: Monterey County: Pacific Grove.

August 15, 1931. W. Ivie, collector.

DIAGNOSIS

The long, convoluted copulation tubules distinctly visible inside the anteriorly diverging bursae copulatrices on specimens cleared with clove oil distinguish this species from all others in the genus Zanomys in the Nearctic Region.

DESCRIPTION

Male. Unknown.

Female. Color. Female colored as Z. californica.

Structure. Total length about 1.5 to 1.8 mm. Carapace extremes 0.7 to 0.73 mm long, 0.6 to 0.63 mm wide. AME smallest eyes,

ALE largest. AME elliptical, almost twice as long as wide. PME only slightly smaller than ALE. PME about diameter of one PME apart.

FIELD NOTES

Females of this species were collected in April, August, September, and December. Many of the penultimate instar males collected on September 1, 1931, at Pacific Grove, were just about to moult when collected.

REMARKS

The name for this species is derived from the Latin word ultima, meaning last or final. This is in reference to the fact that it is the final new species of the genus Zanomys being considered here.

MATERIAL EXAMINED

Holotype ♀; 26 ♀♀; 17 immatures.

DISTRIBUTION

San Francisco Bay area south to Los Angeles County, California (Fig. 434).

RECORDS

CALIFORNIA: Alameda County: Berkeley (AMNH); Los Angeles County: Palmdale (AMNH); Monterey County: Pacific Grove (AMNH); San Luis Obispo County: San Simeon Beach (AMNH); San Mateo County: 4 Mi. W. San Mateo (AMNH); Santa Cruz County: Felton (AMNH).

Subfamily Arctobiinae, NEW SUBFAMILY

Arctobiinae Leech, NEW SUBFAMILY.

TYPE GENUS: Arctobius Lehtinen, 1967:215.

REMARKS

The subfamily Arctobiinae contains only the genus Arctobius, and the species Arctobius agelenoides (Emerton). The species Arctobius agelenoides is morphologically very different from all other species of amaurobiid in the Holarctic Region, and does not have any close relatives. It is a northern Holarctic endemic species.

DIAGNOSIS OF THE SUBFAMILY Arctobiinae

Eyes of both rows approximately equally-spaced, with PME slightly closer to one another than to PLE. From anterior aspect, AER slightly procurved, PER strongly procurved. From dorsal aspect, both eye rows appear as straight line. Carapace of female narrowest at cephalic groove. Cephalic part of carapace much raised above thoracic part (much as in members of genus Dictyna). Cribellum bipartite. Chelicerae robust, geniculate at base anteriorly. Cheliceral boss very distinct. Chelicerae of female as wide as or wider than cephalic part of carapace. Two teeth on promargin of fang furrow. Two or three teeth on retromargin of fang furrow. Calamistrum absent in male, well-developed in female, where it occupies about 40 - 45% of length of Metatarsus IV, and is not delimited by spine at either end. Leg length index 4:1:2:3.

Genus Arctobius LehtinenArctobius Lehtinen, 1967:215.

TYPE SPECIES: Amaurobius agelenoides Emerton, 1919:106, by original designation and monotypy.

REMARKS

Lehtinen placed the new genus Arctobius in the subfamily Macrobulinae, which is based on the genus Macrobulus Tullgren, 1901:248. However, the carapace shape, relative eye sizes, eye row structure, spination of the legs, and palpal organs of members of the two genera are dissimilar.

DIAGNOSIS OF THE GENUS Arctobius

See subfamily definition above.

Arctobius agelenoides (Emerton)

(Figs. 173 - 176, 38 - 385, 437)

Amaurobius agelenoides Emerton, 1919:106.

LECTOTYPE: Here designated. Male, CNC.

TYPE LOCALITY: ALBERTA: The Whistlers (mountain, 52°50'N, 118°08'W), Jasper National Park. August 29, 1918. C.G. Hewitt, collector.

Amaurobius agelenoides:Emerton, 1920:324. Bonnet, 1955:275.Hesperauximus agelenoides:Chamberlin, 1947:18. Roewer, 1954:1368."Hesperauximus" agelenoides:Bishop, 1949:104.

Arctobius agelenoides:Lehtinen, 1967:215.

DIAGNOSIS

This is the only Nearctic species of Amaurobiidae where specimens have two yellow stripes on the dorsum of the opisthosoma.

DESCRIPTION

Male. Color. Thoracic region of carapace edged with pale orange yellow, center mottled and streaked light brown. Posterior central part of cephalic region yellow, darkened anteriorly and dorsally to light brown, and dark brown at clypeus and anterior margin. Femora of legs about same color as edge of thoracic region of carapace. Legs darkened distally. Palpi darker than legs. Legs with pale annulations on dorsal side from patellae distad. Chelicerae, labium and sternum dark brown, endites of palpi lighter brown. Chelicerae darker than sternum in some specimens. Opisthosoma light brown ventrally, darkened dorsally to almost black. Central anterior part of dorsum with rusty brown stripe flanked by yellow stripes, convergent posteriorly, extended from anterior margin to posterior margins of dorsum.

Structure. Total length about six to eight mm. Carapace extremes 2.9 to 3.7 mm long, 2.1 to 2.6 mm wide. PME smallest eyes, ALE largest. AME about 0.75 diameters of one AME apart. AME about 1.2 times as large as PME. PME approximately diameter of one PME apart.

Female. Color. Female colored as male.

Structure. Total length about seven to ten mm.

Carapace extremes 3.2 to 4.5 mm long, 2.2 to 3.0 mm wide. PME smallest eyes, ALE largest. AME about 0.75 diameters of one AME apart. AME about 1.3 times as large as PME. PME about two diameters of one PME apart.

FIELD NOTES

Males were collected from July to November. Females were collected from May to November. Specimens were found under rocks in talus slopes, under stones in dense coniferous woods, and under stones at limestone outcrops on mountains otherwise covered with much glacial moraine. Two egg sacs were collected, one in July, the other in September (the latter empty, but with female still guarding it). The former one contained four spiderlings and 11 eggs (probably unfertilized). The food of this species, judging from debris placed on the egg sac, consists mainly of ants and other spiders. Members of this species are extremely aggressive and will attack almost anything coming near the entrance of the hole (personal observation).

REMARKS

The label in the vial containing the lectotype reads, "Amaurobius agelenoides Emerton. Can. Ent. May 1919 Goat. Mt. Jasper, Alberta Aug. 29, 1918 C.G. Hewitt." Local authorities in the Canadian Wildlife Service and Delaney (in litt., June 19, 1970) have confirmed that The Whistlers (mountain) used to be called Goat Mountain - unofficially and locally.

Specimens of this species have also been collected in Finnish and Russian Lappland, and are indistinguishable from those found in North America. One male was collected in Lappland, but I have been unable to obtain and examine it. In some specimens the bright yellow stripes on the opisthosoma are slightly brownish.

MATERIAL EXAMINED

Lectotype ♂; 21 ♂♂; 33 ♀♀ (2 from Lappland); 65 immatures (2 from Lappland).

DISTRIBUTION

Holarctic. Western Canada, Alaska, Finland, and Russia (Fig. 437).

RECORDS

NEARCTIC REGION

CANADA

ALBERTA: Banff, Banff National Park (KABC) (MCZ); Lake Minnewanka, Banff National Park (RL); Sulphur Mtn (CNC) (RL); Cadomin Cave, Cadomin, 6000 ft. alt. (RL); Cypress Hills (RL); Edmonton (RL); George Lake, 53°57'N, 114°06'W (RL); "Jasper Park" (AMNH); Bald Hills, Maligne Range, Jasper National Park 52°43'N, 117°41'W, 7000 ft. alt. (RL); Medicine Lake, Jasper National Park, 4800 ft. alt. (MCZ); Mt Edith Cavell Road at 4210 ft. alt., OR 8 Mi. E. Mt Edith Cavell Teahouse, Jasper National Park (RL); Teahouse on Mt Edith Cavell, Jasper National Park, 6000 ft. alt. (RL); Goat Mtn (= The Whistlers), 52°50'N, 118°08'W (CNC); Meander River (town), 59°03'N, 117°42'W (AMNH).

BRITISH COLUMBIA: Manson Creek (at Post Office), Cassiar District (RL); Ross Lake, Yoho National Park, 5670 ft. alt. (MCZ).

MANITOBA: Roblaytin, 54°45'N, 100°59'W (DJB).

NORTHWEST TERRITORIES: Keewatin District: N.W. corner Nuelatin Lake at Mouth of Windy River (AMNH); Mackenzie District: Alexandra Falls, Hay River (AMNH); Deep Bay, Great Slave Lake (RL); Simpson Island, Great Slave Lake (RL); 5 Mile Portage, La Martre River (RL); Prelude Lake, E. of Yellowknife (AMNH).

SASKATCHEWAN: Besnard Lake (DJB); Lady Lake (DJB); Reserve (DJB).

YUKON TERRITORY: North Fork Pass, Mile 42, Ogilvie Mtns, 3500 ft. alt. (CNC); Milepost 700, Alaska Highway, 60°05'N, 130°25'W (AMNH); S. of Kloo Lake, 60°55'N, 137°53'W (AMNH); Squanga Lake, 60°27'N, 133°35'W (AMNH).

UNITED STATES

ALASKA: Circle Hot Springs (AMNH); Fort Yukon (AMNH); Matanuska (UU); Mt McKinley National Park (MCZ); Mt McKinley National Park, Mile Post 78, 3000 ft. alt. (AMNH); Mt McKinley National Park, Mile Post 80, 2 - 3000 ft. alt. (AMNH); Sheenjek River Valley, 68°36'N, 143°45'W (MCZ); Skagway (AMNH); Wasilla (AMNH).

PALEARCTIC REGION

FINLAND: Inari, Koppelo (AMNH).

RUSSIA: Kola Peninsula (ZMUH).

Subfamily Titanoecinae Lehtinen

Titanoecidae Lehtinen, 1964:303. 1967:380.

TYPE GENUS: Titanoeca Thorell, 1870:124.

REMARKS

Titanoecidae was first mentioned as a separate family by Lehtinen (1964:303), but he did not give any definition of this new family at that time. He wrote, "Separated from Dictynidae (LEHTINEN, unpublished).", then mentioned two species of Titanoeca and their distribution in Finland. I do not believe that any problems are solved here by creating a new family. Many of the features that Lehtinen (1967:380) lists as being non-amaurobiid, such as the globular egg sac, are shared by some amaurobiids (e.g., Arctobius agelenoides females make globular egg sacs that they can move about according to temperature and other weather preferences - personal observation) and dictynids. In fact, the habitus of female Titanoeca species with eggs is strongly suggestive of female dictynid species with eggs.

Lehtinen (1967:381) lists five genera (Titanoeca, Nurscia, Anuvinda, Pandava, and Goeldia) in the family Titanoecidae. These genera come from the Holarctic, Palearctic, Oriental to eastern Mediterranean, Oriental to northern Australia, and Neotropical Regions, respectively. The genus Titanoeca contains the most species (about 20), and Anuvinda and Nurscia the fewest species (one each).

DIAGNOSIS OF THE SUBFAMILY Titanoecinae

Palpal tibia of male with complicated arrangement of distal processes (Figs. 177, 179). Patellar process present or absent. Embolus coiled and tapered, long and thin, wire-like terminally. Embolus origin distally in alveolus, coiled dorsally above origin, and terminated about mid-ectal margin of palpal organ. Trichobothria, when present, short, hardly if at all, extended above other leg hairs, and of uniform length.

Genus Titanoeca Thorell

Titanoeca Thorell, 1870:124.

TYPE SPECIES: Aranea obscura Walckenaer, 1802:209, by original designation.

REMARKS

Bonnet (1959:4628 - 4634) lists 20 species, and Roewer (1954: 1372 - 1375) lists 25 species in the genus Titanoeca. The members of the genus Titanoeca are known from the Holarctic Region only, but only one species is known to be Holarctic in distribution.

Members of the genus Titanoeca strongly resemble those of the genus Goeldia, and differ from them mainly in details of the genitalia. The habitus of members of the genus Titanoeca is much like that of members of the genus Goeldia (personal observation).

DIAGNOSIS OF THE GENUS Titanoeca

Epigynum of female with T-shaped or triangularly-shaped plate (Figs. 375 - 378). Cribellum bipartite. Palpal patella of male plain, without process or protuberance. Palpal tibia with complicated arrangement of processes (Figs. 177, 179) Legs with few spines; spines not large and robust. Trichobothria short, hardly, if at all, extended above other leg hairs, and not increased in length distally on leg articles. Calamistrum in female about as long as entire length of Metatarsus IV, absent or vestigial in male. Metatarsus IV without closely-appressed leg hairs dorsally (= pseudocalamistrum, sensu Lehtinen, 1967:336 - 339).

Key to the Nearctic Species
of the Genus Titanoeca

- 1. Male 2
- Female 5
- 2 (1). Basal part of embolus nearly at right angle to palpus limb
length. Usually two or four small pale spots on dorsum of
opisthosoma and two small pale spots on venter of
opisthosoma brunnea Emerton, p. 268
- Basal part of embolus nearly parallel to palpus limb length.
Opisthosoma without spots 3
- 3 (2). Ejaculation tube on meso-ventral surface of palpus club-shaped
or only slightly hook-shaped (Fig. 178)
..... nigrella (Chamberlin), p. 251
- Ejaculation tube on meso-ventral surface of palpus distinctly
hook-shaped (Figs. 180, 182) 4
- 4 (3). Palpal tibial processes shaped as in Figure 179
..... silvicola Chamb. and Ivie, p. 258
- Palpal tibial processes shaped as in Figure 181
..... americana Emerton, p. 263
- 5 (1). Opisthosoma with two pale spots on venter, one beside the
other, between epigastric furrow and spinnerets. Secondary
spiral of copulation tube with two loops only (Fig. 382) .
..... brunnea Emerton, p. 268
- Opisthosoma without pale spots on venter. Secondary spiral of
copulation tube with five to seven loops (Figs. 379 - 381)... 6

- 6 (5). Secondary spiral of copulation tube with seven loops. Range:-
northeastern Mexico, eastern half of United States, and
southern parts of Ontario and Quebec americana Emerton, p. 263
- Secondary spiral of copulation tube with five or six loops... 7
- 7 (6). Metatarsi I and II with four spines visible at distal end
below (check all four legs). Secondary spiral of copulation
tube with five or six loose loops (Fig. 381). Bursa
copulatrix cylindrical or subcylindrical. Generally at
altitudes above 6000 ft in United States
..... silvicola Chamb. and Ivie, p. 258
- Metatarsi I and II with three spines visible at distal end
below (check all four legs). Secondary spiral of copulation
tube with five or six thick, tight loops (Fig. 379). Bursa
copulatrix usually club-shaped. Generally at altitudes below
6000 ft in United States nigrella (Chamberlin), p. 251

Titanoeca nigrella (Chamberlin)

(Figs. 177 - 178, 375, 379, 438)

Amaurobius nigrellus Chamberlin, 1919b:2.

HOLOTYPE: Female, MCZ, Type No. 374.

TYPE LOCALITY: CALIFORNIA: Los Angeles County: Claremont. Prof.

William A. Hilton, collector.

Amaurobius nigrellus:Bonnet, 1955:290.

Titanoeca nigrella:Roewer, 1954:1374.

T. flavicoma:Lehtinen, 1967:270 - 271.

NOTES ON SYNONYMY

Many specimens mentioned in the literature from western North America as T. americana should be referred to T. nigrella.

DESCRIPTION

Male. Color. Male much like male of T. americana.

Structure. Total length about four to 7.5 mm. Carapace extremes 2.05 to 3.1 mm long, 1.6 to 2.4 mm wide. PME smallest eyes, ALE largest. AME about 1.2 diameters or slightly more of one AME apart. PME about two diameters of one PME apart.

Female. Color. Female much like female of T. americana.

Structure. Total length about five to eight mm. Carapace extremes 2.0 to 3.2 mm long, 1.5 to 2.4 mm wide. AME and PME subequal in size. ALE largest eyes. AME slightly more than diameter of one AME apart. PME slightly less than two diameters of one PME apart.

FIELD NOTES

Males and females of this species were collected from April to September, with the peak of activity in late June. Egg sacs were found during July. Two egg sacs examined contained 43 eggs and 121 embryos respectively. The egg sacs are cream-colored, round, about five to eight mm in diameter, and covered lightly with small bits of debris. Specimens of this species were found under rocks and logs in sheltered areas.

REMARKS

The male is described here for the first time. Primavera, Chihuahua, Mexico, is about five miles west of Encillas in Cañon Santa Clara, 5500 ft. alt., and Ojo de los Encinos, Durango, Mexico, is presumably near Villa Ocampo, on Hwy 45, south of Parral, in oak woodland, at about 6200 ft. alt.

MATERIAL EXAMINED

Holotype ♀; 2 ♀ paratypes; 74 ♂♂; 356 ♀♀; 454 immatures.

DISTRIBUTION

Western and southern Nearctic. Western Canada, United States, and northwestern Mexico (Fig. 438).

RECORDS

CANADA

ALBERTA: Bow Island (RL); 19 Mi. N. Elkwater (RL); Laggan (= Lake Louise) (MCZ); Lethbridge (RL); Medicine Hat (AMNH) (RL).

BRITISH COLUMBIA: Clinton (RL); Osoyoos (KABC); Vaseaux Lake (ROM); Vernon (AMNH); Rattlesnake Point, nr Vernon (AMNH).

MANITOBA: Austin (MCZ).

UNITED STATES

ARIZONA: "Arizona" (MCZ); Apache County: Buffalo Crossing, Black River (AMNH); 10 Mi. N.E. Whiteriver, White Mtns (AMNH); 14 Mi. N.E. Whiteriver (AMNH); 17 Mi. N.E. Whiteriver, White Mtns (AMNH); Cochise County: 3 Mi. E. Apache (AMNH); S. Fork Cave Creek Canyon, Chiricahua

Mtns, 5800 ft. alt. (JAB); Turkey Creek, Chiricahua Mtns (AMNH); 3 Mi. W. Paradise, Chiricahua Mtns (AMNH); Portal (AMNH); Southwest Research Station, 5 Mi. W. Portal (AMNH); 7 Mi. W. Portal (AMNH); Painted Canyon Ranch W. of Portal (AMNH); S.E. corner Slaughter Ranch (AMNH); Coconino County: Flagstaff (AMNH); on rim of Grand Canyon (AMNH); Mormon Lake (AMNH); Oak Creek Canyon (AMNH); Maricopa County: Mormon Lake, nr Mesa (AMNH); Mojave County: Kaibab (AMNH); Navajo County: Showlow (AMNH); Whiteriver (AMNH); Lakeside, White Mtns (AMNH); Pima County: Santa Catalina Mtns (AMNH); Bear Canyon Camp Ground, 6500 ft. alt. (AMNH); Bear Wallow, Santa Catalina Mtns (AMNH); Hitchcock Picnic Area, Santa Catalina Mtns, 6000 ft. alt. (JAB); Mt. Lemmon Road, Santa Catalina Mtns (AMNH); Peppersauce Cave Canyon, Santa Catalina Mtns (AMNH); nr. Ranger Station, Mt. Lemmon, Santa Catalina Mtns (AMNH); Marshall Gulch, Santa Catalina Mtns, 7500 ft. alt. (JAB); Santa Rita Mtns, 5000 ft. alt. (JAB); San Pedro Vista, Santa Catalina Mtns, 7500 ft. alt. (JAB); Upper Sabino Canyon, Santa Catalina Mtns, 7500 ft. alt. (JAB); Summerhaven (AMNH); Santa Cruz County: Madera Canyon, Santa Rita Mtns (AMNH); Big Rock Camp, Madera Canyon, Santa Rita Mtns (UU); Roundup Camp, Madera Canyon, Santa Rita Mtns (AMNH); Yavapai County: Prescott (AMNH).

CALIFORNIA: Fresno County: Graveyard Lakes, vicinity Graveyard Peak, 10,000 ft. alt. (AMNH); Imperial County: Fish Springs, W. side Salton Sea (UU); Los Angeles County: Claremont (MCZ); Modoc County: 20 Mi. N. Canby (AMNH); Mono County: Montgomery Canyon (AMNH); Tioga Pass, 10,000 ft. alt. (AMNH); Mono and Tuolumne Counties: Sonora Summit (AMNH); San Bernardino County: Bluff Lake (AMNH); San Diego County: Jacumba (UU); Sierra County: 7 Mi. W. Sierra City (AMNH).

COLORADO: Chaffee County: Cottonwood Creek, 2700 m. alt. (MCZ);

O'Haver Lake, 2900 m. alt. (MCZ); El Paso County: Cripple Creek Stage Road, 5 Mi. S.W. Broadmoor, 7600 ft. alt. (MCZ); Fremont County: Rim of Royal Gorge (UU); Gunnison County: Biebel Springs, 7 Mi. N.E. Gunnison, 2800 m. alt. (MCZ); Gunnison, 2300 m. alt. (MCZ); Montezuma County: Yucca House National Monument (UU); Saguache County: Cochetopa Creek, 8000 ft. alt. (MCZ); 5 Mi. E. Cochetopa Pass, Cochetopa Hills, 2800 m. alt. (MCZ); Cochetopa Park, Cochetopa Hills, 9200 ft. alt. (MCZ); Teller County: Pike's Peak Canyon (AMNH).

IDAHO: Blaine County: Gimlet (UU); Canyon County: Notus (UU); Caribou County: Tincup Creek (UU); Elmore County: Boise River at mouth of North Fork, 43°42'N, 115°42'W (UU); Franklin County: Willow Flat Forest Camp, Cub River Canyon, Wasatch Mtns (AMNH); Idaho County: 10 Mi. N. Riggins (AMNH); Lemhi County: Salmon River Gorge, 30 Mi. S. Salmon (AMNH).

KANSAS: Wallace County: Wallace (MCZ); 39°N, 94°W (UU).

LOUISIANA: Grant Parish: Kisatchie National Forest (AMNH).

MONTANA: Cracker Lake, Glacier National Park, 6000 ft. alt. (MCZ); Between Lincoln and Gunsight Passes, Glacier National Park, 6500 - 7000 ft. alt. (MCZ); Gallatin County: 5 Mi. S. Taylor Fork, Gallatin River (AMNH); Granite County: Blue Nose Lookout, 8000 ft. alt. (AMNH); Park County: 12 Mi. N. Gardiner (AMNH); Ravalli County: Gird's Creek, Hamilton (AMNH).

NEBRASKA: Cherry County: Valentine (AMNH); Dawes County: Chadron (AMNH); Lancaster County: Lincoln (AMNH).

NEVADA: Elko County: nr Tonka (AMNH); 20 Mi. W. Wells (UU); Eureka County: 5 Mi. up Hilltop Canyon (UN); Lincoln County: Muddy River, 14 Mi. S.E. Moapa (UU).

NEW MEXICO: Grant County: Hwy 25, 29.1 Mi. N.E. Pinos Altos, 6300 ft. alt. (RL); McKinley County: 20 Mi. E. Gallup (UU); Otero County: Camp May White (AMNH); Cloudcroft (AMNH); Sandoval County: Jemez Springs (ANSP); Sierra County: Nogal Canyon, San Mateo Mtns, in Cibola National Forest, 30 Mi. N.W. Hot Springs (= Truth or Consequences), 6000 ft. alt. (AMNH); Socorro County: Bear Trap Camp, 28 Mi. S.W. Magdalena, 8500 ft. alt. (AMNH).

NORTH DAKOTA: Stutsman County: Jamestown (UU).

OREGON: Baker County: Burnt River, 5 Mi. N. Lime (AMNH); Lunch Creek, Dixie Pass, Blue Mtns (AMNH); 3 Mi. S. Durkee (AMNH); Grant County: John Day Gorge (AMNH); Harney County: Steen Mtns, 8 - 10,000 ft. alt. (AMNH); Jackson County: Ashland Peak, 7000 ft. alt. (AMNH); 45.3 Mi. E. Ashland (UU); Jefferson County: Fly Lake (AMNH); 10 Mi. N. Hay Creek (AMNH); Cow Canyon, Willowdale (AMNH); Lane County: 6 Mi. E. Wildwood Camp, Ochoco National Forest (AMNH); Malheur County: S.W. of Ontario (UU); Union County: Imbler (AMNH); Wallowa County: Aneroid Lake, Wallowa Mtns, 7600 ft. alt. (AMNH); Wheeler County: 15 Mi. S.W. Mitchell (AMNH).

TEXAS: Jeff Davis County: Ft. Davis (AMNH); Limpia Canyon, Davis Mtns, (AMNH); Nueces County: Driscoll, N. of Kingsville (AMNH); San Patricio County: ca. 8 Mi. N.E. Sinton (AMNH); Tarrant County: Ft. Worth (AMNH); Taylor County: Abilene (AMNH); Travis County: Austin (UU); Uvalde County: (AMNH).

UTAH: Beaver County: "Beaver Canyon" (UU); Beaver Canyon, 10 Mi. E. Beaver City (UU); Cache County: Beaver Mtn (AMNH); Davis County: Bountiful (AMNH); Great Salt Lake, N.W. of Farmington (UU); Grand County: Moab (UU); Juab County: 5 Mi. S.W. Eureka (UU); Piute County: Junction

(UU); Rich County: 12 Mi. S.W. Garden City (UU); Salt Lake County: City Creek Canyon, Salt Lake City (AMNH) (UU); Dry Canyon, Salt Lake City (UU); Parleys Canyon (UU); vicinity of Salt Lake City (UU); San Juan County: 30 Mi. S. Moab (AMNH); Sevier County: 2 Mi. E. Glenwood (AMNH); Richfield (AMNH); Uintah County: 4 Mi. S. White River, on Evacuation Creek, 5000 ft. alt. (MCZ); Utah County: W. side Utah Lake (UU); Wasatch County: Cobble Rest Camp, Provo River, Uinta Mtns (UU); Daniel (UU); Wayne County: Fruita (AMNH).

WASHINGTON: Chelan County: Chelan (AMNH); San Juan County: Spieden Island (MCZ); Stevens County: Cedar Lake, N. of Leadpoint (AMNH); Yakima County: Toppenish (AMNH); Wenass Valley (MCZ).

WYOMING: Carbon County: 8 Mi. S.W. Bottle Creek Camp, 8600 ft. alt. (AMNH); Goshen County: Torrington (UU); Sweetwater County: 2 Mi. W. Creston (CMNH); Teton County: Uhl Hill, E. of Signal Mtn, nr Moran (AMNH); S. Cascade Canyon Divide, Grand Teton National Park, 10,000 ft. alt. (AMNH).

MEXICO

BAJA CALIFORNIA: San Telmo de Arriba (AMNH).

CHIHUAHUA: Canon Prieta, nr Primavera (AMNH); Primavera, 5500 - 6000 ft. alt. (AMNH); San Jose Babicora (AMNH); Santa Barbara (AMNH).

DURANGO: Ojo de los Encinos (AMNH).

Titanoeca silvicola Chamberlin and Ivie

(Figs. 179 - 180, 376, 318, 439)

Titanoeca silvicola Chamberlin and Ivie, 1947a:15.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: UTAH: Salt Lake County: City Creek Canyon, near
Salt Lake City. June, 1934. Wilton Ivie, collector.Titanoeca silvicola:Chamberlin, 1947:22 (in part). Vogel, 1967:19.Titanoeca nigrella:Roewer, 1954:1375.Titanoeca nivalis (silvicola): Lindroth, 1957:108.Titanoeca flavicoma:Lehtinen, 1967:270.

NOTES ON SYNONYMY

Lehtinen (1967:270 - 271) synonymized a number of species names with Titanoeca flavicoma Koch (see also this section under T. americana).

I am not in agreement with the synonymies he proposes (e.g., see T.

americana and T. silvicola). Lowrie and Gertsch (1955:3) list T.

nivalis Simon as being found in the Grand Teton National Park area of

Wyoming. The spiders in question are members of the species named T.

nigrella. Most, if not all, of the specimens labelled T. nivalis Simon

from Scandinavia are to be referred to T. silvicola. I have compared

several male and female cotypes of T. nivalis Simon from the "Alpes"

(tubes 282 and B.436 coll. Simon) with specimens of T. silvicola.

Specimens of these two species are very similar to one another, but distinct from one another, particularly in details of the palpal organ.

T. nivalis, I believe, is restricted to southern Europe. For diagnostic figures of T. flavicoma and other European species of Titanoeca, see

the excellent paper by Hubert (1966:Figs. 1 - 9).

For some reason, Chamberlin (1947:22) synonymized Amaurobius nigrellus Chamberlin, 1919, with T. silvicola Chamberlin and Ivie, 1947, and wrote silvicola as the name of the species rather than nigrella. In any event, the synonymy is incorrect (see T. nigrella).

DIAGNOSIS

The figures given and the characteristics mentioned in the key distinguish the members of this species from all others in the genus Titanoeca in the Nearctic Region. Metatarsi I and II on females of this species have four distal spines visible when metatarsi are viewed from below (examine all four legs), whereas there are only three distal spines (examine all four legs) on females of T. nigrella.

DESCRIPTION

Male. Color. Color as in male of T. americana, except for overall slightly darker shade, and opisthosoma with indistinct pale area on dorsum anteriorly.

Structure. Total length about 4.5 to 5.5 mm. Carapace extremes 2.1 to 2.3 mm long, 1.8 to 1.9 mm wide. AME and PME subequal in size. ALE largest eyes. AME about 1.2 diameters or slightly more of one AME apart. PME almost two diameters of one PME apart.

Female. Color. Female about same as female of T. americana.

Structure. Total length about 4.5 to 7 mm. Carapace extremes 2.3 to 2.6 mm long, 1.6 to 2.0 mm wide. Eyes about as in male.

Females of this species have slightly greater body pubescence than those of T. americana.

FIELD NOTES

Males of this species were collected from April to July, with the peak of activity in late June and early July. Females were collected from April to October. Four egg sacs, collected during July, August and September, contained the following: 44 spiderlings (August); 41 eggs (July); 21 spiderlings and 1 unfertilized egg (September); and 27 spiderlings (September). Specimens were found under logs and stones in cool, sheltered places.

MATERIAL EXAMINED (including Palearctic material)

49 ♂♂; 157 ♀♀; 164 immatures.

DISTRIBUTION

Holarctic. Scandinavia, western North America from Alaska south to Arizona and New Mexico (Fig. 439).

NEARCTIC RECORDS

CANADA

ALBERTA: Lake Minnewanka, Banff National Park, 4800 ft. alt. (RL); Cypress Hills, 4000 ft. alt. (RL); Edmonton (RL); Jasper, Jasper National Park (RL); "Jasper National Park" (CNC); Lethbridge (RL); Medicine Hat (AMNH); Nordegg, 4300 ft. alt. (RL); 15 Mi. W. Ponoka (RL).
BRITISH COLUMBIA: Masset, Queen Charlotte Islands (MCZ); Oliver (CNC); Summerland (CNC); Peace River Bridge, Alcan Highway (CNC); Summit Lake,

Mile 392 Alaska Highway, 4200 ft. alt. (CNC).

MANITOBA: Roblaytin (DJB).

SASKATCHEWAN: Estevan (DJB); Frenchman River, nr Val Marie (DJB);
Kernan's Prairie, nr Saskatoon (DJB); Lady Lake (DJB); Nipawin (DJB);
Uranium City (MCZ); Wollaston Lake (ROM).

UNITED STATES

ALASKA: College, nr Fairbanks (UU); Ester, W. of Fairbanks (AMNH);
Fox (HEF); Matanuska River at Hicks Creek (UU); Matanuska Valley (UU);
Palmer (AMNH); Shaw Creek, Mile 289 Richardson Highway (AMNH).

ARIZONA: Coconino County: 20 Mi. S. Jacob Lake (AMNH).

CALIFORNIA: Plumas County: Dixie Creek, 12 Mi. W. Beckwourth (AMNH).

COLORADO: Archuleta County: Piedra, 7000 ft. alt. (MCZ); Boulder County: 4 Mi. N. Allenspark, Front Range, 8000 ft. alt. (MCZ); Science Lodge, 9500 ft. alt. (AMNH); Ward (AMNH); Chaffee County: Cottonwood Lake, Sawatch Mtns, 3000 m. alt. (MCZ); Eagle County: Gore Creek, Gore Mtns, 8500 ft. alt. (MCZ); Fremont County: Hayden Creek, Sangre de Cristo Mtns, 2400 m. alt. (MCZ); Gilpin County: Cold Spring Camp (7 Mi. N. Blackhawk), Front Range, 8500 ft. alt. (MCZ); Gunnison County: Almont, 7800 ft. alt. (MCZ); Avery Flats, East River Valley, Elk Mtns, 9700 ft. alt. (MCZ); Copper Creek Valley, Elk Mtns, 10,000 ft. alt. (MCZ); Copper Creek Valley, Elk Mtns, 10,500 ft. alt. (MCZ); Copper Creek Valley, Elk Mtns, 10,600 ft. alt. (MCZ); N. and E. side Crested Butte Mtn, Elk Mtns, 10,100 ft. alt. (MCZ); 8 Mi. S. Crested Butte Mtn, 8500 ft. alt. (MCZ); 1 Mi. S. Ohio Pass, West Elk Mtns, 3300 m. alt. (MCZ); Gothic, S. slope Virginia Peak, 10,200 ft. alt. (MCZ); 8 Mi. W. Monarch Pass (UU); Taylor River at One Mile Creek, 8100 ft. alt. (MCZ);

Hinsdale County: San Cristobal Lake, San Juan Mtns, 9200 ft. alt. (MCZ);
Jackson County: Cameron Pass, 10,000 ft. alt. (UU); Lake County: W. of
Twin Lakes, Sawatch Mtns, 2900 m. alt. (MCZ); Larimer County: Glen
Haven (MCZ); 10 Mi. W. Estes Park, Rocky Mtn National Park (AMNH);
Montrose County: Uncompaghre Plateau, 16 Mi. S.W. Montrose (AMNH);
Ouray County: Amphitheatre Camp, 1 Mi. S.E. Ouray, 2550 m. alt. (MCZ);
Park County: 2 Mi. N.E. Fairplay (AMNH); Rio Grande County: Beaver
Creek, San Juan Mtns, 8000 ft. alt. (MCZ); Highway Springs Camp Ground,
5 Mi. S.W. South Fork, 2550 m. alt. (MCZ); Saguache County: Cochetopa
Creek, 24 Mi. S.E. Gunnison, 2700 m. alt. (MCZ); San Juan County:
Silverton, 9500 ft. alt. (MCZ); Teller County: Pike's Peak, 10,000 ft.
alt. (AMNH).

IDAHO: Adams County: W. of New Meadows (UU).

MONTANA: Hidden Lake Pass, Glacier National Park, 7100 ft. alt. (MCZ);
Lake County: Moiese (HEF); Ravalli County: Moose Lake (AMNH).

NEW MEXICO: Chaves County: Roswell (MCZ); Sandoval County: Sandia
Mtns, along Ariz Hwy 44, at 8600 ft. alt. (WAS); San Miguel County:
El Porvenir (DCL); Taos County: Taos (AMNH).

SOUTH DAKOTA: Custer County: Jewel Cave, Black Hills (MCZ); Pennington
County: Horsethief Lake (MCZ); Sheridan Lake (AMNH).

UTAH: Kane County: Hwy 89, 1.2 Mi. N. Glendale at Virgin River (RL);
San Juan County: La Sal National Forest, 19 Mi. N. Blanding (UU);
Salt Lake County: Creek Canyon (AMNH); Sevier County: Fish Lake (AMNH);
North Mtns, Fish Lake (UU); Snow Creek, W. of Sevier (UU).

WYOMING: Converse County: Douglas (AMNH); Sublette County: 9 Mi. N.
Pinedale, nr Mulligan Park (MCZ); 12 Mi. N. Pinedale, Elk Horn State
Park (MCZ); Teton County: Signal Mtn, Grand Teton National Park (MCZ);

13 Mi. N. Old Faithful, Yellowstone National Park (UU).

Titanoeca americana Emerton
(Figs. 181 - 182, 377, 380, 439)

Titanoeca americana Emerton, 1888:453.

LECTOTYPE: Here designated. Male, MCZ.

TYPE LOCALITY: NEW HAMPSHIRE: Cheshire County: Mount Monadnock.

July 15, 1882. J.H. Emerton, collector.

Titanoeca americana:Gertsch and Davis, 1940:1. Chamberlin, 1947:21.

Kaston, 1948:518 (in part). Roewer, 1954:1374.

Bonnet, 1959:4629.

Titanoeca americana anopla Chamberlin, 1947:21.

HOLOTYPE: Female, AMNH.

TYPE LOCALITY: TEXAS: Jim Wells County: 12 Mi. N. Alice. June 6,

1941. S. and D. Mulaik, collectors. NEW SYNONYMY.

Titanoeca americana anopla:Vogel, 1967:19.

Titanoeca anopla:Lehtinen, 1967:271 (new status).

NOTES ON SYNONYMY

Examination of the holotype and paratypes of T. americana anopla, in particular the copulation tubes and spermathecae, reveals that the group of specimens so named is conspecific with specimens of T. americana, hence there is no need to recognize subspecies. Lehtinen (1967:270 - 271) synonymized T. americana and T. flavicoma Koch.

Kaston (1948:518) considered T. brunnea Emerton and T. americana to be conspecific. However, the two species are quite distinct (compare Figs. 181 - 182 with 183 - 184).

DESCRIPTION

Male. Color. Dark yellow orange to rufous red, darkened slightly anteriorly. Femora of legs about same color as carapace but with brown tinge. Legs of most specimens slightly paler distally. Palpi, except for darker cymbia, about same color as legs. Chelicerae rufous red, slightly darker than carapace. Endites of palpi, labium, and sternum, about same color as coxae. Opisthosoma dark gray, almost black in some specimens. Dorsum unmarked.

Structure. Total length about 4.5 to seven mm. Carapace extremes 2.1 to 3.2 mm long, 1.8 to 2.4 mm wide. AME subequal to PME in size. ALE largest eyes. AME about diameter of one AME apart. PME about 1.5 to 1.7 diameters of one PME apart.

Female. Color. Female colored as male except legs, endites of palpi, labium, and sternum dark brown.

Structure. Total length about 3.5 to 7.5 mm. Carapace extremes 1.9 to 2.8 mm long, 1.4 to 1.9 mm wide. Eyes as in male.

FIELD NOTES

Males of this species were collected from April to September, with late May and early June as the period of greatest number. Females were collected from May to November. Two egg sacs from Warrensburg,

Johnson County, Missouri, laid in June and early July, contained 25 and 85 eggs respectively. The egg sacs are round, about 7 to 8 mm in diameter, and covered lightly with debris as with egg sacs of members of the genus Goeldia. Specimens of this species were found under logs, bark, and rocks on the ground.

MATERIAL EXAMINED

Lectotype ♂; paratype ♀; 40 ♂♂; 82 ♀♀; 93 immatures; holotype ♀
Titanoeca americana anopla.

REMARKS

The vial containing the lectotype male also contains one female paratype, and one female of Titanoeca albomaculata (Lucas). Emerton probably obtained a specimen of T. albomaculata to compare it with one of T. americana.

DISTRIBUTION

New England west to Ontario, west to Colorado and south to Texas and New Mexico, and northwestern Mexico (Fig. 439).

RECORDS

CANADA

ONTARIO: Chatterton (CNC); 1 Mi. E. Heeney (ROM); Frank's Bay, Lake Nipissing (ROM); Pt. Pelee (ROM); Pelee Island (OSU); N. end Grenadier Pond, Toronto (AMNH); High Park, Toronto (ROM); Turkey Point (ROM); Wellington (ROM).

UNITED STATES

ARKANSAS: Carroll County: Goat Mtn, Berryville (MCZ).

COLORADO: Alamosa County: nr Mosca Pass, Sangre de Cristo Mtns, 9,000 ft. alt. (MCZ).

CONNECTICUT: Fairfield County: Norwalk (AMNH) (UU); Trumbull (AMNH); New Haven County: Branford (AMNH); Meriden (AMNH); New Haven (MCZ); Pine Rock, New Haven (MCZ); Westville (AMNH).

ILLINOIS: Bureau County: Princeton (AMNH); Kankakee County: Pembroke Township (CMNH); 10 Mi. S. Momence (CMNH); Lake County: Waukegan (AMNH).

INDIANA: Tippecanoe County: nr Purdue University, Lafayette (AMNH); Porter County: Dune Acres (AMNH).

IOWA: Warren County (UU).

KANSAS: Bourbon County: Redfield (AMNH).

MAINE: Hancock County: Champlain Mtn, Mt. Desert Island, 330 m. alt. (MCZ); "Mt. Desert" (AMNH).

MASSACHUSETTS: Middlesex County: Pepperell (MCZ); Townsend (MCZ).

MICHIGAN: Berrien County: Lakeside (CMNH); Calhoun County: Albion (MCZ); Jackson County: Wolf Lake (MCZ).

MISSOURI: Johnson County: Warrensburg (RL); Vernon County: Walker (MCZ).

NEBRASKA: Lancaster County: Lincoln (AMNH); Thayer County: Hubbell (AMNH).

NEW HAMPSHIRE: Carroll County: West Ossipee (AMNH); Cheshire County: Jaffrey (AMNH); Mt. Monadnock (MCZ).

NEW JERSEY: Bergen County: Ramsey (AMNH); Hunterdon County: Lambertville (AMNH); Ocean County: Horicon Lake, Lakehurst (AMNH);

Lakehurst (AMNH) (DJB).

NEW MEXICO: San Miquel County: Camp Luna, Las Vegas (MCZ).

NEW YORK: Nassau County: Bayville (MCZ); Orange County: Paradise (CU);

Suffolk County: Yaphank (AMNH); Tompkins County: Ithaca (CU) (MCZ);

Ulster County: West Shokan (AMNH).

OKLAHOMA: Cleveland County: Norman (MCZ).

PENNSYLVANIA: Centre County: Rockview (AMNH); Lackawanna County:

Carbondale (RL).

SOUTH DAKOTA: Custer County: Blue Bell, 4900 ft. alt. (MCZ); Custer

State Park (MCZ); Pennington County: Keystone (AMNH); Stanley County:

Ft. Pierre (UU).

TEXAS: Cameron County: 15 Mi. S.W. Harlingen (AMNH); Hays County:

(AMNH); Hidalgo County: Edinburg (AMNH); Jim Wells County: Alice

(AMNH); 12 Mi. N. Alice (AMNH); San Patricio County: ca. 8 Mi. N.E.

Sinton (AMNH).

VIRGINIA: Mary's Rock, Shenandoah National Park (AMNH); Shenandoah

National Park east of Luray (AMNH); Smyth County: Marion (AMNH).

WISCONSIN: Portage County: 7 Mi. N. Stevens Point (MCZ).

MEXICO

TAMAULIPAS STATE: N. end Ciudad Victoria (AMNH).

Titanoeca brunnea Emerton

(Figs. 183 - 184, 378, 382, 438)

Titanoeca brunnea Emerton, 1888:453.

TYPE SERIES: MCZ, not seen.

TYPE LOCALITY: CONNECTICUT: New Haven County: New Haven. J.H.
Emerton, collector.Titanoeca brunnea = Titanoeca americana:Kaston, 1948:518. Bonnet, 1959:
4628, 4629.Titanoeca brunnea:Chamberlin and Ivie, 1944:127. Chamberlin, 1947:21.
Roewer, 1954:1374. Lehtinen, 1967:271?.

NOTES ON SYNONYMY

I am not sure what Lehtinen (1967:271) means as regards this species. He writes, "T. brunnea Emert. 1888 and T. americana anopla Chamb. 1947 (New York) = T. anopla n. stat."

DESCRIPTION

Male. Color. Carapace pale uniform yellow orange. Legs about same color as carapace. Palpi, except for darker processes and cymbia, about same color as legs. Chelicerae dull brown orange. Endites of palpi, labium, and sternum all about same color as coxae. Opisthosoma dark gray, almost black with one pair of pale spots on venter. Dorsum laterally with paired pale spots or large, pale, blotchy areas. Dorsum of some specimens from Florida region with chevrons posteriorly. Some specimens from Arkansas region without dorsal marks.

Structure. Total length about four to five mm. Carapace extremes 1.95 to 2.2 mm long, 1.5 to 1.8 mm wide. AME smallest eyes, ALE largest. AME about diameter of one AME apart. PME about 1.2 diameters or slightly more of one PME apart.

Female. Color. Female with same color patterns as male, but very dull. Legs darkened distally.

Structure. Total length about 4.5 to 5.5 mm. Carapace extremes 1.8 to 2.4 mm long, 1.2 to 1.6 mm wide. AME smallest eyes, ALE largest. AME only slightly smaller than PME. AME slightly more than diameter of one AME apart. PME slightly more than diameter of one PME apart.

FIELD NOTES

Males of this species were collected from April to August, with later April to early May as the peak period of activity. Females were collected from February to July. Specimens were collected in leaf litter in woods.

REMARKS

This species is distributed over much the same region as T. americana.

MATERIAL EXAMINED

48 ♂♂; 69 ♀♀; 89 immatures.

DISTRIBUTION

New England south to Florida, west to Illinois and Arkansas
(Fig. 438).

RECORDS

CANADA

ONTARIO: Pelee Island (OSU).

UNITED STATES

ARKANSAS: Washington County: "Washington County" (HEF); Cove Creek
(HEF).

CONNECTICUT: Hartford County: Windsor (AMNH); Middlesex County:
Haddam (AMNH); New Haven County: New Haven (MCZ).

FLORIDA: Alachua County: Gainesville (UU); W. shore Lake Newnan, nr
Gainesville (UU); Newnan Lake (AMNH); 8 Mi. W. Gainesville (AMNH);
"Hernando County" (AMNH); Putnam County: Interlachen (UU).

GEORGIA: Chatham County: 3 Mi. S.E. Savannah (UU); Fulton and De Kalb
Counties: Atlanta (AMNH); Screven County: 1 Mi. N. Sylvania (UU);
Stephens County: Toccoa (UU).

ILLINOIS: Jackson County: natural bridge nr Pomona (JAB) (AMNH);
Macoupin County: Gillespie (AMNH); Montgomery County: Litchfield
(AMNH); Pope County: Lusk Creek (JAB); Shawnee National Forest, Dixon
Springs (AMNH).

MARYLAND: "Montgomery County" (UU).

MASSACHUSETTS: Barnstable County: Wellfleet (MCZ); Middlesex County:
Groton (MCZ); Tyngsboro (MCZ); Walden Pond area, nr Concord (MCZ).

MISSOURI: Franklin County: Washington (AMNH).

NEW HAMPSHIRE: Stafford County: Durham (MCZ).

NEW JERSEY: Union County: Berkeley Heights (AMNH).

NEW YORK: Suffolk County: Coram (AMNH).

NORTH CAROLINA: Durham County: Duke Forest, Durham (JAB) (MCZ).

OHIO: Delaware County: Delaware (OSU); Fairfield County: Sugar Grove (UU); Hocking County: "Hocking County" (AMNH); Ash Cave State Park (WAS).

TENNESSEE: "Benton County" (AMNH); Knox County: 30 Mi. W. Knoxville (AMNH); Sullivan County: Bristol (UU); Wilson County: Cedars of Lebanon State Park (AMNH).

UNDETERMINED LOCALITIES: "Hammonds Pond (MCZ) - presumably in New England; and Monsett, South Carolina (AMNH).

Genus Goeldia Keyserling

Goeldia Keyserling, 1891:45.

TYPE SPECIES: Goeldia obscura Keyserling, 1891:45, by original monotypy.

Temecula O. Pickard-Cambridge, 1896:170.

TYPE SPECIES: Temecula mexicana O. P.-C., 1896:170, by original monotypy.

Aymarella Chamberlin, 1916:208.

TYPE SPECIES: Aymarella munda Chamberlin, 1916:209, by original monotypy.

NOTES ON SYNONYMY

The above-mentioned generic synonymies were proposed by Lehtinen (1967:236), and I am in agreement with him. Lehtinen (1967:236) writes also that the genus Calleva Simon, 1892, from Argentina, is a synonym of Goeldia, but I am unable to confirm this.

The combination Titanoeca obscura Keyserling, 1878:591, and Goeldia obscura Keyserling, 1891:45, are given for a female and a male, respectively, of the genus Goeldia. The combination Goeldia obscura is thus a junior secondary homonym. The oldest junior synonym available is Amaurobius (Titanoeca) patellaris Simon, 1893:434. Lehtinen (1967:236) writes that he will submit an application for the stabilization of this name. Simon (1904:86) suggested that Amaurobius (Titanoeca) patellaris Simon is a synonym of Goeldia obscura Keyserling, but I doubt this, as species of the genus Goeldia do not seem to have large or widespread

distributions. The Goeldia obscura referred to by Göldi (1892:222) is probably conspecific with Goeldia obscura Keyserling.

REMARKS

Figures 189 - 190, 191 - 193 are made from the type material of Goeldia obscura Keyserling and Titanoeca luteipes Keyserling for comparison with the Mexican species.

DIAGNOSIS OF THE GENUS Goeldia

Generic diagnosis of Goeldia is as Titanoeca, except that males of species in genus Goeldia with one large, medially-pointed process on palpal patella (Figs. 185, 187, 189, 191). Females with broad, flat, sclerotized plate with openings of copulation tubes at lateral edges of epigynal plate.

Goeldia mexicana (O. Pickard-Cambridge)

(Figs. 185 - 186, 383 - 384, 440)

Temecula mexicana O. Pickard-Cambridge, 1896:170.

HOLOTYPE: Male, BMNH.

TYPE LOCALITY: MEXICO: Tabasco State: Teapa. H.H. Smith,
collector.

Temecula mexicana: F.O. Pickard-Cambridge, 1902:359. Bonnet, 1959:4309.

Goeldia luteipes: Lehtinen, 1967:236 (in part).

NOTES ON SYNONYMY

Lehtinen (1967:236) synonymized Temecula mexicana and Titanoeca tizamina Chamberlin and Ivie, 1938:123, 129, with Titanoeca luteipes Keyserling, 1891:156, but these synonymies are incorrect.

DIAGNOSIS

T. mexicana is not even vaguely similar to T. luteipes in either the details of the male palpus or the coloring of the legs. The legs of the holotype of T. mexicana are pale from the patellae distad, whereas those legs of a male specimen from the type series of T. luteipes are very pale from the middle of the femora distad. The patellar process of T. luteipes is fat-conical and pointed upward, whereas that of T. mexicana is blunt-tapered and pointed medially (compare Figs. 185 - 186 with 191 - 193). The palpal conductor of T. luteipes is long and slender, whereas that of T. mexicana is short (compare Fig. 186 with 193). The figures given of the male palpal parts are nearly identical with those of the holotype male.

The short conical patellar process on male members of mexicana distinguish it from the only other known species of Goeldia in Mexico, G. chinipensis, the members of which have a long, curved patellar process.

DESCRIPTION

Male. Color. Color probably much like that of Titanoeca americana (all males before me are either teneral or have been dried out).

Structure. Total length about 4.5 to 5.5 mm. Carapace extremes 2.05 to 2.25 mm long, 1.5 to 1.7 mm wide. AME smallest eyes, ALE largest. AME about 1.6 diameters of one AME apart. PME about 1.7 diameters of one PME apart. PME about 1.4 times as large as AME.

Female. Color. Color much like that of Titanoeca americana except legs slightly paler than carapace.

Structure. Total length about 4.5 to 6 mm. Carapace extremes 2.0 to 2.3 mm long, 1.4 to 1.7 mm wide. AME smallest eyes, ALE largest. AME only slightly smaller than PME. AME slightly more than diameter of one AME apart. PME about 1.4 to 1.6 diameters of one PME apart.

FIELD NOTES

One egg sac with 19 eggs was collected with female guarding eggs on August 28, 1967, near Zanatepec, Oaxaca, Mexico. The egg sac is round, about 3 mm in diameter, and lightly covered with debris.

MATERIAL EXAMINED

Holotype ♂; 2 ♂♂; 17 ♀♀; 25 immatures.

DISTRIBUTION

Central and southern Mexico (Fig. 440).

MEXICAN RECORDS

MEXICO: Chiapas State: "El Real Portrero" (AMNH); San Cristobal de las Casas (AMNH); Tonina, 15 Km. E. Ocosingo (AMNH); Oaxaca State:

Airport, Huautla (AMNH); Monte Alban (AMNH); 4 Mi. N.E. Oaxaca, 5325 ft. alt. (RL); San Filipe (AMNH); Tolosa (AMNH); 10 Mi. S. Tomellin (AMNH); 13.8 Mi. W. Zanatepec, 260 ft. alt. (RL); Tabasco State: Teapa (BMNH); Veracruz State: Hwy 180, 24.4 Mi. N.W. Alvarado, 25 ft. alt. (RL); Ciudad Mendoza, 18°47'N, 97°11'W (AMNH); La Buena Ventura (AMNH); W. side Lago Catemaco (AMNH); Orizaba, 4000 ft. alt. (AMNH); Presidio, Cordoba (AMNH).

Goeldia chinipensis Leech, new species

(Figs. 187 - 188, 440)

Goeldia chinipensis Leech, new species.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: MEXICO: Chihuahua State: Crest above Chinipas towards Milpillas (approx.: 27°17'N, 108°35'W). ca. 6000 ft. alt. February 1, 1969. Vince D. Roth, collector.

DIAGNOSIS

The large curved patellar process on the palpus of male members of this species distinguishes them from those of mexicana, the members of which have a short conical process (compare Fig. 185 with 187). The diagnostic characteristics of chinipensis are very similar to those of Goeldia obscura Keyserling, from Brazil (Figs. 189 - 190).

DESCRIPTION

Male. Color. (Both males before me have been dried and partially returned to original form, but color has darkened considerably.) Color about like that of species Titanoeca americana.

Structure. Total length about 5.5 mm. Carapace about 2.05 mm long, 1.8 mm wide. PME smallest eyes, ALE largest. AME slightly more than diameter of one AME apart. PME about 2.5 diameters of one PME apart. AME only slightly larger than PME.

Female. Unknown.

REMARKS

Chinipas is located at 27°22'N, 108°30'W, and Milpillas at 27°12'N, 108°39'W.

MATERIAL EXAMINED

Holotype ♂; 1 ♂ paratype.

DISTRIBUTION AND RECORDS

Known from type locality only (Fig. 440).

Genus Tugana Chamberlin

Tugana Chamberlin, 1948:17.

TYPE SPECIES: Scotolathys cavaticus Bryant, 1940:300, by original designation and monotypy.

REMARKS

The generic relationship of Tugana to other amaurobiid genera is obscure, as there are no males known. Lehtinen (1967:334) places the genus Tugana, along with four other genera, in the new subfamily Altellopsinae. However, a male specimen is known for only one of the genera (the ecribellate genus Rhoicinaria) that he places in this subfamily - the other four genera (all cribellate) are known only from female specimens. The cribellum is divided in members of the genus Tugana, but Lehtinen (1967:338) writes that it is not. He writes also that the other cribellate genera he places in this subfamily have an undivided cribellum.

Bryant (1948:345) described the genus Alauximus, and the members of this genus are six-eyed (as are those of the genus Tugana), but again no males are known. The epigynum figured for one of the species, Alauximus infumatus Bryant, 1948:345, is strongly suggestive of that for Tugana cavatica.

DIAGNOSIS OF THE GENUS Tugana

Six eyes in two triads, AME lacking. Chelicerae with four or five very small teeth on pro- and retromargins of fang furrow. Epigynum

with two lobes convergent posteriorly, but without spermathecae. Epigynum without posterior and median lobes. Cribellum bipartite (indistinct but definite). Labium wider than long. Leg articles with spines. Tarsal and metatarsal trichobothria absent or very short (as in the genera Titanoeca and Goeldia).

Tugana cavatica (Bryant)

(Figs. 387 - 389)

Scotolathys cavaticus Bryant, 1940:300.

HOLOTYPE: Female, MCZ.

TYPE LOCALITY: CUBA: Soledad, Vilches Cave. July, 1932. Bates and Fairchild, collectors.

Tugana cavatica: Chamberlin, 1948:17. Roewer, 1954:1375. Chamberlin and Gertsch, 1958:8. Lehtinen, 1967:272.

DIAGNOSIS

This is the only species considered in the study area that has six eyes. All others have eight eyes.

DESCRIPTION

Male. Unknown.

Female. Color. Carapace, endites, labium, sternum, and legs pale yellow with slight orange tinge. Chelicerae slightly darker than carapace. Opisthosoma cream white, with very indistinct chevrons posteriorly on dorsum.

Structure. Total length about 2.05 to 2.3 mm. Carapace extremes 0.81 to 1.02 mm long, 0.60 to 0.68 mm wide. Six eyes only, in two triads. AME lacking. Chelicerae with 5 small teeth on promargin, 4 on retromargin.

MATERIAL EXAMINED

Holotype ♀; 1 paratype ♀.

DISTRIBUTION

Known only from Cuba.

RECORDS

CUBA: Soledad, Vilches Cave (MCZ); Soledad (AMNH).

Subfamily Metaltellinae Lehtinen

Metaltellinae Lehtinen, 1967:335.

TYPE GENUS: Metaltella Mello-Leitão, 1931:94, by original designation.

REMARKS

Lehtinen (1967) erected the subfamily Metaltellinae, based on the genus Metaltella Mello-Leitão, 1931:94, and placed therein four Neotropical genera, namely Exlinea Lehtinen, 1967:234, Calacadia Exline, 1960:601, Metaltella Mello-Leitão, 1931:94, and Ciniflella Mello-Leitão, 1921:179.

The type of Metaltella argentinensis Mello-Leitão, 1931:94, the type species of the monotypic genus Metaltella, is in the Museum de La Plata (not in Buenos Aires, as suggested by Lehtinen, 1967:248). However, Gerschman de Pikelin and Schiapelli (in litt., 22 April, 1969) consider that, on the basis of a specimen (# 16318 in the Museum de La Plata) determined as Metaltella argentinensis by Mello-Leitão, M. argentinensis is a junior objective synonym of Auximus biseratus Tullgren, 1905:22. It is on the basis of this synonymy alone that I follow Lehtinen's classification.

Members of the genus Calacadia are ecribellate. The whereabouts of the type specimen of the monotypic genus Ciniflella is unknown, and Mello-Leitão's description of Ciniflella lutea, the type species of the genus Ciniflella, is sufficiently vague to render this name nomen dubium.

Lehtinen was not able to see type specimens of the genera Metaltella and Ciniflella.

DIAGNOSIS OF THE SUBFAMILY Metaltellinae

Labium distinctly longer than wide. Epigynum present as flattish plate with tooth on each side pointed posteromedially. Origin of epigynal teeth on lateral or anterior margins. Cribellum bipartite. Cheliceral fang furrows with two to six, occasionally seven, teeth on pro- and retromargins. Embolus long and thin, wire-like, ensheathed in folded conductor. Calamistrum vestigial in male, represented only by row of straight, slightly thicker leg hairs. Calamistrum in female about half as long as Metatarsus IV and delimited at each end by spine.

Genus Metaltella Mello-Leitão

Metaltella Mello-Leitao, 1931:94.

TYPE SPECIES: Metaltella argentinensis Mello-Leitão, 1931:94, by original designation.

Exlinea Lehtinen, 1967:234.

TYPE SPECIES: Clubiona rorulenta Nicolet, 1849:437, by original designation.

NOTES ON SYNONYMY

Leech (1971:in press) synonymized the genus Exlinea with Metaltella.

I have seen specimens of Clubiona rorulenta Nicolet, 1849, and have compared the characteristics of this species with those of Auximus biseratus Tullgren, 1905, and consider that these two species are congeneric, and further that both are congeneric with Amaurobius simoni Keyserling, 1878. The observable differences between these species are found in details of the male and female genitalia.

REMARKS

The genus Metaltella and its members originate in the Neotropical Region. Though there are few species (about five) described that are placed in this genus (e.g., Auximus plagiatus Simon), there are many undescribed species in the collection of the California Academy of Sciences (personal observation).

DIAGNOSIS OF THE GENUS Metaltella

See subfamily diagnosis above.

Metaltella simoni (Keyserling)

(Figs. 194 - 195, 390, 422)

Amaurobius tristissimus Holmberg, 1876:33. nomen dubium.

HOLOTYPE: Female, presumably lost.

TYPE LOCALITY: ARGENTINA: Near mouth of the creek Arroyo de Maldonado, where it flows into the Rio de la Plata.

Amaurobius tristissimus: Mello-Leitão, 1933:14. Roewer, 1954:1359.

Bonnet, 1955:296.

Amaurobius simoni Keyserling, 1878:585.

LECTOTYPE: Male, BMNH.

TYPE LOCALITY: URUGUAY.

Amaurobius simoni: Petrunkevitch, 1911:105.

Auximus crispus Mello-Leitão, 1941:117.

HOLOTYPE: Presumably Male, No. 14.665 in Museo de la Plata.

TYPE LOCALITY: ARGENTINA: Castro Barros (La Rioja).

Auximus crispus: Roewer, 1954:1361.

Metaltella simoni: Lehtinen, 1967:248. Leech, 1971:in press.

DIAGNOSIS

This is the only amaurobiid species found in the Nearctic Region specimens of which have five or six teeth on the pro- and retromargins of the chelicerae. All other species of amaurobiid in the study area

have four or fewer teeth on the fang margins.

DESCRIPTION

Male. Color. Carapace orange yellow in thoracic region darkened to brown in cephalic region. Legs about same color as thoracic region of carapace. Legs I slightly darker than other legs. Legs I darkened slightly distally. Palpi, except for darker cymbium, same color as legs. Chelicerae brown. Endites of palpi and labium brown. Sternum slightly darker than coxae. Opisthosoma mottled gray or gray black. Dorsum with indistinct pale chevrons posteriorly. Venter with four irregular stripes between epigastric furrow and spinnerets.

Structure. Total length about seven to 8.5 mm. Carapace about 1.4 to 1.5 times as long as wide. Lateral eyes larger than median eyes. AME about radius or slightly more of one AME apart. AME subequal to PME.

Female. Color. Carapace brown, darkened anteriorly. Legs about same color as carapace. Legs darkened slightly distally. Palpi about same color as legs. Chelicerae dark brown. Endites of palpi and labium brown. Sternum slightly darker than legs. Opisthosoma as in male.

Structure. Total length about eight to nine mm. Carapace about 1.5 times as long as wide. Lateral eyes larger than median eyes. AME about diameter of one AME apart. AME larger than PME.

FIELD NOTES

Specimens of this species are common in Mississippi and parts of Louisiana. They are found under logs. They build small webs attached to log and ground. Males and females are found together (personal communication, Dr. Leon Roddy, October 20, 1969).

REMARKS

This species originated in Argentina, Uruguay, and probably southern Brazil. The first Nearctic record for a member of this species is July 23 - 30, 1944, from Harahan, Louisiana. Amaurobius tristissimus Holmberg, 1876, is most probably the senior synonym of Amaurobius simoni Keyserling, 1878. However, the holotype (♀) is presumed lost, and the figure of the species given by Holmberg is inadequate to make identification positive. Thus the name A. tristissimus is a nomen dubium (as indicated by Lehtinen, 1967:248) and the name A. simoni takes priority. Auximus segmentatus Mello-Leitão, 1943, is probably a junior synonymy of A. simoni (as indicated by Lehtinen).

Two specimens, a male and a female, from Pearl River, St. Tammany Parish, Louisiana, were sent to D.J. Clark of the BMNH for comparison with the lectotype of Amaurobius simoni and found to be the same (Clark, in litt., 6 Feb., 1969). The male was also compared with males of Auximus crispus Mello-Leitão as determined by Mello-Leitão, and found to be the same (Clark idem.). Clark also compared a male of A. crispus with A. simoni and reports that, apart from size, they are identical (Clark, in litt., 22 Jan., 1969). I have examined specimens of the type species of the genus Exlinea, Clubiona rorulenta Nicolet,

1849, and Amaurobius simoni is definitely congeneric with Clubiona rorulenta.

MATERIAL EXAMINED

Seven ♂♂; 19 ♀♀; three immatures.

NEARCTIC DISTRIBUTION

Coastal Florida, Louisiana, and Mississippi (Fig. 422).

RECORDS

FLORIDA: Bay County: St. Andrews State Park (JAB).

LOUISIANA: East Baton Rouge Parish (AMNH); Orleans Parish: Jefferson Park, Harahan (CMNH); St. Tammany Parish: Pearl River (AMNH).

MISSISSIPPI: Jackson County: Ocean Springs, Along Ft. Bayou Road (MCZ).

Subfamily Desinae Pocock

Desidae Pocock, 1895:143.

TYPE GENUS: Desis, Walckenaer, 1837:610.

REMARKS

Members of the subfamily Desinae are endemic to the southern hemisphere, and mainly to the Australian Region. There are many Australian genera [Lehtinen (1967:325 - 329) lists 16 genera, and for New Zealand alone, Forster (1970) mentions 11 in the key to the New Zealand genera of Desinae, nine of which are new genera]. Forster, however, mainly on the basis of the structure of the tracheal system, removes Desinae from the Amaurobiidae (where Lehtinen places this subfamily), gives it family status, and places it in the superfamily Dictynoidea.

Some members of the subfamily Desinae are found in the intertidal and littoral zones (e.g., genera Desis and Amaurobioides, respectively), while others are terrestrial and arboreal (e.g., genera Ixeuticus and Matachia, respectively).

Forster (in litt., May 11, 1970) writes, "Unfortunately, the nominate genus Desis is probably the most divergent genus and possesses a number of obviously derived characteristics." Forster (idem) writes also, "At present no single character is diagnostic of this subfamily - ..."

DIAGNOSIS OF THE SUBFAMILY Desinae

(Adapted from Lehtinen, 1967:322, and Forster, 1970:21)

Eyes more or less in two straight rows. Chelicerae various from small and ventral to large and porrect. Epigynum weakly sclerotized but one pair of spinous processes present distally on each palpal tibia. Cribellum entire or divided.

Genus Ixeuticus Dalmas

Ixeuticus Dalmas, 1917:329.

TYPE SPECIES: Amaurobius martius Simon, 1899:421, by original designation.

DIAGNOSIS OF THE GENUS Ixeuticus

Cribellum divided. In female, calamistrum about 0.7 length of Metatarsus IV, and delimited at each end by spine. In male, calamistrum a row of long hairs, but nonfunctional as calamistrum. Epigynum with central plate flanked by two openings and laterally with a tooth or spike on each side pointing posteromedially. Chelicerae with three or four teeth on promargin, largest being second from midline of body, and with two teeth on retromargin, largest farthest from fang origin. Larger of retromarginal teeth closer to fang origin than largest of promarginal teeth. Embolus long, "S" shaped, origin at basal end of alveolus, termination at distal end of alveolus, and tibia of palpus with three short, ectodorsal processes. Eyes of posterior row almost equidistantly spaced. From above AER straight, or almost so, PER distinctly procurved. From front, AER slightly procurved, PER distinctly procurved. AME the largest eyes, PME smallest. AME almost twice as large as PME. MOA about as long as wide behind, and wider behind than in front. AME about radius of one AME apart, and about diameter of one AME from ALE. Eyes of PER widely-spaced, 2.5 - 3 diameters of one PME apart. Labium about as long as wide.

Ixeuticus martius (Simon)

(Figs. 196 - 197, 391, 436)

Amaurobius martius Simon, 1899:421.

TYPE SERIES: Male and female.

TYPE LOCALITY: NEW ZEALAND: French Pass, nr D'Urville Island.

Ixeuticus martius:Dalmas, 1917:330. Roewer, 1954:1369. Bonnet, 1957:

2322. Marples, 1959:335. Dondale, 1966:1188.

Forster, 1970:65. Leech, 1971:in press.

Hesperauximus sternitzkii Gertsch, 1937:4.

HOLOTYPE: Male, AMNH.

TYPE LOCALITY: CALIFORNIA: San Francisco County: San Francisco.

1936. R.F. Sternitzky.

Badumna (Ixeuticus) martius:Lehtinen, 1967:218.

NOTES ON SYNONYMY

Ixeuticus is not a subgenus of Badumna as suggested by Lehtinen, but a separate genus from Badumna. I have checked Thorell's (1890) original description, and find that one of the more significant differences is that Ixeuticus martius females lack a functional claw on the tip of the palpus, whereas the female of Badumna hirsuta Thorell has a pectinate claw. Also, the PME of I. martius are very much smaller than the AME, whereas Thorell suggests that the eyes of Badumna hirsuta are subequal.

Lehtinen places Ixeuticus (= Badumna sensu Lehtinen) in the subfamily Matachiinae. The members of this subfamily, as defined by Marples (1962:703)), inhabit hollow twigs, have an elongate, cylindrical

body, and have long chelicerae that are directed forward. However, the epigyna of the females and the palpal organs of the males indicate a very close relationship to members of the genus Ixeuticus.

DIAGNOSIS

The large AME, about 1.4 times as large as the ALE, of members of this species distinguish them from all other Amaurobiidae found in the Nearctic Region.

DESCRIPTION

Male. Color. Carapace pale orange brown in thoracic region, brown in cephalic region. Hairs clothing carapace white. Femora of Legs II to IV about same color as posterior margin of carapace, femora of Legs I slightly darker. Legs darkened distally. Palpi same color as femora of Legs II to IV. Chelicerae chestnut brown. Endites of palpi and labium brown. Sternum slightly darker than coxae. Opisthosoma pale tan brown. Dorsum with brown median stripe anteriorly, two longitudinal rows of brown spots lateral of center posteriorly. Other small brown spots scattered irregularly over surface. Venter unmarked.

Structure. Total length about five to 10.5 mm. Carapace proportions of smallest male 3.0 mm long, 2.1 mm wide, and of largest male 4.8 mm long, 3.5 mm wide. AME largest eyes, PME smallest. AME about a radius of one AME apart. AME at least 1.4 times as large as ALE. AME about 1.5 times larger than PME.

Female. Color. Carapace brown, darker in cephalic region. Hair clothing carapace white. Legs paler than carapace. Legs I darker

than Legs II to IV. All legs darkened slightly distally. Femora and patellae of palpi paler than legs, tibiae and tarsi same color as legs. Chelicerae dark brown, almost black. Endites of palpi and labium brown. Sternum darker than coxae. Opisthosoma as in male, only slightly darker.

Structure. Total length about 7.5 to 12.5 mm.

Carapace of one female 5.3 mm long, 3.7 mm wide, of another 3.6 mm long, 2.8 mm wide. AME largest eyes, PME smallest. AME slightly more than radius of one AME apart. AME about 1.4 times larger than ALE. AME about 1.5 times larger than PME.

REMARKS

The origin of this species is the New Zealand, Tasmania, and Australia area.

The earliest Nearctic record for this species is June 3, 1918, at San Francisco, California. Ixeuticus martius (Simon, 1899) is probably a junior synonym of I. candidus (Koch, 1872). Dondale (1966: 1190) mentioned that specimens of I. candidus are only about half the size of those of I. martius, but I have examined specimens of I. martius that are well within the size range of specimens of I. candidus, and that have the palpal and epigynal features as Dondale indicated for I. candidus.

MATERIAL EXAMINED

Holotype ♂ Hesperauximus sternitzkii; 44 ♂♂; 73 ♀♀; 79 immatures.

NEARCTIC DISTRIBUTION

Coastal California, inland to Sacramento, and Baja California
(Fig. 436).

RECORDS

UNITED STATES

CALIFORNIA: Alameda County: Berkeley (PRC); Castro Valley (AMNH);
Irvington (AMNH); Newark (AMNH); Marin County: Bolinas (AMNH); Mill
Valley (AMNH); Mendocino County: Anchor Bay (AMNH); Mendocino (MCZ);
Monterey County: Carmel (AMNH); Salinas (AMNH); San Diego County:
Encinitas (BJK); San Ysidro (AMNH); San Francisco County: Golden Gate
Park, San Francisco (AMNH); San Francisco (AMNH); San Mateo County:
"San Mateo" (UU); Colma (AMNH); Santa Barbara County: Santa Maria City
Limits (PRC); Santa Maria (AMNH); Santa Clara County: Cupertino (MCZ);
Palo Alto (AMNH); Santa Cruz County: Watsonville (AMNH); Sonoma County:
5 Mi. W. Petaluma (AMNH); Santa Rosa (AMNH); Yolo County: West
Sacramento (CAS).

MEXICO

BAJA CALIFORNIA: Santa Maria, 23 Mi. S. Colonia Guerrero (AMNH).

PHYLOGENY

The prerequisite of a discussion on evolutionary trends is the determination of plesiomorphic characteristics and, subsequently, determination of direction of change from the plesiomorphic to apomorphic condition. The results of such a study give a picture of a hypothetical, plesiomorphic progenitor that possessed these plesiomorphic characteristics, and permit one to develop a phylogenetic classification that reflects the most probable lines of evolution and shows the relationship of each extant taxon to one another and to the progenitor. In short, I agree with Delevoryas (1964:29 - 30) who wrote that "...the ultimate goal toward which all biologists should be striving is an understanding of the course of evolution.", and which was later modified by Ball (1966:134) who wrote that "...the study of evolution is the mainstream and unifying concept of biology...".

There has been little change in general morphology of spiders from the early Tertiary (Petrunkévitch, 1942, 1949, 1958, 1963) or late Cretaceous period (personal observation of a filistatid spider from 72 million year old Canadian amber from Alberta, and McAlpine and Martin, 1969) to the present. The palpal organ, calamistrum, cribellum, spinnerets, and most of the other characteristics found on spiders, including sexual dimorphism, must have originated sometime in the Paleozoic era, as they are so well-formed in the late Cretaceous (about 70 million years ago). The placement of spider genera within a given suborder, family, and subfamily is based on overall morphology and the presence or absence of specified organs, and common ancestry of the relevant taxa is assumed.

The characteristics of spiders most likely to be different from one genus to another and conversely, most uniform within a given genus, are the genitalia - the palpal organs of male and the epigyna of female spiders. My views concerning the phylogeny of the Nearctic Amaurobiidae are based on morphological similarities and differences of extant species, as fossils are unavailable. Figure 450 is a time-divergence dendrogram of the history of the Nearctic Amaurobiidae. It is based on the principle that similar organisms are related. Species that have many similar structures are closely related, while those which are less similar are more distantly related. The distance between branches of the dendrogram are not significant since the rate of divergence is unknown. Table I is a summary of the results of this study. The progenitors of the Nearctic Amaurobiidae, in addition to the characteristics given in the family diagnosis, probably also had the plesiomorphic characteristics listed in Table I.

The ancestral stock of Titanoecinae developed short thick trichobothria of uniform length, and thereby diverged from the ancestral stock of the Amaurobiinae and Arctobiinae, which had long thin trichobothria (branching point 1). Long thin trichobothria are frequently present in mygalomorph spiders (e.g., Antrodiaetidae, Theraphosidae), but rare or not present in the higher araneomorph spiders (e.g., Araneidae, Theridiidae). The mygalomorphs are terrestrial spiders and the higher araneomorphs are aerial spiders. An aerial spider relies mostly on vibrations in the web for information about its environment and not on direct contact with the substrate as do terrestrial spiders. Lehtinen (1967:418) regards the reduction of

trichobothria in araneomorphs to be correlated merely with the general reduction in size, but Forster (1970:17) feels that reduced trichobothria are not correlated with size and that reduction can be a derived characteristic within a given taxon.

The members of the genus Tugana resemble in general body form and external morphological characteristics the members of the other genera in the subfamily Titanoecinae, but do not appear to be closely related to them (branching point 2). The fact that members of the genus Tugana have only six eyes (AME lacking) suggests that in Cuba it is a long-isolated, apomorphic group. Until a male member of this genus is found, its relationship to the other titanoecine genera remains uncertain.

The male progenitors of the genus Goeldia developed a large medially-pointed process on each palpal patella, and thereby diverged from the members of the genus Titanoeca (branching point 3) and other titanoecine genera. The presence of a large palpal patellar process is an apomorphic characteristic as patellar processes are not present in other members of the subfamily Titanoecinae, and are rare in Amaurobiidae and spider families in general.

The ancestral stock of Arctobiinae developed a basally-warped-lamellar, distally-wire-like embolus, thereby diverging from the Amaurobiinae that have a basally-thick, arcuate, distally-slightly-flanged embolus (branching point 4). The embolus form in Arctobiinae is apomorphic (as no other amaurobiid group known to me has a similar form). Arctobius, the only genus at this time placed in the subfamily

Arctobiinae, has other characteristics (e.g., eye arrangement and size) that indicate its members are more apomorphic than those of Amaurobiinae.

The ancestral stock of Callioplus and Callobius developed spermathecae within the lateral lobes of the epigynum, whereas the ancestral stock of Amaurobius, Pimus, and Zanomys retained the spermathecae under the epigynal plate (branching point 5). Spermathecae within the lateral lobes of the epigynum is a characteristic condition found nowhere else in the family Amaurobiidae, whereas spermathecae under the epigynal plate is a characteristic condition found throughout the family Amaurobiidae and most other spider families.

The ancestral stock of Callioplus developed complicated palpal tibial processes thereby diverging from the ancestral stock of Callobius which retained the slightly simpler palpal tibial processes (branching point 6). Within the family Amaurobiidae, the palpal tibial processes are nowhere else as complicated as those possessed by members of the genus Callioplus, except in members of the genus Titanoeca, but the complicated arrangement of palpal tibial processes as found in members of the genus Titanoeca is of a completely different structure from those of members of the genus Callioplus.

The ancestral stock of the genus Pimus developed a long, thin, strongly-arcuate embolus in the male, and a large bulge in the middle of the posterior lobe of the epigynum of the female, and thereby diverged from the ancestral stock of members of the genera Amaurobius and Zanomys, whose members retained a short, thick, slightly-arcuate embolus

in the male, and a plain posterior lobe in the female (branching point 7). Within the Nearctic Amaurobiidae, a more complicated organ or set of organs is considered as being an apomorphic condition, and within each of the Nearctic genera that have the spermathecae under the epigynal plate, no epigyna are as intricate as those found in members of the genus Pimus.

The ancestral stock of the genus Zanomys lost the geniculate condition of the chelicerae and leg spines, and thereby diverged from the ancestral stock of Amaurobius which retained both of these characteristics (branching point 8). The characteristic conditions of members of the genus Zanomys are regarded as apomorphic, as they are not found in members of any other Nearctic amaurobiid genera.

Fig. 450.

450. Time-divergence dendrogram of the history of Nearctic Amaurobiidae.

Fig. 450

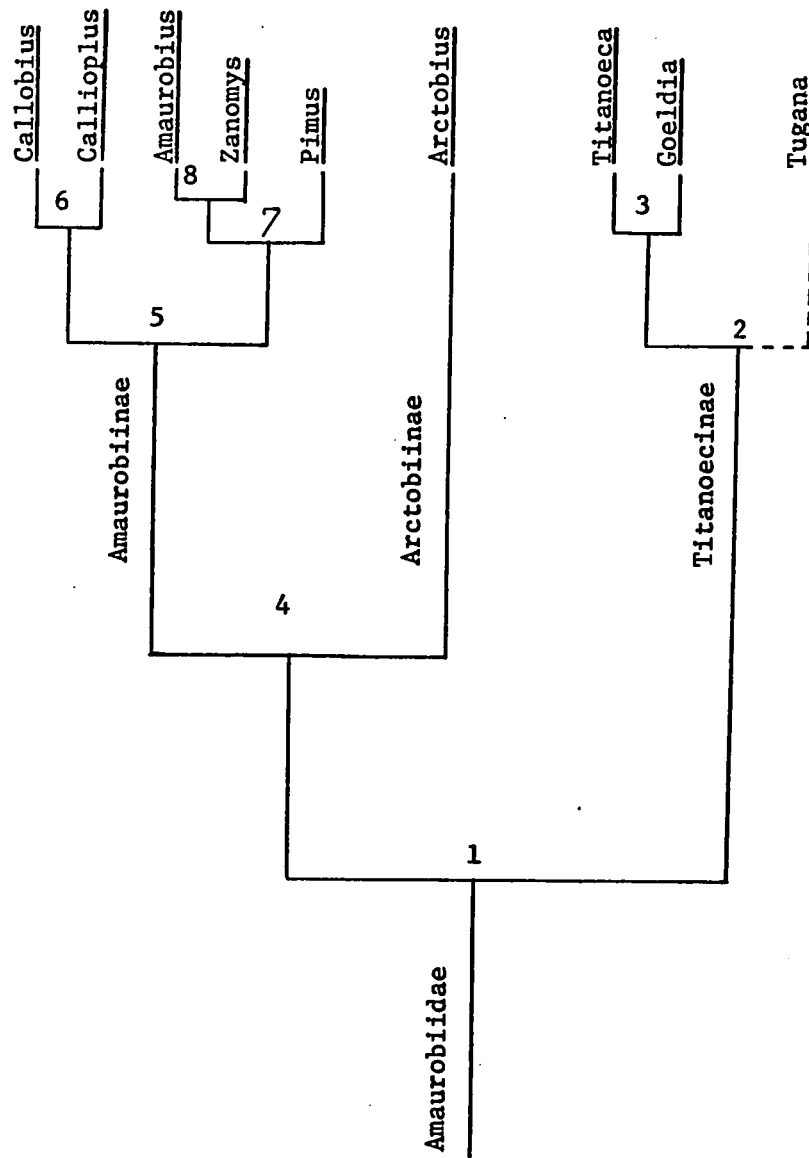


TABLE I

PLESIOMORPHIC vs. APOMORPHIC CHARACTERISTIC CONDITIONS
IN NEARCTIC AMAUROBIIDAE

Characteristic	Plesiomorphic	Apomorphic
Eyes	eight eyes, all approximately same size, in two rows, each slightly curved	six eyes (AME lacking); eye pairs within each row markedly different in size
Chelicerae	geniculate	not geniculate
Leg spines	present, usually robust	absent
Trichobothria	long and thin	short, thick, usually not extending above other leg hairs
Genitalia		
spermathecae	under epigynal plate	in lateral lobes
embolus	short, tapered, simple, slightly arcuate	wire-like, flanged terminally, warped-lamellar
tibial processes	simple, not subdivided	complex, two or more subprocesses on each major process
patellar process	absent	present

ZOOGEOGRAPHY

Introduction

As little is known about the distribution of most of the species of Nearctic Amaurobiidae, the following discussion is one of an introductory nature from which it is hoped that others may work.

The purpose of zoogeographic studies is to explain the present distribution of the taxa under consideration. As each animal taxon originated from a few ancestors in a limited area, the first aspect of a dynamic zoogeography pertains to dispersal (Udvardy, 1969:7), and if we understand the dispersal processes and movements of animals, much can be explained about their presence in or absence from a given place. Udvardy (1969:7) explains that the absence of an animal species from a certain area may be caused by ecological (it cannot exist there) or zoogeographical (it has not yet got there) reasons.

As the taxonomist-zoogeographer is handicapped by a lack of knowledge of geographic speciations and evolutionary rates, he must resort to working criteria or clues, and Darlington (1957:25 - 36) provides those which to him are the most important. Darlington (1957:35) stresses that each clue must be used with caution and with a full understanding of its limitations and implications and that a clue is a clue, not a proof. These clues are as follows:

1. Numbers clue - it is assumed that the origin of a group is the place where the largest numbers of genera and species of a given group of animals now occur.

2. Differentiation degree - it is assumed that there should be greater differences between genera and between species, and more endemism, where a family has been for a long time than where it has been for a short time.
3. Area extent - it is assumed that the area occupied by a given taxon increases directly with the taxon's age, and assuming rate of spread in all directions is equal, the place of origin of a given taxon is the center of the range.
4. Area continuity - it is assumed that a continuous distribution reflects a recent distribution and that a discontinuous distribution reflects an older or relict distribution.
5. Vicariant distribution - it is assumed that useful clues to a taxon's distribution history can be found by examining the distribution of related, competing, and associated taxa.
6. Fossil evidence - it is assumed that the right fossils in the right places are the best clues. However, as Darlington (1957:35) points out, fossils may show the evolution of a group, but not its geographic history.

in this study I rely mainly on the "numbers clue" of Darlington for determinations of origin, as it is the clue about which I have the most information. I have few other clues.

The Study Area

This study is restricted to the Nearctic Region and to the faunal elements of the Neotropical and Palearctic Regions that have entered the Nearctic Region. At the generic level, the amaurobiids

found in the study area reflect the boundaries generally recognized for this zoogeographic region (Darlington, 1957:411 - 475), except that the Neotropical genus Goeldia is represented by G. chinipensis as far north as Chihuahua, Mexico.

Within the Nearctic Region, numerous attempts have been made, starting in the mid 19th Century, to subdivide the region into various biotic zones, faunal zones, or provinces (Allen, 1892; Van Dyke, 1919, 1933, 1940; Dice, 1943, 1952 (1955); Hagmeier, 1966, to name but a few). Most of the aforementioned authors based their subregions on one group of animals only (e.g., beetles, mammals). Udvardy (1969:255) summarized the three essential features of the Dice (1943) biotic province as this: it is geographic; it delimits areas of typical composition of biotic communities; and since such large areas have biologically and topographically sharp boundaries only at large bodies of water, all other limits are arbitrary. The mapping and description of the biotic provinces in northern and eastern North America coincide more or less with the zonal plant formations and are large in size, whereas those in the west are small in size, numerous, and their boundaries complex, and coincide with topographical features.

At this stage in the knowledge of Nearctic amaurobiid distributions, I am, by and large, unable to use the provinces established by Dice (1943) and Hagmeier (1966), but am more able to use those of Van Dyke (1919, 1940), and Allen (1892). Van Dyke (1940) and Linsley (1958) have, based on carabid and cerambycid beetles respectively, a larger definition of the Vancouverian province than that used here.

An analysis of contemporary distributions of the genera and species suggests that the Nearctic amaurobiid fauna is a complex of subfaunas, nine of which are readily identifiable: Neotropical, Holarctic, Canadian and Hudsonian, Appalachian, Sonoran, Vancouverian, Great Basin, Sierran, and Californian (smaller western Nearctic elements sensu Van Dyke, 1919, and eastern and major western elements sensu Allen, 1892). The amaurobiid elements are of relatively recent derivation and endemism is expressed mainly at the species level only (Tables II and III).

The Nearctic distributions of the nonsynanthropic amaurobiid genera are given in Figs. 441 - 448. The disjunction seen in the distribution of the genus Amaurobius is most likely an artifact resulting from poor collecting in the states of Oregon and Washington. Figure 449 shows the number of species of amaurobiids plotted in 10° intervals throughout the Nearctic Region. The degree of western endemism is striking.

The Generic Origins

The genera Amaurobius, Arctobius, Callioplus, Callobius, and Titanoeca originated in the Palearctic Region and migrated to the Nearctic in the early Tertiary across Beringia (see Ball, 1963, Hopkins, 1967, Lindroth, 1963b, Linsley, 1963 for information pertinent to the Bering land bridge). The first four genera mentioned probably came across Beringia during a period when both broadleaf and coniferous forests were in the area, and Titanoeca came through Beringia either in

meadow areas in the forested regions or during a drier, thinly forested period. I base these statements about habitats and movements of the early members of these genera solely on information about extant species of these genera.

Goeldia is most probably a very recent immigrant to the Nearctic Region. It is most probable that the progenitors of this genus arrived in the Neotropical Region in the early Tertiary (Paleocene division) period from the Palearctic Region through the Nearctic Region during this period when North and South America were connected (Savage, 1966: 762, indicates that an isthmus was present during the Paleocene division). The genus Goeldia evolved during isolation in the Neotropical Region, and migrated north into Central America and Mexico during the Pliocene when the continents reconnected (see Lloyd, 1963, and others in same symposium for discussion on the tectonics of Central America).

The genus Tugana I consider to be an island isolate with Neotropical ancestors.

Within the Nearctic Region during the early Tertiary period, the genus Amaurobius was widespread in the forested regions. It was probably during this time that the ancestors of the genus Pimus became isolated from Amaurobius in the Sierra Nevada region of California, then spread northward and entered the Coast Range through the Mount Shasta-Trinity Mountains region in northern California.

I am uncertain about the origin area of the ancestors of the genus Zanomys, but it was most probably in or near the Great Basin, at

the time of the formation of the Rocky Mountains (Eocene, 49 million years ago) when some major climatic changes occurred.

TABLE II

Amaurobiid Faunal Elements in the Study Area

Region of Origin	No. of Endemic Genera in Province	No. of Genera in Province	No. of Species in Province
Neotropical	-	1	1
Holarctic	-	5	2
Can. and Huds.	0	5	9
Appalachian	0	4	10
Sonoran	0	4	7
Vancouverian	0	6	31
Great Basin	1*	3	11
Sierran	1	5	26
Californian	1*	4	15

* It is uncertain if the genus Zanomys originated in the Great Basin or Californian province, but the former is the more likely.

TABLE III

Amaurobiid Faunal Elements in the Nearctic Region

Species	Neo. Holarctic	Can. and Huds.	Appal.	Son.	Vanc.	G.B.	Sier.	Calif.
<u>Callioplus armipotens</u>		+						
<u>euoplus</u>	+							
<u>hoplites</u>		+						
<u>hoplomachus</u>		+						
<u>macarius</u>					+		+	
<u>pantoplus</u>		+						
<u>spenceri</u>					+			
<u>tibialis</u>	+		+					
<u>wabritaskus</u>	+				+			
<u>Callobius angelus</u>					+			
<u>arizonicus</u>				+				
<u>bennetti</u>	+		+					
<u>canada</u>							+	
<u>deces</u>					+			

TABLE III (continued)

Species	Neo. Holarctic	Can. and Huds.	Appal.	Son.	Vanc.	G.B.	Sier.	Calif.
<u>Callobius enus</u>								+
<u>gertschi</u>							+	
<u>hyonasmus</u>					+			
<u>kamelus</u>					+			
<u>klamath</u>							+	
<u>manzanita</u>							+	
<u>nevadensis</u>					+		+	
<u>nomeus</u>		+		+	+			
<u>olympus</u>					+			
<u>panther</u>							+	
<u>paskenta</u>							+	
<u>pauculus</u>					+			
<u>paynei</u>					+			+
<u>pictus</u>		+			+			
<u>rothi</u>					+			

TABLE III (continued)

Species	Neo. Holarctic	Can. and Huds.	Appal.	Son.	Vanc.	G.B.	Sier.	Calif.
<u>Callobius severus</u>		+			+		+	+
<u>sierra</u>							+	
<u>tamarus</u>						+		
<u>tehama</u>							+	
<u>Amaurobius agastus</u>								+
<u>barbaricus</u>								+
<u>borealis</u>		+		+				
<u>corruptus</u>					+			
<u>diablo</u>								+
<u>distortus</u>							+	
<u>dorotheae</u>							+	
<u>galeritus</u>							+	
<u>hagiellus</u>								+
<u>heathi</u>					+			
<u>intermedius</u>					+			

TABLE III (continued)

Species	Neo. Holarctic	Can. and Huds.	Appal.	Son.	Vanc.	G.B.	Sier.	Calif.
<u>Amaurobius latescens</u>					+			+
<u>mathetes</u>								+
<u>mephisto</u>								+
<u>minutus</u>							+	
<u>palomar</u>								+
<u>pilosus</u>					+			
<u>prosopidus</u>					+			
<u>tamalpais</u>					+			
<u>transversus</u>					+			
<u>triangularis</u>					+			
<u>tulare</u>							+	
<u>vexans</u>					+			
<u>Zanomys aquilonia</u>					+			
<u>californica</u>					+		+	+
<u>feminina</u>								+

TABLE III (continued)

Species	Neo. Holarctic	Can. and Huds.	Appal.	Son.	Vanc.	G.B.	Sier.	Calif.
<u>Zanomys hesperia</u>					+			
<u>kaiba</u>						+		
<u>ochra</u>					+			+
<u>sagittaria</u>								+
<u>ultima</u>					+			+
<u>Pimius desiccatus</u>							+	
<u>eldorado</u>							+	
<u>fractus</u>					+			
<u>hesperellus</u>							+	
<u>iviei</u>							+	
<u>leucus</u>							+	
<u>napa</u>					+			
<u>nawtawaketus</u>							+	
<u>pitus</u>							+	
<u>salemensis</u>					+			

TABLE III (continued)

Species	Neo. Holarctic	Can. and Huds.	Appal.	Son.	Vanc.	G.B.	Sier.	Calif.
<u>Arctobius agelenoides</u>	+	+						
<u>Goeldia chinipensis</u>				+				
<u>mexicana</u>	+			+				
<u>Titanoeca americana</u>			+	+				
<u>brunnea</u>			+					
<u>nigrella</u>				+	+	+	+	+
<u>silvicola</u>		+					+	
<u>Tugana cavatica</u>	+							

Discussion

The Neotropical Element.

The Neotropical faunal elements of Amaurobiidae in the study area are two species of the genus Goeldia, G. chinipensis and G. mexicana, and the species Tugana cavatica. Although the genus Goeldia is of Neotropical origin, the two species discussed here are both endemic in the Sonoran region. Members of the Cuban species Tugana cavatica are known only from Cuba. The source area of members of the genus Tugana is uncertain, though it was most probably the Neotropical Region.

The Holarctic Element.

The Holarctic elements of Amaurobiidae in the study area are the genera Amaurobius, Arctobius, Callioplus, Callobius and Titanoeca, and the species Arctobius agelenoides and Titanoeca silvicola. In view of the present northern Nearctic distribution of A. agelenoides, it is most likely that this species "wintered" the Wisconsin glaciation in the central Alaskan refugium, and radiated from there postglacially. It is also possible that this species retreated south of the Wisconsin ice. However, if it did, then specimens of this species would probably have been found further south than the presently-known distribution, as there have been more active collectors in the western United States than in western Canada. The present Nearctic distribution of this species reflects a marked preference for soils derived from limestone and other sedimentary rocks. The records of specimens of this species from the

Northwest Territories, especially that from Nueltin Lake, are well within the Precambrian Shield, but the collecting site at Nueltin Lake is on soils derived from sedimentary and shield rock. It is likely that populations of the species T. silvicola were isolated in central Alaska and Colorado during the Wisconsin glaciation, then rejoined post-glacially.

The Canadian and Hudsonian Elements.

Only three species, Amaurobius borealis, Callioplus euoplus, and Callobius nomeus, are found widespread throughout these faunal sub-regions. The remaining species known from here, except for Arctobius agelenoides, moved in postglacially from more southern adjoining areas. Members of the species A. borealis and C. euoplus probably retreated to the boreal forests along the southern margins of the Wisconsin ice, and then advanced northward with the boreal forests as the ice receded. The present distribution and habitat preferences of members of the species C. nomeus suggest that members of this species retreated to the mountainous areas of Colorado in the west and the Adirondack-White Mountain area in the east during the Wisconsin glaciation.

The Appalachian Element.

Within the Appalachian Mountains area, there are two smaller, distinct centers, one southern in the Great Smoky-Blue Ridge Mountain region, and the other northern in the Adirondack-White Mountain region. The significance of the southern region as a distinct distribution center has been emphasized by studies presented in a recent symposium (Holt, et al., 1969). The southern region contains four endemic species

of the genus Callioplus, namely C. armipotens, C. hoplites, C. hoplomachus, and C. pantoplus, that are known only from the vicinity of the Great Smoky-Blue Ridge Mountain region (see Figs. 413 - 416). The similarity between and the very confined distributions of the first three-mentioned species indicate that speciation has occurred fairly recently, probably during the late Tertiary period, in the Great Smoky-Blue Ridge Mountain region.

The northern distribution center, which was a refugium during the Pleistocene division, has its origin in the Mount Washington area of New Hampshire. The species Callioplus tibialis radiated from this center and is now found at least as far south as Long Island, New York, and as far north as the northern part of Newfoundland. This is the only species of amaurobiid that has a confined northeastern distribution. Lindroth (1963a) discussed the northeastern area, and wrote (1963a:109) that, "An analysis of carabids found above timberline, reveals a far-reaching affinity to the faunas of Nfld., Gaspé, and southern Labrador, but much less so to that of Nova Scotia, also concerning species with main areas in forest regions. This is against the generally held assumed idea that the entire fauna of northeastern North America is postglacially immigrated from the south." The other northeastern representatives of the family Amaurobiidae, namely A. borealis, C. bennetti, C. nomeus, Titanoeca americana and T. brunnea, are more widespread and the location of their source centers is less certain.

The Sonoran Elements.

The only amaurobiid species that originated in this region are the species Callobius arizonicus, Goeldia chinipensis, and G. mexicana. The present distribution of the species C. arizonicus suggests that it has been isolated from other members of the genus Callobius for some time. G. chinipensis and G. mexicana are discussed under Neotropical elements.

The Vancouverian Elements.

The Vancouverian area was designated by Van Dyke (1919), and extends from southern coastal Alaska to coastal California as far south as Monterey County (coastal parts of California called Humboldtian and Santa Cruzian districts by Schick, 1965). The members of Callobius pictus are found throughout this subregion. Of the 31 species of amaurobiids found in this subregion, 20 are considered to have had their origin there. I believe that the distribution of each species remained during the Pleistocene division much as it is today, with the possible exception of some species in the coastal areas of Alaska and British Columbia. Linsley (1958) in a study of cerambycid beetles, also found a number of endemic species in this subregion.

The Great Basin Elements.

Several of the species which originated in this subregion are widespread and overflow into one or more of the surrounding subregions (e.g., Callobius nomeus, Titanoeca nigrella), while others (e.g., Callobius hyonassus, C. kamelus) are known from a small part of the

Great Basin.

Of particular interest in the northern part of the Great Basin area is the Blue Mountain region of northeastern Oregon, and the adjacent areas in western Idaho and southeastern Washington. In this small area, there are three endemic species of the genus Callobius, two of which (C. kamelus and C. tamarus) are closely related to one another, but not to any other species in the genus Callobius, and a third (C. hyonasus), which does not seem to have any close relatives (the male of C. hyonasus is unknown, thus its relationship to other species is uncertain). Van Dyke (1919:11) mentioned, in passing, that the mountains of western Idaho contain a relict fauna.

The genus Zanomys and the species placed within it are endemic in the southwestern part of the United States, but it is impossible at this time to determine the source area of the group, as species of this group are also known from the Californian region.

The Sierran Element.

This subregion is somewhat isolated physiographically from the subregions surrounding it, and by internal barriers within it. Evidence of these barriers is expressed in amaurobiid spiders by the presence of at least one endemic genus (Pimus), and many endemic species of the genera Amaurobius, Callobius, and Pimus. Most of the species in this subregion are known from the type locality only or from very limited distributions.

The Californian Element.

The species found in this region are endemic species known only from the type locality and nearby localities (e.g., Amaurobius diablo), or species that have overflowed from adjacent subregions (e.g., Callobius severus).

Conclusions and Summary.

There are two major source centers of speciation of amaurobiids in the Nearctic Region, one eastern with two subcenters, and one western with many small subcenters. Over 60% of the species of amaurobiids originated in the Sierran and Vancouverian subregions. There are no genera endemic to the eastern source area, but there are two in the western. Five genera, but only two species, are Holarctic in distribution. Only one species is Neotropical and Nearctic in distribution.

REFERENCES

- Allen, J.A., 1892. The geographical distribution of North American mammals. Bull. Am. Mus. nat. Hist. 4:199 - 243.
- Ball, G.E., 1963. The distribution of the species of the subgenus Cryobius (Coleoptera, Carabidae, Pterosticus) with special reference to the Bering land bridge and Pleistocene refugia, p. 133 - 151, 9 figs. In Gressitt, J.L. (ed.), Pacific Basin biogeography, a symposium. Tenth Pacific Science Congress, Honolulu, Hawaii, 1961. Bishop Museum Press.
- Ball, G.E., 1966. A revision of the North American species of the subgenus Cryobius Chaudoir (Pterosticus, Carabidae, Coleoptera). Opusc. ent. (suppl. 28):1 - 166, 210 figs.
- Banks, N., 1898. Arachnida from Baja California and other parts of Mexico. Proc. Calif. Acad. Sci., 3rd Ser., Zool., 1(7):205 - 308, pl. 13 - 17.
- , 1904. Some arachnida from California. Proc. Calif. Acad. Sci., 3rd Ser., Zool., 3(13):331 - 376, pl. 38 - 41.
- , 1910. Catalogue of Nearctic spiders. Bull. U.S. natn. Mus. 72:iii + 80 p.
- Berland, L., 1932. Les arachnides (scorpions, araignées, etc.). Biologie systematique. Encyclopédie entomologique, Paris, 1932, 16:1 - 485, 634 figs. (spiders: p. 79 - 404.).
- Bertkau, Ph., 1882. Über das Cribellum und Calamistrum. Ein Beitrag zur Histologie, Biologie und Systematik der Spinnen. Arch. Naturgesch. 48:316 - 362, pl. 18.

- Bishop, S.C., and C.R. Crosby, 1926. Notes on the spiders of the southeastern United States with descriptions of new species. J. Elisha Mitchell scient. Soc. 41(3 and 4):165 - 212, pl. 20 - 25.
- , 1935. A new genus and two new species of Dictynidae (Araneae). Proc. biol. Soc. Wash. 48:45 - 48, 6 figs.
- Bishop, S.C., 1949. Spiders of the Nueltin Lake Expedition, Keewatin, 1947. Can. Ent. 81(4):101 - 104, 13 figs.
- Blackwall, J., 1833. Notice of several recent discoveries in the structure and economy of spiders. Trans. Linn. Soc. Lond. (Zool.) 16:471 - 485, 767 - 770, pl. 31.
- , 1841a. On the number and structure of the mammulae employed by spiders in the process of spinning. Trans. Linn. Soc. Lond. (Zool.) 18:219 - 224.
- , 1841b. The difference in the number of eyes with which spiders are provided proposed as the basis of their distribution into tribes; with descriptions of newly discovered species, on the characters of a new family and three new genera of spiders. Trans. Linn. Soc. Lond. (Zool.) 18:601 - 670.
- , 1846. Notice of spiders captured by Professor Potter in Canada, with descriptions of such species as appear to be new to science. Ann. Mag. nat. Hist. (1)17:30 - 44, 76 - 82.
- , 1861 - 1864. A history of the spiders of Great Britain and Ireland. Ray Society, London. vi + 384 p., 19 pl.
- Blackwelder, R.E., 1967. Taxonomy. A text and reference book. John Wiley and Sons, Inc., New York. xiv + 698 p.
- Bonnet, P., 1955 - 1959. Bibliographia Araneorum. Analyse méthodique de toute la littérature aranéologique jusqu'en 1939. Tome 2(1 - 5):

- 1 - 5058. Les Artisans de l'Imprimerie Douladoure, Toulouse.
- Borrer, D.J., 1960. Dictionary of word roots and combining forms compiled from the Greek, Latin and other languages, with special reference to biological terms and scientific names. N-P Publications, Palo Alto, Calif. v + 134 p.
- Bristowe, W.S., 1938. The classification of spiders. Proc. zool. Soc. Lond., Ser. B, 103(2):285 - 321, 13 figs.
- Bristowe, W.S., 1958. The world of spiders. The New Naturalist. Collins, St. James's Place, London. xiii + 304 p., 116 figs.
- Brown, R.W., 1956. Composition of scientific words. A manual of methods and a lexicon of materials for the practice of logotechnics. Published by the author. Reese Press, Baltimore, Md. 882 p.
- Bryant, E.B., 1940. Cuban spiders in the Museum of Comparative Zoology. Bull. Mus. comp. Zool. Harv. 86(7):249 - 532, 22 pl.
- , 1948. The spiders of Hispaniola. Bull Mus. comp. Zool. Harv. 100(4):331 - 447, 12 pl.
- Chamberlin, R.V., 1916. Results of the Yale Peruvian expedition of 1911. The Arachnida. Bull. Mus. comp. Zool. Harv. 60(6):177 - 299, 25 pl.
- , 1919a. New western spiders. Ann. ent. Soc. Am. 12(3):239 - 260, pl. 14 - 19.
- , 1919b. New California spiders. Pomona Coll. J. Ent. Zool. 12(1):1 - 16, 6 pl. March, 1920. Advance reprint issued August, 1919.
- Chamberlin, R.V., 1920. A new American Amaurobius (Arachnida, Araneina). Ent. News 31(10):293, 1 fig.
- , 1947. A summary of the known North American Amaurobiidae. Bull.

- Univ. Utah biol. Ser. 10(5):1 - 31, 36 figs.
- , 1948. The genera of North American Dictynidae. Bull Univ. Utah biol. Ser. 19(6):1 - 31, 69 figs.
- Chamberlin, R.V., and W. Ivie, 1938. Araneida from Yucatan. Carnegie Inst. Wash. Publ. 491:123 - 136, 24 figs.
- , 1944. Spiders of the Georgia Region of North America. Bull. Univ. Utah biol. Ser. 8(5):1 - 267, 217 figs.
 - , 1947a. The spiders of Alaska. Bull. Univ. Utah biol. Ser. 10(3):1 - 103, 99 figs.
- Chamberlin, R.V., and W. Ivie, 1947b. North American dictynid spiders: the bennetti group of Amaurobius. Ann. ent. Soc. Am. 40(1):29 - 55, 37 figs.
- Chamberlin, R.V., and W.J. Gertsch, 1958. The spider family Dictynidae in America north of Mexico. Bull. Am. Mus. nat. Hist. 116(1):1 - 152, 47 pl.
- Clark, D.J. Letter dated 22nd January, 1969.
- Clark, D.J. Letter dated 6th February, 1969.
- Comstock, J.H., 1910. The palpi of male spiders. Ann. ent. Soc. Am. 3(3):161 - 185, 25 figs.
- , 1912 (1920 ed.). The spider book. A manual for the study of the spiders and their near relatives, the scorpions, pseudoscorpions, whip-scorpions, harvestmen, and other members of the class Arachnida, found in America north of Mexico, with analytical keys for their classification and popular accounts of their habits. Doubleday, Page and Co., Garden City, New York. xv + 721 p., 770 figs.
- Cooke, J.A.L. Letter dated 17th December, 1968.

- Cooke, J.A.L. Letter dated 1st February, 1969.
- Cram, G.F., 1902. Cram's ideal reference atlas of the world with complete 1902 census by counties and town. Geo. F. Cram, Chicago and New York 272 p. (p. 147 - 272 - gazetteer of the United States).
- Crosby, C.R., and S.C. Bishop, 1928. Araneae. In A list of the insects of New York. Cornell Univ. Agric. Exp. Stn. Mem. 101:1034 - 1074.
- Crosby, C.R., and H.M. Zorsch, 1935. Spiders from the Lac St. Jean Region of Québec. Can. Ent. 67(2):38 - 42, 5 figs.
- Dalmas, Comte de., 1917. Araignées de Nouvelle Zélande. Ann. Soc. ent. France. 86:317 - 430, 76 figs.
- Darlington, P.J., Jr., 1957. Zoogeography: the geographical distribution of animals. John Wiley and Sons, Inc., New York. Libr. Congr. Cat. Card No. 57-8882. xi + 675 p., 80 figs.
- Delaney, G.F. Letter dated 19th June, 1970. (G.F. Delaney is the Secretary of the Canadian Permanent Committee on Geographical Names, Ottawa.)
- Delevoryas, T., 1964. The role of paleobotany in vascular plant classification, p. 29 - 36. In Heywood, V.H., and J. McNeill (ed.) Phenetic and phylogenetic classification. A symposium. The Systematics Association, London, 164 p.
- Dice, L.R., 1943. The biotic provinces of North America. Univ. Mich. Press, Ann Arbor. viii + 78, 1 map.
- Dice, L.R., 1952 (1955 ed.). Natural Communities. Univ. Michigan Press, Ann Arbor. x + 547 p., 51 figs.
- Dobzhansky, Th., 1941. Genetics and origin of species. 2nd ed. Columbia Univ. Press, New York. 446 p.

- Dondale, C.D., 1964. Sexual behavior and its application to a species problem in the spider genus Philodromus (Araneae:Thomisidae). Can. J. Zool. 42:817 - 827, 11 figs.
- , 1966. The spider fauna (Araneida) of deciduous orchards in the Australian Capital Territory. Aust. J. Zool. 14:1157 - 1192, 9 figs.
- Dondale, C.D., and J.H. Redner, 1968. The imbecillus and rufus groups of the spider genus Philodromus in North America (Araneida:Thomisidae). Mem. ent. Soc. Can. 55:1 - 78, 224 figs.
- Emerton, J.H., 1888. New England spiders of the family Ciniflonidae. Trans. Conn. Acad. Arts Sci. 7:443 - 458, pl. 9 - 11.
- , 1909. Supplement to the New England spiders. Trans Conn. Acad. Arts Sci. 14:171 - 236, 12 pl.
- Emerton, J.H., 1918. Spiders collected in Nova Scotia and New Brunswick by Robt. Matheson, in 1912. Proc. ent. Soc. Nova Scotia 3:95 - 96.
- , 1919. New spiders from Canada and the adjoining states, No. 2. Can. Ent. 51(5):105, 108, 16 figs.
- , 1920. Catalogue of the spiders of Canada known to the year 1919. Trans. R. Can. Inst. 12(2):309 - 338.
- , 1928. Spiders from the Lake Abitibi Region. Univ. Toronto Stud. biol. Ser. 32:45 - 46.
- Exline, H., 1960. Rhoicinine spiders (Pisauridae) of western South America. Proc. Calif. Acad. Sci. 3rd Ser., 29(17):557 - 620, 1 map, 5 pl.
- Fitzpatrick, L.L., 1925. Nebraska place names. Univ. Nebraska Stud. Lang. Lit. Crit. 6:1 - 166.
- Forster, R.R. Letter dated 11th May, 1970.
- Forster, R.R. Letter dated 4th August, 1970.

Forster, R.R. Letter dated 21st September, 1970.

Forster, R.R., 1970. The spiders of New Zealand. Part 3. Desidae, Dictynidae, Hahniidae, Amaurobioididae, Nicodamidae. Otago Mus. Bull. 3:1 - 184, 534 figs.

Freitag, R., G.W. Ozburn, and R.E. Leech, 1969. The effects of sumithion and phosphamidon on populations of five carabid beetles and the spider Trochosa terricola in northwestern Ontario and including a list of collected species of carabid beetles and spiders. Can. Ent. 101(12):1328 - 1333, 2 figs.

Gazetteer of Canada Series, and Supplements.

Southwestern Ontario, 1952.

British Columbia, 1953, revised 1966.

Manitoba, 1956, revised 1968.

New Brunswick, 1956, reprinted 1964.

Saskatchewan, 1957.

Alberta, 1958, reprinted 1965.

Yukon and Northwest Territories (provisional), 1958.

Prince Edward Island, 1960, reprinted 1964, 1965.

Nova Scotia, 1961.

Ontario, 1962.

Québec (in preparation).

Supplements to the Gazetteer of Canada are issued semi-annually, starting January - June, 1963. Canadian Permanent Committee on Geographical Names. Queen's Printer, Ottawa.

Gazetteer of Utah Localities and Altitudes, 1952. Division of Biology,

University of Utah, Salt Lake City. 216 p.

- Gering, R.L., 1953. Structure and function of the genitalia in some American agelenid spiders. *Smithson. misc. Collns.* 121(4):1 - 84, 72 figs.
- Gerschman de Pikelin, B.S., and R.D. Schiapelli. Letter dated 22nd April, 1969.
- Gertsch, W.J., 1937. New American spiders. *Am. Mus. Novit.* 936:1 - 17, 7 figs.
- , 1949. American spiders. *The Illustrated New Naturalist*. D. Van Nostrand Co., Inc., Princeton, New Jersey. xiii + 285 p., 6 text figs., 32 pl.
- Gertsch, W.J., and W.L. Jellison, 1939. Notes on a collection of spiders from Montana. *Am. Mus. Novit.* 1032:1 - 13.
- Gertsch, W.J., and L.I. Davis, 1940. Report on a collection of spiders from Mexico. II. *Am. Mus. Novit.* 1059:1 - 18, 30 figs.
- Giltay, L., 1926. Remarques sur la classification et la phylogeny des familles d'araignées. *Ann. Bull. Soc. ent. Belg.* 66:115 - 131, 1 fig.
- Goeldi, E.A., 1892. Zur Orientierung in der Spinnenfauna Brasiliens. *Mitt. Osterlande (N.F.)* 5:200 - 248.
- Granger, B.H., 1960. Arizona place names. Univ. Arizona Press, Tucson. xix + 519 p.
- Gudde, E.G., 1969. California place names. The origin and etymology of current geographical names. 3rd ed. Univ. Calif. Press, Berkeley and Los Angeles. xxi + 416 p.
- Hackman, W., 1954. The spiders of Newfoundland. *Acta zool. fenn.* 79:1 - 99, 121 figs., 5 maps.

- Hagmeier, E.M., 1966. A numerical analysis of the distribution of North American mammals. II. Re-evaluation of the provinces. *Syst. Zool.* 15 (4):279 - 299, 5 figs.
- Henderson, I.F., and W.D. Henderson, 1963. A dictionary of biological terms. Oliver and Boyd, Edinburgh. (8th edition by J.H. Kenneth). xvi + 640 p.
- Holmberg, E.L., 1876. Aracnidos Argentinos. *An. Agric. Repub. Argent.* 4:15 - 16, 16 - 17, 23 - 25, 33 - 34, 47, 72, 79 - 80, 95, 112 - 113, 143, 160 - 161, 167 - 168, 176, 184 - 185, 193 - 194, 198, 16 figs. (Separate, 30 p.).
- Hopkins, D.M., 1967. The Cenozoic history of Beringia - a synthesis, p. 451 - 484, 4 figs. In Hopkins, D.M. (ed.), *The Bering land bridge*. Stanford Univ. Press, Stanford.
- Holt, P.C., R.L. Hoffman, and C.W. Hart, Jr., (editors), 1969. The distributional history of the biota of the southern Appalachians. Part I: Invertebrates. *Res. Div. Monogr. 1*, Virginia Polytech. Inst. vi + 295 p., many figs.
- Hubert, M., 1966. Remarques sur quelques espèces d'araignées appartenant au genre Titanoeca Thorell, 1870. *Bull. Mus. natn. Hist. nat., Paris*, 2nd Ser., 38(3):238 - 246, 9 figs.
- Hull, J.E., 1920. The spider family Linyphiidae: an essay in taxonomy. *Vasculum* 6:7 - 11.
- Ivie, W. Letter dated 3rd March, 1969.
- Ivie, W. Letter dated 17th June, 1969.
- Jones, S., 1970. Washington state fishing guide. 3rd ed., April, 1970. Edited and published by the author. Seattle, Washington. 288 p.

- Kaston, B.J., 1948. The spiders of Connecticut. St. Geol. Nat. Hist. Surv. Bull. 70. Conn. Publ. Docum. 47. 874 p., 144 pl.
- , 1955. Checklist of Illinois spiders. Trans. Ill. St. Acad. Sci. 47:165 - 172.
- Kaston, B.J., and E. Kaston, 1952. How to know the spiders. Wm. C. Brown Co., Publishers, Dubuque, Iowa. vi + 220, 552 figs.
- Keyserling, E., 1878. Spinnen aus Uruguay and einigen anderen Gegenden Amerikas. Verh. zool. -bot. Ges. Wien 27:571 - 624, pl. 14.
- , 1891. Die Spinnen Amerikas. Brasilianische Spinnen. Nürnberg, 1891, 3:1 - 278, 10 pl. (This part was published by G. Marx after the death of E. Keyserling.)
- Kishida, K., 1930. A new scheme of classification of spider families and genera. Lansania 2(13):34 - 43.
- Koch, C.L., 1837. Übersicht des Arachnidensystems. Heft 1. Nürnberg. 39 p., 6 pl.
- , 1839. Die Arachniden. Sechster Band. Nürnberg. 1839, 156 p., pl. 181 - 216.
- Koch, L., 1868. Die Arachnidengattungen Amaurobius, Caelotes und Cybaeus. Abh. naturhist. Ges. Nürnberg, 1868, 52 p., 2 pl.
- , 1872. Die Arachniden Australiens, nach der Natur beschrieben und abgebildet. Nürnberg, 1872:105 - 368.
- Kramer, F.L., 1951 - 1952. Idaho town names. Twenty-third Biennial Report. Idaho St. Hist. Dep. p. 15 - 114.
- Kurata, T.B., 1943. The Spiders of the Lake Nipissing and Lake Temagami Regions, Ontario. Can. Field. Nat. 57:9 - 13.
- Landes, H., 1917. A geographic dictionary of Washington. Bull. Wash. geol. Surv. 17:5 - 349.

Latreille, P.A., 1806. Genera Crustaceorum et Insectorum. I. Paris.

127 p., 5 pl.

Leech, H.B., 1947. A few records of spiders from British Columbia and

Alberta. Proc. ent. Soc. Br. Columb. (1946) 43:22.

Leech, R., 1971 (in press). The introduced Amaurobiidae of North

America, and Callobius hokkaido, n. sp., from Japan (Arachnida:

Araneida). Can. Ent. 103.

Lehtinen, P.T., 1964. Additions to the spider fauna of southern and

central Finland. Ann. zool. fenn. 1:303 - 305, 1 fig.

- , 1967. Classification of the cribellate spiders and some allied families, with notes on the evolution of the suborder Araneomorpha.

Ann. zool. fenn. 4:199 - 468, 524 figs.

Levi. H.W., 1961. Evolutionary trends in the development of palpal sclerites in the spider family Theridiidae. J. Morph. 108:1 - 9.

- , 1965. Techniques for the study of spider genitalia. Psyche, Camb., 72:152 - 158, 5 figs.

- , 1967. Adaptations of respiratory systems of spiders. Evolution 21(3):571 - 583, 12 figs.

Levi. H.W., and L.R. Levi, 1951. Report on a collection of spiders and

harvestmen from Wyoming and neighboring states. Zoologica, N.Y.,

36(4):219 - 237, 50 figs.

Levi, H.W., L.R. Levi, and J.L. Kaspar, 1958. Harvestmen and spiders of

Wisconsin: additional species and notes. Trans. Wisc. Acad. Sci.

Arts Lett. 47:43 - 52.

Levi, H.W., and O. Kraus, 1964. Amaurobius C.L. Koch, 1837 and Coelotes

Blackwall, 1841, (Arachnida, Araneae): proposed preservation under

the Plenary Powers. Z.N.(S.) 1625. Bull. zool. Nom. 21(2):150 -

153.

Levi, L.R., and H.W. Levi, 1955. Spiders and harvestmen from Waterton and Glacier National Parks. *Can. Field Nat.* 69:32 - 40, 2 pl.

Lindroth, C.H., 1957. The faunal connections between Europe and North America. Almqvist and Wiksell, Stockholm, and John Wiley and Sons., Inc., New York. 344 p., 61 figs.

- , 1963a. The fauna history of Newfoundland illustrated by carabid beetles. *Opusc. ent.*, (Suppl. 23), 112 p., 96 figs.

Lindroth, C.H., 1963b. The Aleutian Islands as a route for dispersal across the north Pacific, p. 121 - 131, 6 figs. In Gressitt, J.L. (ed.), Pacific Basin biogeography, a symposium. Tenth Pacific Science Congress, Honolulu, Hawaii, 1961. Bishop Museum Press.

Lindroth, C.H., and G.E. Ball, 1969. An annotated list of Invertebrates of the Kodiak Island refugium, p. 122 - 155, 1 fig. In Karlstrom, T.N.V., and G.E. Ball (editors), The Kodiak Island refugium. Boreal Institute, University of Alberta. Ryerson Press, Toronto.

Linsley, E.G., 1958. Geographical origins and phylogenetic affinities of the cerambycid beetle fauna of western North America, p. 299 - 320, 2 figs. In Hubbs, C.L., (editor), Zoogeography. Am. Assoc. Adv. Sci. Publ. 51.

Linsley, E.G., 1963. Bering arc relationships of Cerambycidae and their host plants, p. 159 - 178. In Gressitt, J.L. (ed.), Pacific Basin biogeography, a symposium. Tenth Pacific Science Congress, Honolulu, Hawaii, 1961. Bishop Museum Press.

Lloyd, J.J., 1963. Tectonic history of the south Central-American orogen, p. 88 - 100, 12 figs. In Childs, O.E., and Beebe, W.B. (ed.), Backbone of the Americas, a symposium. Mem. Am. Assoc.

- Petrol. Geol. 2, Tulsa Oklahoma.
- Locket, G.H., and A.F. Millidge, 1951. British Spiders. Vol. 1. Ray Society. ix + 310 p., 142 figs.
- Lowrie, D.C., and W.J. Gertsch, 1955. A list of the spiders of the Grand Teton Park area, with descriptions of some new North American spiders. Am. Mus. Novit. 1736:1 - 29, 32 figs.
- Marples, B.J., 1962. The Matachiinae, a group of cribellate spiders. J. Linn. Soc. Lond. (Zool.) 44(301):701 - 720, 6 figs.
- , 1968. The hypochilomorph spiders. Proc. Linn. Soc. Lond. 179(1): 11 - 31, 7 figs.
- Marples, R.R., 1959. The dictynid spiders of New Zealand. Trans. R. Soc. N.Z. 87(3 and 4):333 - 361, 3 text figs.
- Marx, G., 1890. Catalogue of the described Araneae of temperate North America. Proc. U.S. natn. Mus. 12:497 - 594.
- Mayr, E., 1969. Principles of systematic zoology. McGraw-Hill Book Co., New York. Libr. Congr. Cat. Card No. 68-54937. xi + 428 p., many figs.
- McAlpine, J.F., and J.E.H. Martin, 1969. Canadian amber - a paleontological treasure-chest. Can. Ent. 101(8):819 - 838, 17 figs.
- McArthur, L.A., 1965. Oregon geographical names. 3rd ed. Binfords and Mort, Publishers, Portland. Oregon Hist. Soc., p. xvi + 686.
- Mello-Leitão, C.F. de, 1915. Alguns generos e especies novas de araneidos do Brasil. Broteria 13(3):129 - 142.
- , 1921. Um genero e quatro especies novas de aranhas do Brasil. Revta Sci. 4:179 - 180.
- , 1931. Notas sobre arachnideos argentinos. Anais Acad. bras. Cienc. 3:83 - 97, 5 figs.

- Mello-Leitão, C.F. de, 1933. Catalogo das aranhas Argentinas. Archos. Esc. sup. Agric. med. vet. Nictheroy 10(1):3 - 63.
- , 1941. Las arañas de Córdoba, La Rioja, Catamarca, Tucumán Salta y Jujuy. Revta Mus. La Plata, (N.S.), 2:99 - 198, 59 figs.
 - , 1943. Arañas neuvas de Mendoza, La Rioja, y Córdoba. Revta Mus. La Plata, (N.S.), 3:101 - 121, 22 figs.
- Montgomery, T.H., Jr., 1909. On the spinnerets, cribellum, colulus, tracheae and lung-books of araneads. Proc. Acad. nat. Sci. Philad. 61:299 - 320, 4 pl.
- Mulaik, S.D. Letter dated about 7th August, 1969.
- Muma, M.H., 1943. Common spiders of Maryland. Md nat. Hist. Soc., Baltimore. 173 p., 14 pl.
- Nicolet, H., 1849. Aracnidos. In Gay, C., Historia física y política de Chile. Zoologia, III, p. 319 - 543.
- Pearce, T.M., 1965. New Mexico place names. A geographical dictionary. Univ. New Mexico Press, Albuquerque. xv + 187 p.
- Peters, R., 1967. Vergleichende Untersuchung über Bau und Funktion der Spinnwarzen und Spinnwarzenmuskulatur einiger Araneen. Zool. Beitr., (N.F.), 13(1):1 - 119, 41 figs.
- Petrunkévitch, A., 1911. A synonymic index-catalogue of spiders of North, Central and South America with all adjacent islands, Greenland, Bermuda, West Indies, Terra del Fuego, Galapagos, etc. Bull. Am. Mus. nat. Hist. 29:v + 791.
- , 1923. On families of spiders. Ann. N.Y. Acad. Sci. 29:145 - 180, 2 pl.
 - , 1928. Systema Araneorum. Trans. Conn. Acad. Arts Sci. 29:1 - 270.
 - , 1933. An inquiry into the natural classification of spiders,

- based on a study of their internal anatomy. Trans. Conn. Acad. Arts Sci. 31:299 - 389.
- , 1942. A study of amber spiders. Trans. Conn. Acad. Arts Sci. 34:119 - 464, 69 pl.
- , 1949. A study of Paleozoic arachnida. Trans. Conn. Acad. Arts Sci. 37:69 - 315, 83 pl.
- Petrunkévitch, A., 1958. Amber spiders in European collections. Trans. Conn. Acad. Arts Sci. 41:97 - 400, 591 figs.
- Petrunkévitch, A., 1963. Chiapas amber spiders. Univ. Calif. Publs Ent. 31(1):1 - 40, 131 text figs., pl. 1 - 2.
- Petrunkévitch, A., and Collaborators, 1939. Catalogue of American spiders. Part I. Trans. Conn. Acad. Arts Sci. 33:133 - 338.
- Pickard-Cambridge, F.O., 1897 - 1905. Arachnida-Araneidea and Opiliones, 2. In Biologia cent.-am., Zool., ix + 610 p., 54 pl.
- Pickard-Cambridge, O., 1889 - 1902. Arachnida-Araneidea, 1. In Biologia cent.-am., Zool., 317 p., 39 pl.
- Pocock, R.I., 1895. Description of two new spiders obtained by Messrs. J.J. Quelch, and F. MacConnell on the summit of Mount Roraima, in Demerara; with a note upon the systematic position of the genus Desis. Ann. Mag. nat. Hist. (6)16:139 - 143.
- Renault, T.R., 1968 (not published). An illustrated key to the arboreal spiders (Araneida) in the fir-spruce forests of New Brunswick. Forestry Research Laboratory, Fredericton, New Brunswick. Internal Report M-39. v + 26 p., 117 figs.
- Roewer, C. Fr., 1928. Aráneae, Echte oder Webespinnen. In Die Tierwelt Mitteleuropas. Leipzig. 144 p., 1586 figs.
- , 1954. Katalog der Araneae. II(b):927 - 1751. Inst. r. Sci. nat.

Belg., Bruxelles.

- Savage, J.M., 1966. The origins and history of the Central American herpetofauna. *Copeia*, 1966, (4):719 - 765, 26 figs.
- Schick, R.X., 1965. The crab spiders of California (Araneida, Thomisidae). *Bull. Am. Mus. nat. Hist.* 129:1 - 179, 262 figs., 40 maps.
- Shear, W.A., 1967. Expanding the palpi of male spiders. *Breviora* 259:1 - 27, 51 figs.
- Simon, E., 1864. Histoire naturelle des araignées (Aranéides). *Libr. Encyc. de Roret*, Paris. 540 p., 208 figs.
- , 1884. Note sur les Amaurobius de l'Amerique du Nord. *Bull. Soc. ent. France* 9:318 - 320, 3 figs.
 - , 1892 - 1903. Histoire naturelle des araignées. Tomes I and II. 2nd ed. *Libr. Encyc. de Roret*, Paris. vii + 1084 p., 1098 figs; and 1080 p., 1122 figs.
 - , 1893. Voyage de M.E. Simon au Venezuela (Decembre 1887 - Avril 1888). *Mem.* 21(1). *Ann. Soc. ent. France* 61:423 - 462, pl. 9.
 - , 1899. Ergebnisse einer Reise nach dem Pacific (Schauinsland 1896 - 1897). *Arachnoideen. Zool. Jb., (Syst.)*, 12:411 - 437.
 - , 1904. Étude sur les arachnides du Chili recueillis en 1900, 1901 et 1902, par MM. C. Porter, Dr. Delfin, Barcey Wilson et Edwards. *Ann. Soc. ent. Belg.* 48:83 - 114, 8 figs.
 - , 1911. Catalogue raisonné des arachnides du Nord de l'Afrique (Part 1). *Ann. Soc. ent. France* 79:265 - 332, 13 figs.
- Ström, H., 1768. Beskrivelse over Norske Insekter, andet Stekke. *K. norske Vidensk. Selsk. Skr.* 4:313 - 371 (spiders 362 - 363).
- Thorell, T., 1869 - 1870. On European spiders. Part I. Review of the European genera of spiders, preceded by some observations on

- zoological nomenclature. Nova Acta R. Soc. Scient. upsal.
(3):1 - 242, 1 pl.
- , 1890. Studi sui ragni Malesi e Papuani. Part IV, 1. Annali
Mus. civ. Stor. nat. Giacomo Doria (2)8:1 - 419.
- Thorn, E., 1967. Preliminary distributional list of the spiders of
British Columbia. Rep. prov. Mus. nat. Hist. Anthrop. Br. Columb.
1966 (1967):23 - 39. (Separate p. 1 - 17.)
- Tullgren, A., 1901. Contributions to the knowledge of the spider fauna
of the Magellan Territories. Svenska Expeditionen till
Magellansl nderna 2(10):181 - 263, pl. 15 - 19.
- , 1905. Araneida from the Swedish expedition through the Gran
Chaco and the Cordilleras. Ark. Zool. 2(19):1 - 81, 10 pl.
- Turnbull, A.L., 1952 (MS, unpublished). A list of British Columbia
spiders. 68 p.
- Turnbull, A.L., C.D. Dondale, and J.H. Redner, 1965. The Spider genus
Xysticus C.L. Koch (Araneae:Thomisidae) in Canada. Can. Ent.
97(12):1233 - 1280, 179 figs.
- Udvardy, M.D.F., 1969. Dynamic zoogeography with special reference
to land animals. Van Nostrand Reinhold Co., New York. Libr.
Congr. Cat. Card No. 70-81357. xviii + 445 p., illust.
- Van Dyke, E.C., 1919. The distribution of insects in western North
America. Ann. ent. Soc. Am. 12(1):1 - 12, 1 fig.
- , 1933. Peculiarities of the coleopterous fauna of semiarid
southwestern North America. Fifth Int. Congr. Ent., Paris, 1932.
p. 471 - 477.
- , 1940. The origin and distribution of the coleopterous insect
fauna of North America. Proc. Sixth Pac. Sci. Congr. 4:255 - 268,

- 1 map. (publ. Univ. Calif. Press).
- Vogel, B.R., 1967. A list of new North American spiders 1940 - 1966.
Mem. Am. ent. Soc. 23:1 - 186.
- *Walckenaer, C.A., 1802. Faune parisienne. Insects. ou histoire
abrégée des insectes des environs de Paris. Paris, 1802, 2 vols.
(spiders, 2:187 - 250).
- *- , 1830. Araneides. In Faune française ou histoire naturelle
générale et particulière des animaux que se trouvent en France,
constamment ou passagèrement, à la surface du sol, dans les eaux que
le baignent et dans le littoral des mers que le bornent par Viellot,
Desmaray, Ducrotoy, Audinet, Lepelletier et Walckenaer. Paris.
Part 27:97 - 175.
- , 1837. Histoire naturelle des insectes. Aptères. Tome I. Paris.
vi + 682 p.
- Wiehle, H., 1953. Spinnentiere oder Arachnoidea (Araneae). IX.
Orthognatha - Cribellatae - Haplogynae - Entelegynae. Die Tierwelt
Deutschlands 42:1 - 150, 305 figs.
- Woods, R.S., 1966. An English-Classical dictionary for the use of
taxonomists. Pomona College. Libr. Congr. Cat. Card No. 66-28122.
xiii + 331 p.

GLOSSARY

The definitions of names for spider parts have been given in Comstock (1910), Gertsch (1949), Kaston (1948), Kaston and Kaston (1952), Henderson and Henderson (1963), Lehtinen (1967), and Locket and Millidge (1951). There are, however, still some confusing usages of terms.

After careful examination and/or dissection, I have come to disagree with several authors and their definitions of certain structures (e.g., calamistrum).

Apophysis:- in spider taxonomy and morphology, a fixed or movable process. Within the palpal organ, the apophyses are movable, but on the palpal tibia, the apophyses are fixed. See process.

Bristle:- a cuticular appendage, usually long and thin and much more slender than a spine. Movement of a bristle is exogenous.

Bursa Copulatrix:- the sclerotized part of the epigynum containing the copulation tube.

Calamistrum:- a single-rowed series of curved, slightly thickened hairs on the dorso-retrolateral margin of Metatarsus IV used to comb the so-called hackle-band threads that issue from the cribellum. This name was given by Blackwall (1841a). Some authors state (e.g., Kaston, 1948:552) that there are sometimes two rows of curved hairs, but this is not correct, as what is considered to be the second row is but several to many short, closely-appressed body hairs (called the pseudocalamistrum by Lehtinen, 1967:339, a term previously used by Mello-Leitão^N, 1915:130, for a row of patellar hairs).

Carpoblem:- a tibial process of the palpus. If there is more than one process present, then this term refers to the larger process. This term was introduced by Hull (1920:9), but does not seem to have gained common usage anywhere.

Claw Tuft:- the bunches of hairs at the tips of the tarsi in some spiders with two tarsal claws (not to be confused with leg scopulae).

Colulus:- a single appendage or pair of appendages (coluli) of some spiders resembling a small spinneret and positioned immediately anterior to the spinnerets. Coluli are considered to be the vestiges of the anterior median spinnerets (Montgomery, 1909:304; Peters, 1967:103) and the homologue of the cribellum.

Copulation tube:- the tube in the bursa copulatrix in which the embolus is inserted during copulation. It begins on the exterior of the epigynum and terminates at the spermatheca.

Cribellate:- referring to a spider possessing a cribellum and calamistrum, though the latter is so reduced in some male cribellates as to be nonfunctional.

Cribellum:- vestigial anterior median spinnerets that spin a flocculent, sticky silk. This name was designated by Koch (1868:3).

Dorsal Process:- the palpal tibial process on the morphologically dorsal side of the tibia (see Fig. 10).

Ecribellate:- referring to a spider lacking a cribellum and calamistrum.

Ectal Process:- the ectal process is the palpal process on the morphologically posterior side of the palpus (see Fig. 10).

Epigynum:- a sclerite on some female spiders containing the tubes through which during copulation the sperm are passed in the bursa copulatrix to the spermathecae.

Inferior Claw:- same as median claw. It is unpaired.

Leg Length Index:- relative lengths of the legs to one another. The scale is from longest to shortest.

Median Apophysis:- an appendage arising from the middle division of the palpal organ in male spiders. Its functions are to increase both the strength and rigidity of the tegulum, protect the seminal receptacle, and help lock the bulb during maximum insertion of the embolus into the copulation tube.

Median Ocular Area:- same as median ocular quadrangle of some authors, and abbreviated to MOA. Same as MOT (median ocular trapesium) of Lehtinen (1967:295).

Mesal Process:- the palpal tibial process on the morphologically anterior side of the tibia (see Fig. 10).

Primary Spiral:- in some spider genera (e.g., Titanoeca), the copulation tube is shaped like a double set of intertwining spirals between its beginning on the exterior of the epigynum and its terminus at the spermatheca. The first set of loops courses anteriorly, and this I call the primary spiral. The second set of loops courses posteriorly, and this I call the secondary spiral.

Process:- a fixed prolongation of the surface of an appendage. I suggest that the term "apophysis" be restricted to those parts within the male palpal organ, and that the term "process" refer only to the fixed prolongations as found on the palpi from the tibia to the coxa and on any segment of a walking leg. On the palpal tibia of members of the genus Callobius there are three processes visible when the palpus is examined from above (see Fig. 10).

Pseudocalamistrum:- sensu Lehtinen (1967:339), a subbasal oval area of short, closely-appressed body hairs on the dorsal surface of Metatarsus IV of cribellate spiders. Sensu Mello-Leitão (1915:130), a row of patellar hairs. See also calamistrum.

Secondary Spiral:- see primary spiral.

Seta:- a cuticular appendage; a macrotrichium; a hairlike process, and in spiders are located on the prosoma and opisthosoma. They do not articulate except by exogenous pressure, such as contact with another object. Setae originate in a cuplike pits.

Spine:- a cuticular appendage. The word "spine" has had common usage in spider classification and morphology for years, and it refers most usually to those limb appendages that articulate at their bases by endogenous pressure, such as that caused by blood pressure differences at peaks of excitation. Spines move in one plane only. Schick (1965:10) introduced the word "spiniform" as a noun for "spine", and this was followed by Turnbull, Dondale and Redner (1965:1234), but Dondale and Redner (1968:6) changed to the word "macroseta", which seems to be another new term.

Spur:- usage of this word in spider taxonomy and morphology restricts the meaning of this word to synonymy with apophysis, except that the term "apophysis" is used for structures within the male palpal organ. See process.

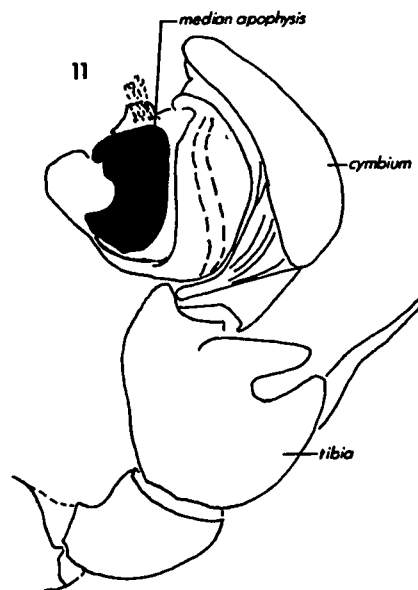
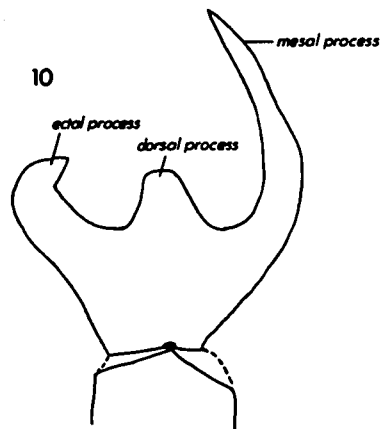
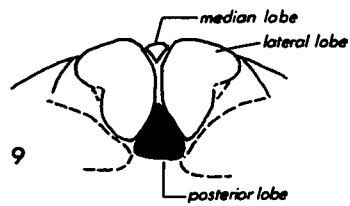
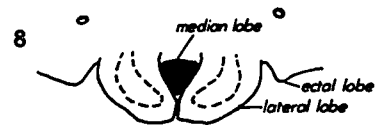
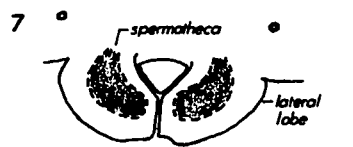
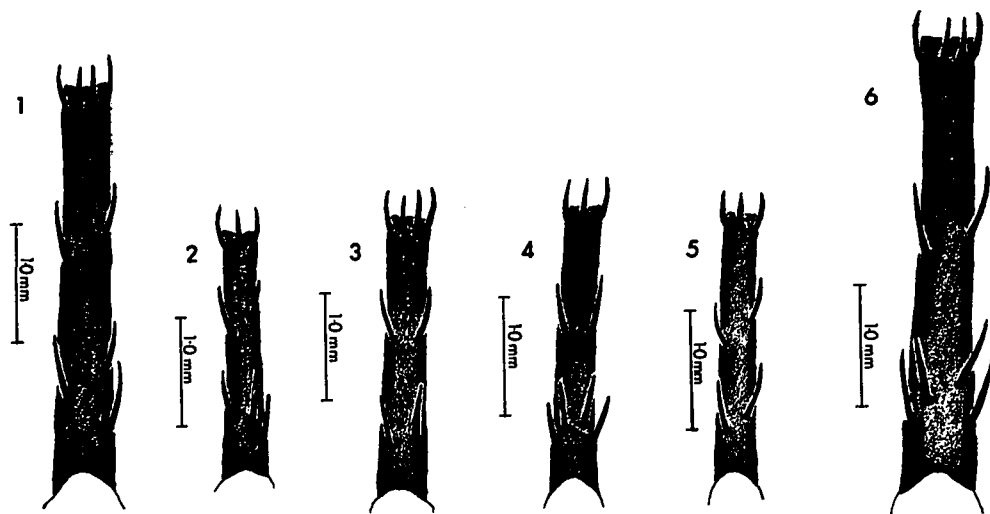
Terminal Apophysis:- a strongly sclerotized structure in the embolic division of the male palpal organ of some spiders.

Tibial Apophysis:- a tubercular or elongate, fixed, process arising from the wall of the tibia. See process.

Trichobothrium:- a very fine seta of essentially uniform thickness throughout its length. Trichobothria are variable in length and arise from a hemispherical socket and extend out at right angles from the surface of the leg segment. Trichobothria are sensitive to air currents and vibrations. Roewer (1928:3) correctly indicated that the name of these setae should be bothriotrichium rather than trichobothrium, as it is the socket that is the trichobothrium, not the seta (trichos = hair; bothros = pit). However, overwhelming usage dictates that the term trichobothrium remain.

Figs 1 - 11.

1 - 6. Ventral view of Metatarsus I of several species of the genus Callobius showing different combinations of spines. 7 - 9. Views of epigyna of the genus Callobius showing the diagnostic features. 10. Dorsal view of left palpal tibia of Callobius bennetti showing the names of the tibial processes. 11. Ectal view of left palpus of Callobius bennetti showing the position of the median apophysis as it is found in members of the genus Callobius.



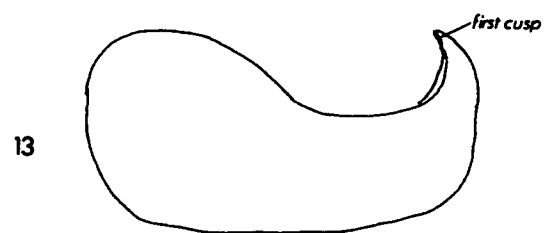
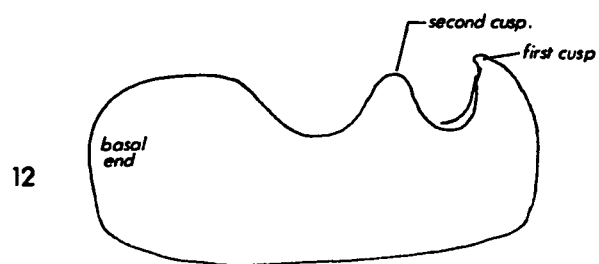
Figs. 12 - 14a.

12. Diagrammatic drawing of median apophysis of genus Callobius showing large first and second cusps with a deep notch between them.

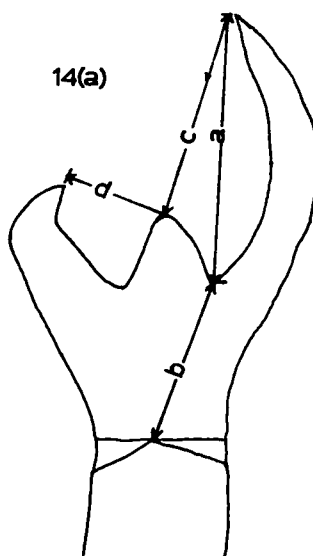
13. Diagrammatic drawing of median apophysis of genus Callobius

showing a single cusp only. 14. Diagrammatic drawing of median apophysis of genus Callobius showing small first and second cusps and a shallow notch between them. 14a. Diagrammatic dorsal view of left

palpal tibia of male Callobius species indicating locations of points from which measurements are taken for proportion ratios. Line "a" is distance from tip of mesal process to bottom of notch between dorsal and mesal processes. Line "b" is distance from bottom of notch between dorsal and mesal processes to articulation point at base of tibia. Line "c" is distance from tip of mesal process to tip of dorsal process. Line "d" is distance from tip of dorsal process to tip of ectal process.

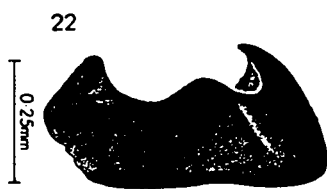
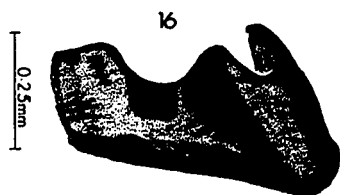
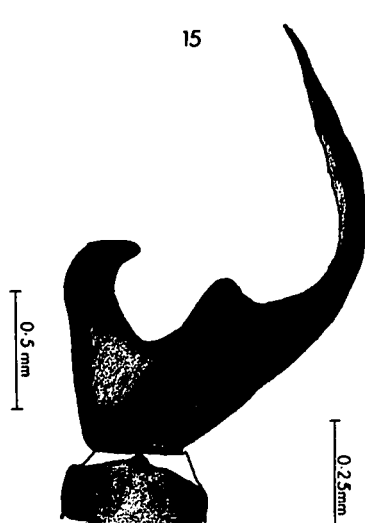


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Figs. 15 - 23.

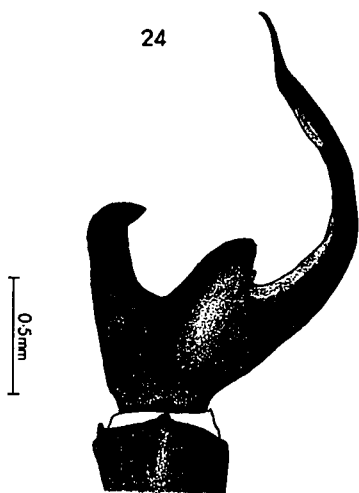
15. Dorsal view of left palpal tibia of Callobius angelus. 16. Full view of left median apophysis of C. angelus. 17. Slightly dorsolateral view of palpal tibia of C. angelus showing how dorsal process appears to be on base of mesal process. 18. Lateral or ectal view of left palpal organ of C. angelus showing position of median apophysis in palpal organ. 19. Dorsal view of left palpal tibia of Callobius manzanita. 20. Dorso-anteromesal view of left palpal tibia of C. manzanita showing small secondary subprocess ventral to dorsal process, and between dorsal process and attachment place to cymbium (secondary subprocess darkened). 21. Ectal view of left palpal tibia of C. manzanita showing subprocess behind dorsal process. 22. Full view of left median apophysis of C. manzanita. 23. Lateroventral view of left median apophysis of C. manzanita.



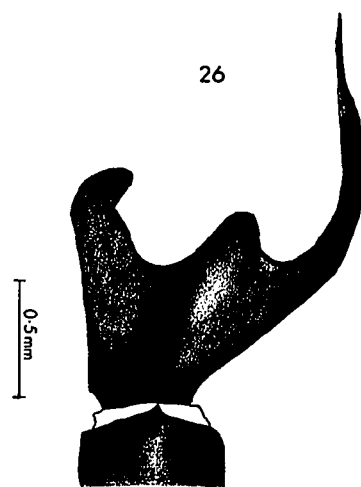
Figs. 24 - 32.

24. Dorsal view of left palpal tibia of Callobius panther. 25. Full view of left median apophysis of C. panther. 26. Dorsal view of left palpal tibia of Callobius paskenta. 27. Full view of left median apophysis of C. paskenta. 28. Dorsal view of left palpal tibia of Callobius paynei. 29. Full view of left median apophysis of C. paynei. 30. Dorsal view of left palpal tibia of Callobius arizonicus from Chiricahua Mountains, Arizona. 31. Dorsal view of left palpal tibia of C. arizonicus from Chiricahua Mountains, Arizona. 32. Full view of left median apophysis of C. arizonicus.

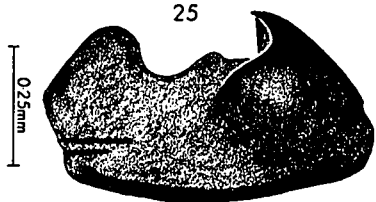
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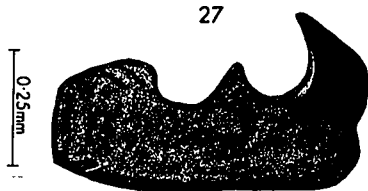
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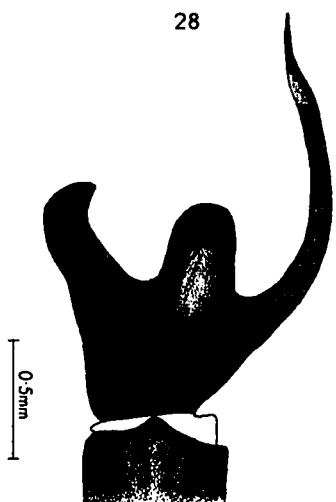
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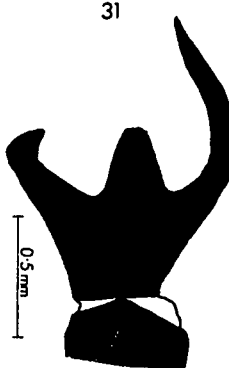
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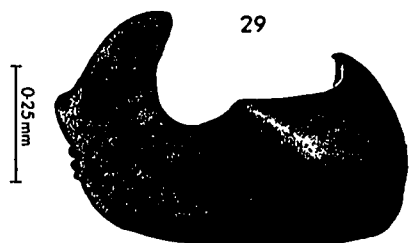
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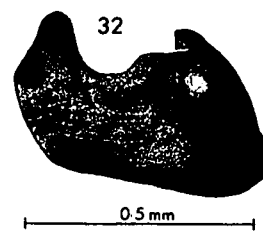
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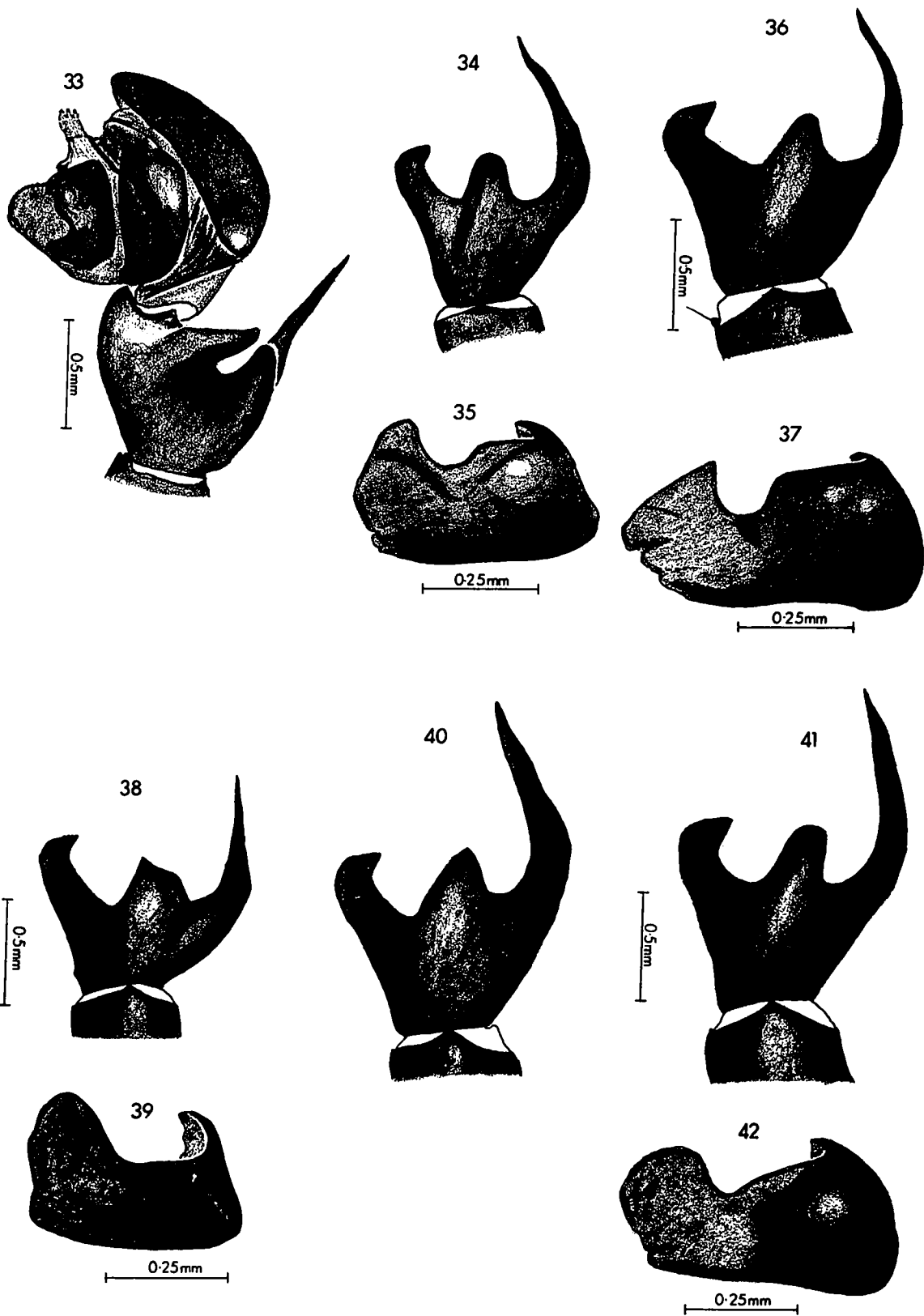


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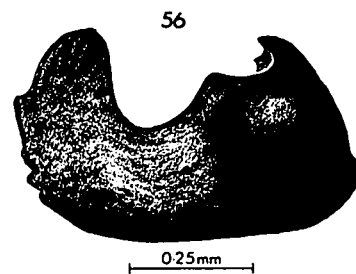
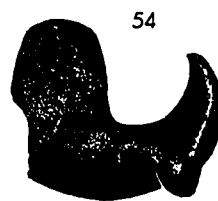
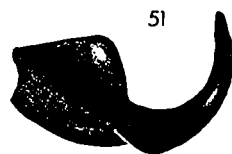
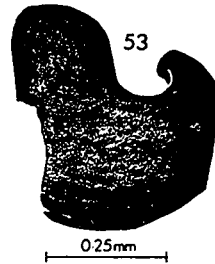
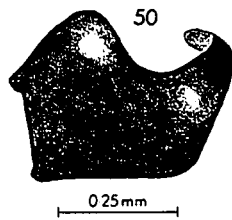
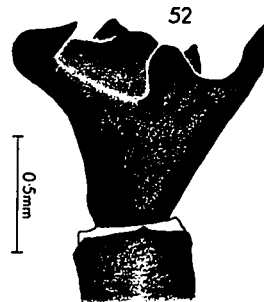
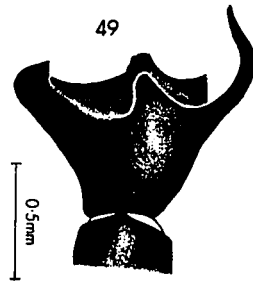
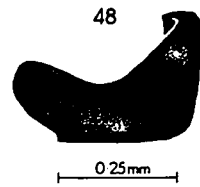
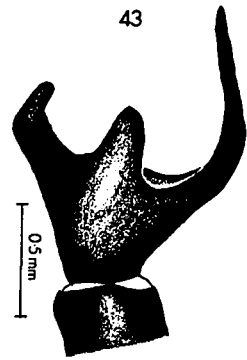
Figs. 33 - 42.

33. Ectal view of left palpal organ of Callobius bennetti. 34. Dorsal view of left palpal tibia of C. bennetti. 35. Full view of left median apophysis of C. bennetti. 36. Dorsal view of left palpal tibia of Callobius canada. 37. Full view of left median apophysis of C. canada. 38. Dorsal view of left palpal tibia of Callobius deces. 39. Full view of left median apophysis of C. deces. 40. Dorsal view of left palpal tibia of Callobius enus from Cedar Lake, Washington. 41. Dorsal view of left palpal tibia of C. enus from near McCall, Idaho. 42. Full view of left median apophysis of C. enus from near McCall, Idaho.



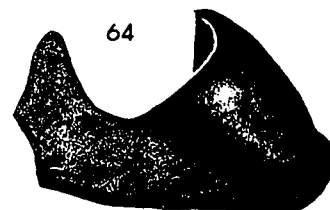
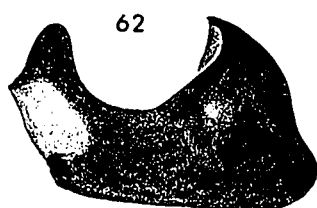
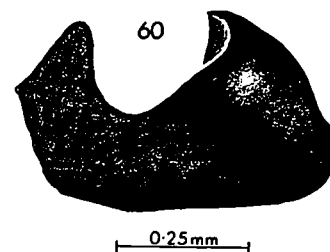
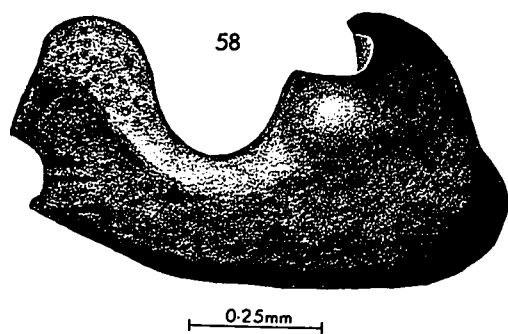
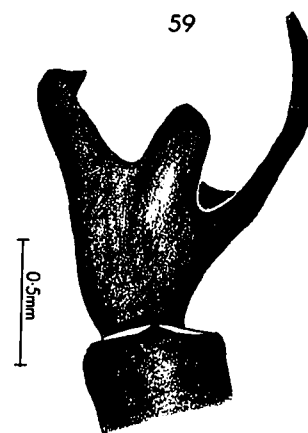
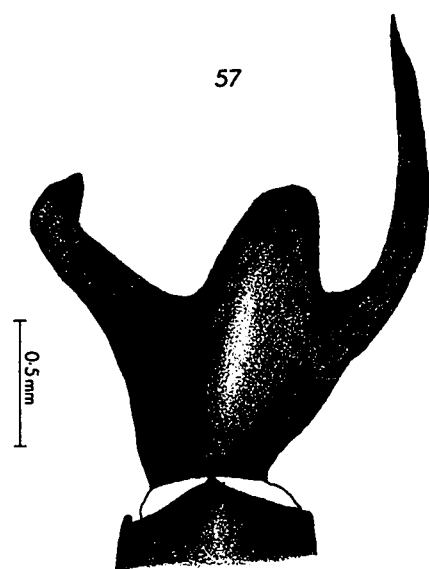
Figs. 43 - 56.

43. Dorsal view of left palpal tibia of Callobius gertschi. 44. Full view of left median apophysis of C. gertschi. 45. Mesoventral view of mesal process of C. gertschi showing spatulate tip. 46. Mirror image of dorsal view of right palpal tibia of Callobius sierra (left palpal tibia has mesal process broken off). 47. Dorsal view of right palpal tibia of C. sierra. 48. Full view of left median apophysis of C. sierra. 49. Dorsal view of left palpal tibia of Callobius kamelus. 50. Full view of left median apophysis of C. kamelus. 51. Mesoventral view of median apophysis of C. kamelus. 52. Dorsal view of left palpal tibia of Callobius tamarus. 53. Full view of left median apophysis of C. tamarus. 54. Mesoventral view of median apophysis of C. tamarus. 55. Dorsal view of left palpal tibia of Callobius klamath. 56. Full view of left median apophysis of C. klamath.



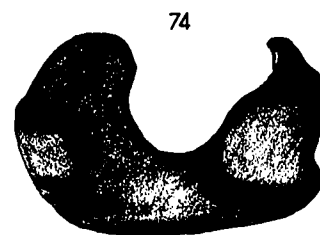
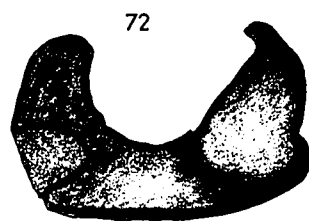
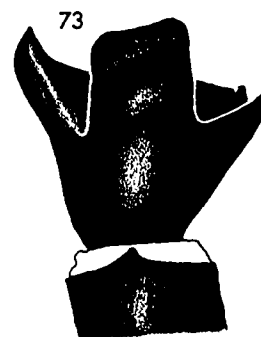
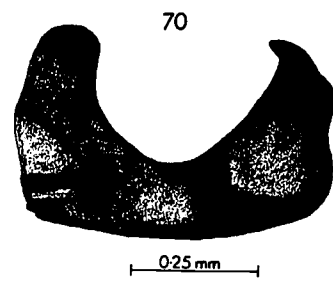
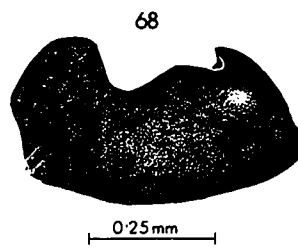
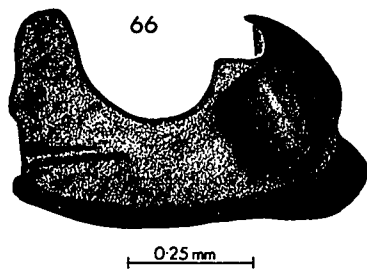
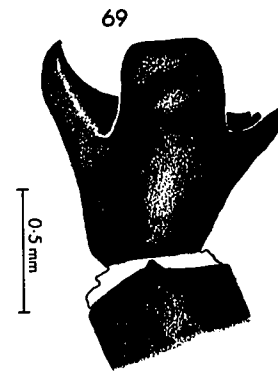
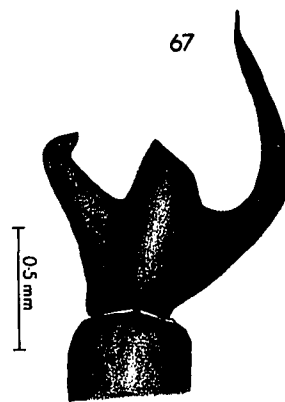
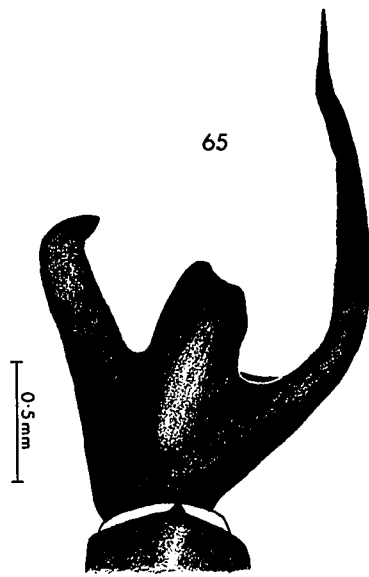
Figs. 57 - 64.

57. Dorsal view of left palpal tibia of Callobius nevadensis. 58. Full view of left median apophysis of C. nevadensis. 59. Dorsal view of left palpal tibia of Callobius nomeus from Mount Rainier National Park, Washington. 60. Full view of left median apophysis of C. nomeus from Mount Rainier National Park, Washington. 61. Dorsal view of left palpal tibia of C. nomeus from Jasper National Park, Alberta. 62. Full view of left median apophysis of C. nomeus from Jasper National Park, Alberta. 63. Dorsal view of left palpal tibia of C. nomeus from White Pass, Washington. 64. Full view of left median apophysis of C. nomeus from White Pass, Washington.



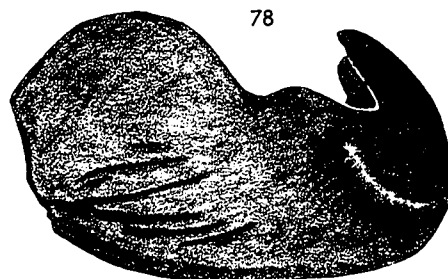
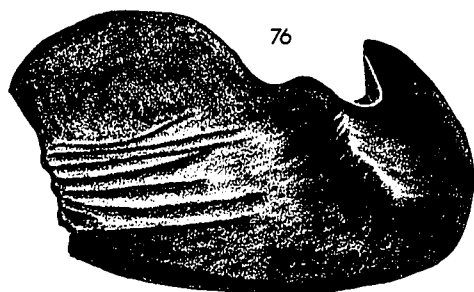
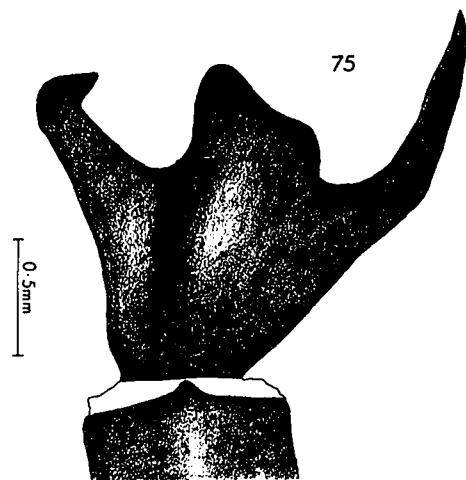
Figs. 65 - 74.

65. Dorsal view of left palpal tibia of Callobius olympus. 66. Full view of left median apophysis of C. olympus. 67. Dorsal view of left palpal tibia of Callobius rothi. 68. Full view of left median apophysis of C. rothi. 69. Dorsal view of left palpal tibia of Callobius pictus from Washington. 70. Full view of left median apophysis of C. pictus from Washington. 71. Dorsal view of left palpal tibia of C. pictus from Oregon. 72. Full view of left median apophysis of C. pictus from Oregon. 73. Dorsal view of left palpal tibia of C. pictus from California. 74. Full view of left median apophysis of C. pictus from California.

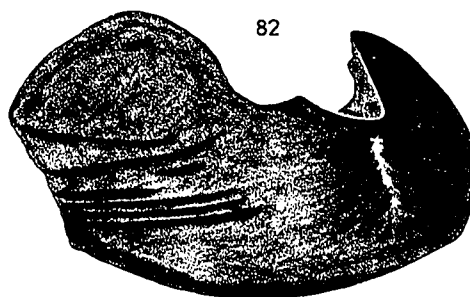
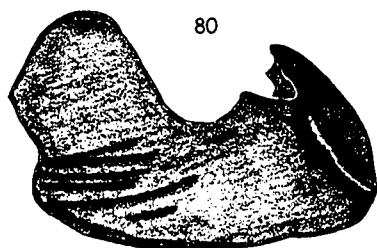
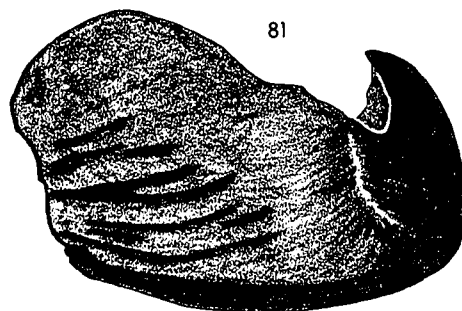


Figs. 75 - 82.

75. Dorsal view of left palpal tibia of Callobius severus from Comox, British Columbia. 76. Full view of left median apophysis of C. severus from Comox, British Columbia. 77. Dorsal view of left palpal tibia of C. severus from Sonoma County, California (compared with lectotype of this species). 78. Full view of left median apophysis of C. severus from Sonoma County, California. 79. Dorsal view of left palpal tibia of C. severus from Santa Barbara County, California. 80. Full view of left median apophysis of C. severus from Santa Barbara County, California. 81. Full view of left median apophysis of C. severus from Seattle, Washington. 82. Full view of left median apophysis of C. severus from Marin County, California.

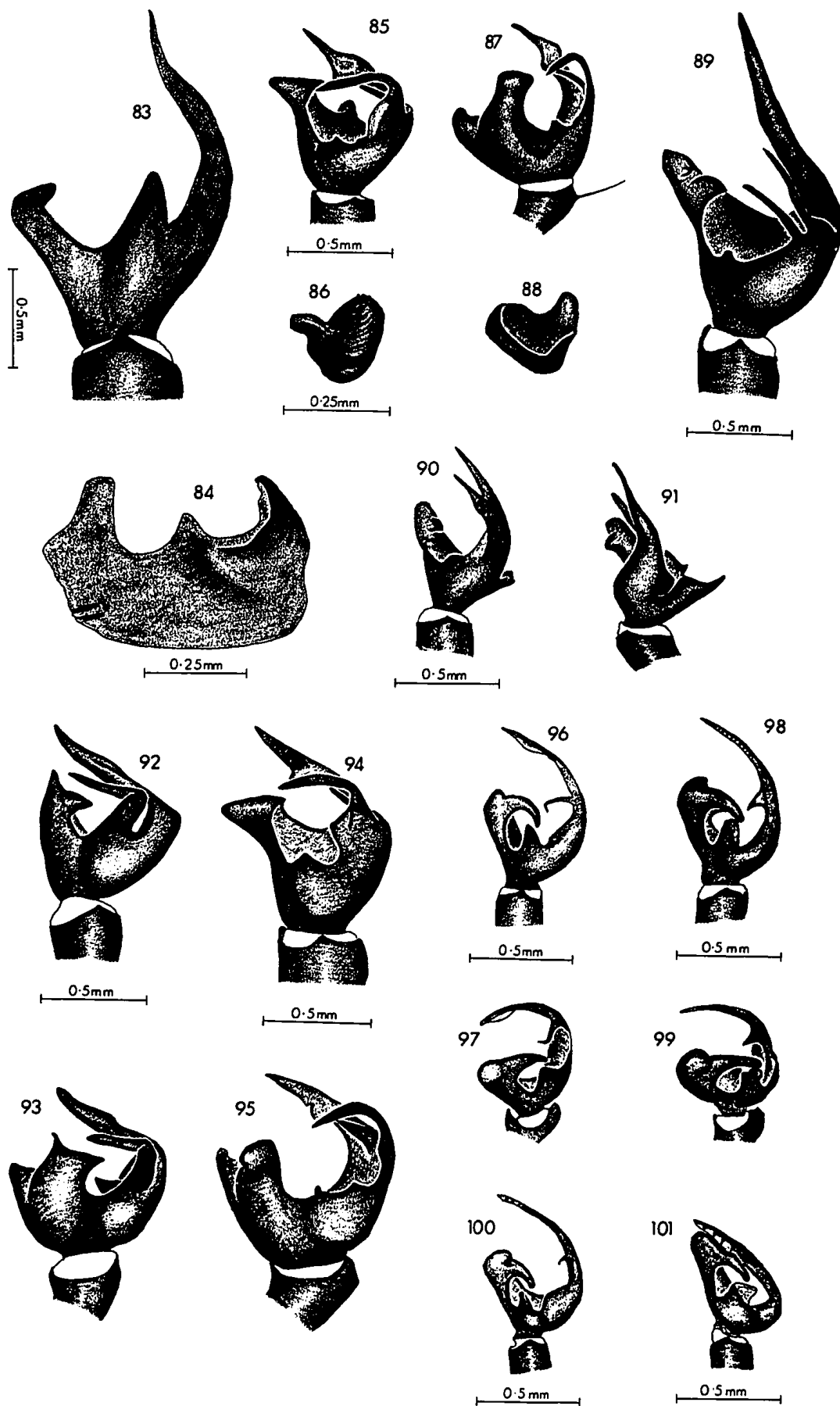


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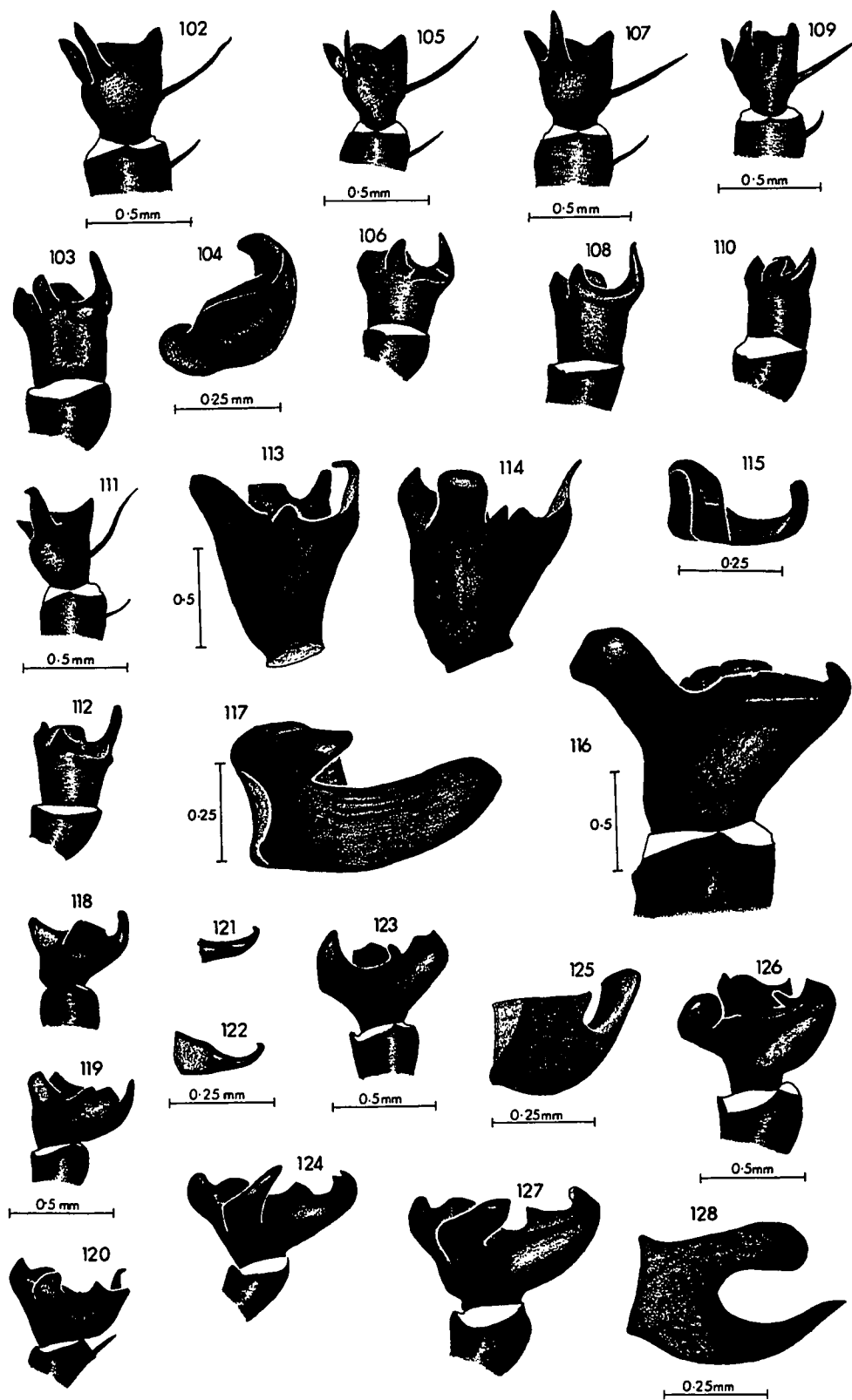
Figs. 83 - 101.

83. Dorsal view of left palpal tibia of Callobius tehama. 84. Full view of left median apophysis of C. tehama. 85. Dorsal view of tibia of Callioplus euoplus. 86. Full view of left median apophysis of C. euoplus. 87. Ectal view of left palpal tibia of C. euoplus. 88. Dorsal view of left median apophysis of C. euoplus. 89. Dorsal view of left palpal tibia of Callioplus tibialis. 90. Dorsal view of left palpal tibia of Callioplus macarius. 91. Mesal view of left palpal tibia of C. macarius. 92. Dorsolateral view of left palpal tibia of Callioplus wabritaskus. 93. Ectal view of left palpal tibia of C. wabritaskus. 94. Dorsal view of left palpal tibia of Callioplus spenceri. 95. Ectal view of left palpal tibia of C. spenceri. 96. Dorsal view of left palpal tibia of Callioplus pantoplus. 97. Anterolateral view of left palpal tibia of C. pantoplus. 98. Dorsal view of left palpal tibia of Callioplus hoplites. 99. Anterolateral view of left palpal tibia of C. hoplites. 100. Dorsal view of left palpal tibia of Callioplus hoplomachus. 101. Dorsal view of left palpal tibia of Callioplus armipotens.



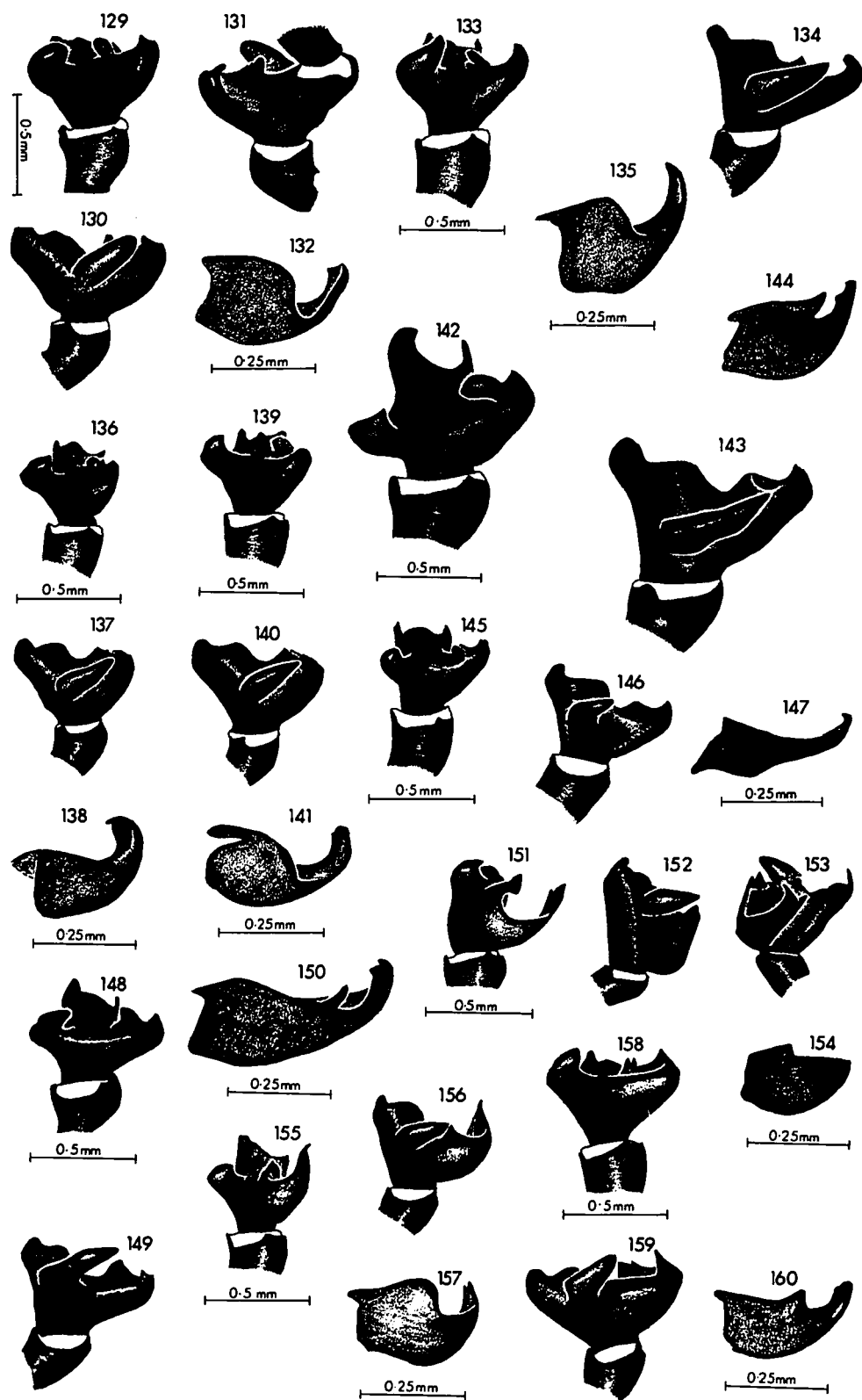
Figs. 102 - 128.

102. Dorsal view of left palpal tibia of Pimus pitus. 103. Ectal view of left palpal tibia of P. pitus. 104. Ventrolateral view of left median apophysis of P. pitus. 105. Dorsal view of left palpal tibia of Pimus iviei. 106. Ectal view of left palpal tibia of P. iviei. 107. Dorsal view of left palpal tibia of Pimus napa. 108. Ectal view of left palpal tibia of P. napa. 109. Dorsal view of left palpal tibia of Pimus fractus. 110. Ectal view of left palpal tibia of P. fractus. 111. Dorsal view of left palpal tibia of Pimus desiccatus. 112. Ectal view of left palpal tibia of P. desiccatus. 113. Dorsal view of left palpal tibia of Amaurobius similis. 114. Ectal view of left palpal tibia of A. similis. 115. Full view of left median apophysis of A. similis. 116. Dorsal view of left palpal tibia of Amaurobius ferox. 117. Full view of left median apophysis of A. ferox. 118. Dorsal view of left palpal tibia of Amaurobius borealis. 119. Dorso-lateral view of left palpal tibia of A. borealis. 120. Ectal view of left palpal tibia of A. borealis. 121. Full view of left median apophysis of A. borealis (slightly teneral specimen). 122. Full view of left median apophysis of A. borealis (dark specimen). 123. Dorso-lateral view of left palpal tibia of Amaurobius agastus. 124. Ectal view of left palpal tibia of A. agastus. 125. Full view of left median apophysis of A. agastus. 126. Dorso-lateral view of left palpal tibia of Amaurobius dorotheae. 127. Ectal view of left palpal tibia of A. dorotheae. 128. Full view of left median apophysis of A. dorotheae.



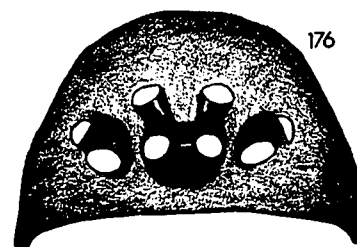
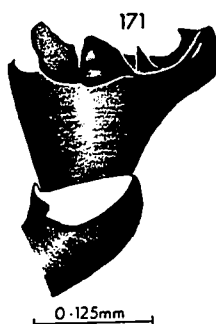
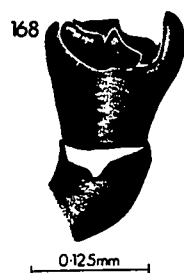
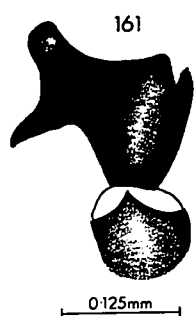
Figs. 129 - 160.

129. Dorso-lateral view left palpal tibia Amaurobius mathetes. 130. Ectal view left palpal tibia A. mathetes. 131. Mesal view left palpal tibia A. mathetes. 132. Full view left median apophysis A. mathetes. 133. Dorso-lateral view left palpal tibia Amaurobius tulare. 134. Ectal view left palpal tibia A. tulare. 135. Full view left median apophysis A. tulare. 136. Dorso-lateral view left palpal tibia Amaurobius tamalpais. 137. Ectal view left palpal tibia A. tamalpais. 138. Full view left median apophysis A. tamalpais. 139. Dorso-lateral view left palpal tibia Amaurobius vexans. 140. Ectal view left palpal tibia A. vexans. 141. Full view left median apophysis A. vexans. 142. Dorso-lateral view left palpal tibia Amaurobius latescens. 143. Ectal view left palpal tibia A. latescens. 144. Full view left median apophysis A. latescens. 145. Dorso-lateral view left palpal tibia Amaurobius heathi. 146. Ectal view left palpal tibia A. heathi. 147. Full view left median apophysis A. heathi. 148. Dorso-lateral view left palpal tibia Amaurobius barbaricus. 149. Ectal view left palpal tibia A. barbaricus. 150. Full view left palpal tibia A. barbaricus. 151. Dorso-lateral view left palpal tibia Amaurobius distortus. 152. Ectal view left palpal tibia A. distortus. 153. Mesal view left palpal tibia A. distortus. 154. Full view left median apophysis A. distortus. 155. Dorso-lateral view left palpal tibia Amaurobius intermedius. 156. Ectal view left palpal tibia A. intermedius. 157. Full view left median apophysis A. intermedius. 158. Dorso-lateral view left palpal tibia Amaurobius prosopidus. 159. Ectal view left palpal tibia A. prosopidus. 160. Full view left median apophysis A. prosopidus.



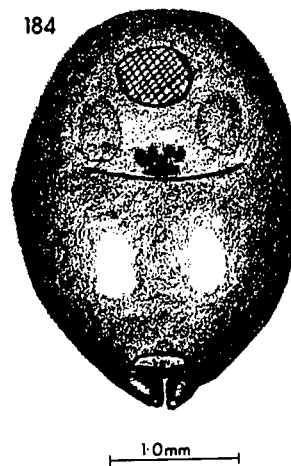
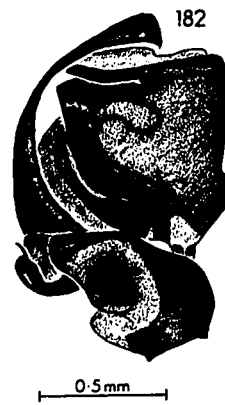
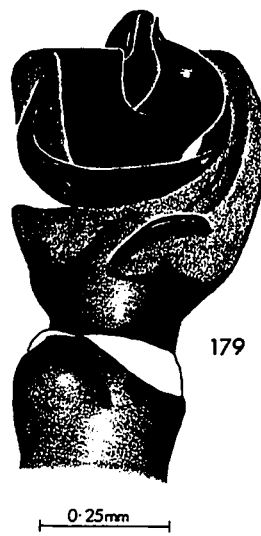
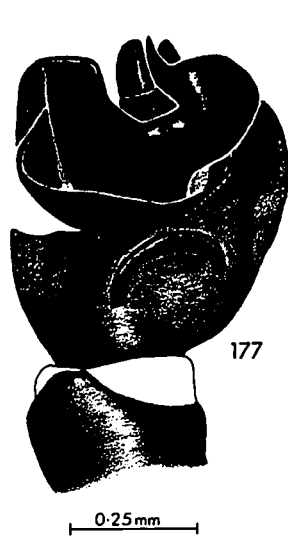
Figs. 161 - 176.

161. Dorsal view left palpal tibia Zanomys kaiba. 162. Ectal view left palpal tibia Z. kaiba. 163. Ventro-lateral view left palpal organ Z. kaiba. 164. Dorsal view left palpal tibia Zanomys sagittaria. 165. Ectal view left palpal tibia Z. sagittaria. 166. Dorsal view, slightly mesad, left palpal tibia Zanomys aquilonia. 167. Ectal view left palpal tibia Z. aquilonia. 168. Ectal view left palpal tibia Zanomys californica. 169. Ventro-lateral view left palpal organ Z. californica. 170. Ventral view left palpal organ Z. californica. 171. Ectal view left palpal tibia Zanomys hesperia. 172. Dorsal view left palpal tibia Z. hesperia. 173. Ectal view left palpal tibia Arctobius agelenoides. 174. Dorsal view left palpal tibia A. agelenoides. 175. Ventral view left palpal tibia Z. agelenoides. 176. Anterior view carapace A. agelenoides showing relative eye sizes and positions.



Figs. 177 - 184.

177. Dorsal view left palpal tibia Titanoeca nigrella. 178. Mesal view left palpal organ T. nigrella. 179. Dorsal view left palpal tibia Titanoeca silvicola. 180. Mesal view left palpal organ T. silvicola. 181. Dorsal view left palpal tibia Titanoeca americana. 182. Mesal view left palpal organ T. americana. 183. Dorsal view left palpal tibia Titanoeca brunnea. 184. Ventral view opisthosoma T. brunnea showing two pale spots.

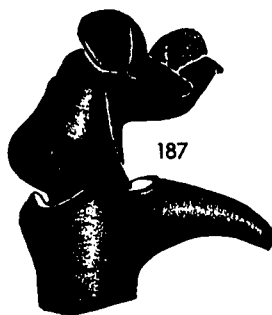


Figs. 185 - 197.

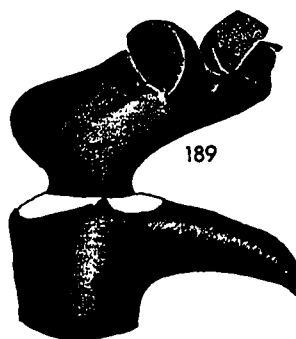
185. Dorsal view left palpal tibia and patella Goeldia mexicana. 186. Full view left palpal conductor Goeldia mexicana. 187. Dorsal view left palpal tibia and patella Goeldia chinipensis. 188. Full view left palpal conductor Goeldia chinipensis. 189. Dorsal view left palpal tibia and patella Goeldia obscura. 190. Full view left palpal conductor Goeldia obscura. 191. Dorsal view left palpal tibia and patella Goeldia luteipes. 192. Dorso-lateral view left palpal patella G. luteipes. 193. Full view left palpal conductor G. luteipes. 194. Ventral view left palpal organ Metaltella simoni. 195. Ectal view left palpal organ M. simoni. 196. Ectal view left palpal tibia Ixeuticus martius. 197. Dorsal view left palpal tibia I. martius.



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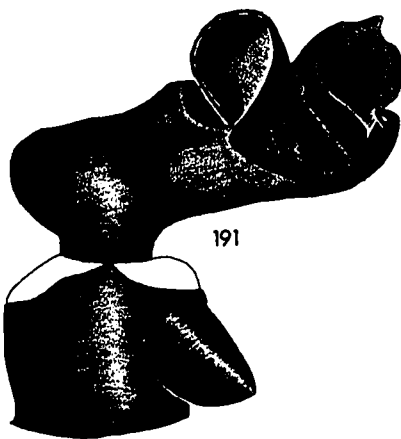
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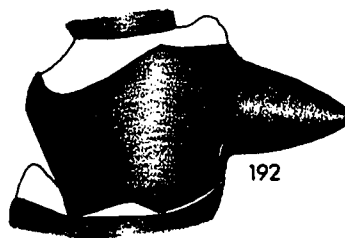
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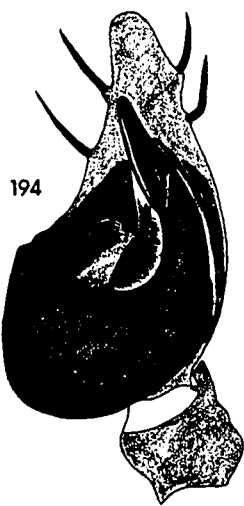
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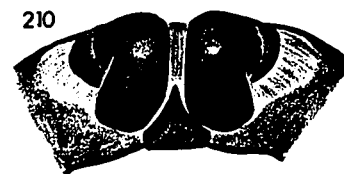
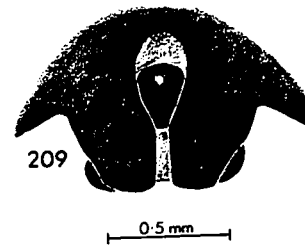
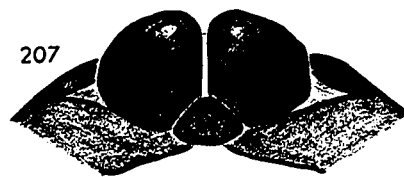
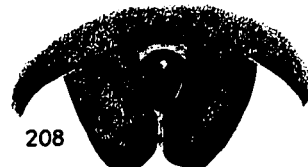
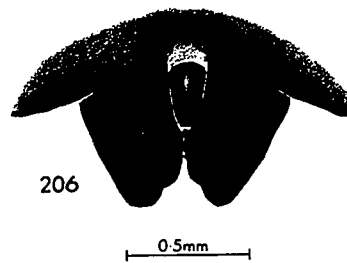
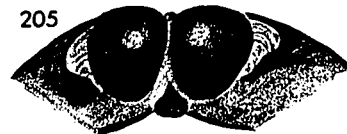
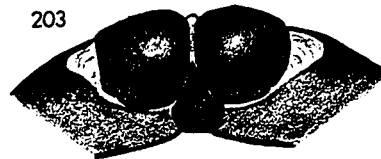
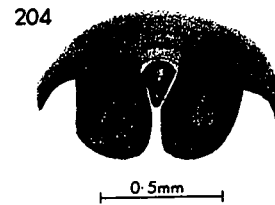
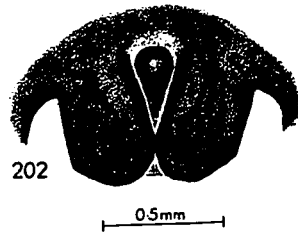
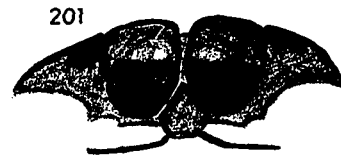
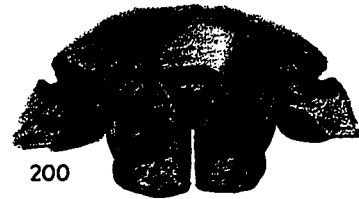
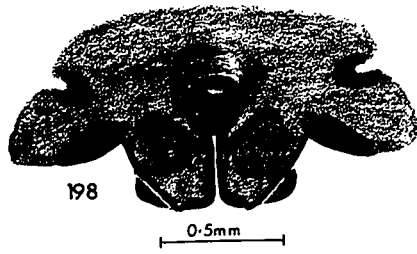


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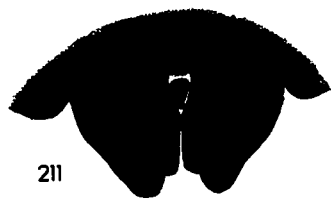
Figs. 198 - 210.

198. Ventral view epigynum Callobius angelus. 199. Posterior view epigynum C. angelus. 200. Ventral view epigynum C. angelus (another specimen). 201. Posterior view epigynum C. angelus (same specimen as in Fig. 200). 202. Ventral view epigynum C. angelus (third specimen). 203. Posterior view epigynum C. angelus (third specimen). 204. Ventral view epigynum C. angelus (fourth specimen). 205. Posterior view epigynum C. angelus (fourth specimen). 206. Ventral view epigynum Callobius panther. 207. Posterior view epigynum C. panther. 208. Ventral view epigynum C. panther (second specimen). 209. Ventral view epigynum Callobius paskenta. 210. Posterior view epigynum C. paskenta.

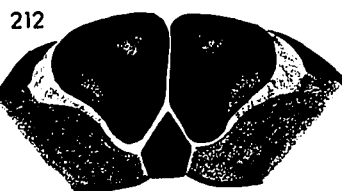
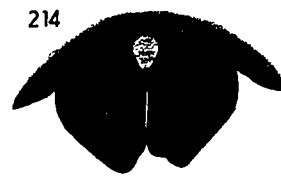
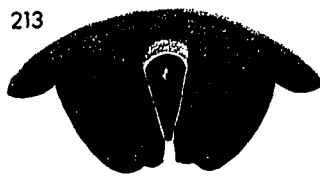


Figs. 211 - 226.

211. Ventral view epigynum Callobius paynei (from type locality). 212. Posterior view epigynum C. paynei (same specimen as in Fig. 211). 213. Ventral view epigynum C. paynei (from Siskiyou, Jackson County, Oregon). 214. Ventral view epigynum C. paynei (second specimen from type locality). 215. Ventral view epigynum C. paynei (third specimen from type locality). 216. Ventral view epigynum Callobius arizonicus (from Chiricahua Mountains, Arizona). 217. Posterior view epigynum C. arizonicus (from Chiricahua Mountains, Arizona). 218. Ventral view epigynum C. arizonicus (from Baldy Peak, Apache County, Arizona). 219. Posterior view epigynum C. arizonicus (same specimen as in Fig. 218). 220. Ventral view epigynum C. arizonicus (from Socorro County, New Mexico). 221. Posterior view epigynum C. arizonicus (same specimen as in Fig. 220). 222. Ventral view epigynum C. arizonicus (from Iron County, New Mexico). 223. Posterior view epigynum C. arizonicus (same specimen as in Fig. 222). 224. Dorsal view opisthosoma Callobius bennetti. 225. Ventral view epigynum C. bennetti. 226. Posterior view epigynum C. bennetti.



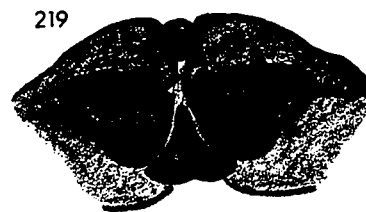
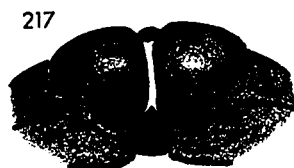
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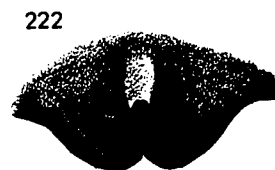
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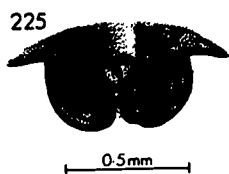
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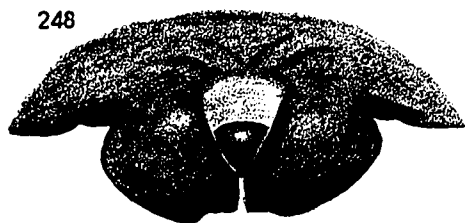
Figs. 227 - 247.

227. Ventral view Callobius canada. 228. Posterior view epigynum C. canada. 229. Ventral view epigynum Callobius deces. 230. Posterior view epigynum C. deces. 231. Ventral view epigynum Callobius enus. 232. Posterior view epigynum C. enus. 233. Ventral view epigynum C. enus (second specimen). 234. Posterior view epigynum C. enus (second specimen). 235. Ventral view epigynum Callobius gertschi. 236. Posterior view epigynum C. gertschi. 237. Posterior view epigynum C. gertschi (second specimen). 238. Ventral view epigynum Callobius sierra. 239. Posterior view epigynum C. sierra. 240. Ventral view epigynum Callobius hyonasus. 241. Posterior view epigynum C. hyonasus. 242. Ventral view epigynum Callobius kamelus. 243. Posterior view epigynum C. kamelus. 244. Ventral view epigynum Callobius tamarus. 245. Posterior view epigynum C. tamarus. 246. Ventral view epigynum Callobius klamath. 247. Posterior view epigynum C. klamath.

Figs. 248 - 258.

248. Ventral view epigynum Callobius nevadensis (compared with type material). 249. Posterior view epigynum C. nevadensis (same specimen as in Fig. 248). 250. Ventral view epigynum C. nevadensis (second specimen). 251. Posterior view epigynum C. nevadensis (same specimen as in Fig. 250). 252. Ventral view epigynum C. nevadensis (paratype of Callobius shastus). 253. Ventral view of epigynum C. nevadensis (unusually large specimen). 254. Ventral view epigynum Callobius nomeus (from Jasper National Park, Alberta). 255. Posterior view epigynum C. nomeus (same specimen as in Fig. 254). 256. Ventral view epigynum C. nomeus (from Gunnison County, Colorado). 257. Posterior view epigynum C. nomeus (same specimen as in Fig. 256). 258. Ventral view epigynum C. nomeus (from Cedar Lake, Washington).

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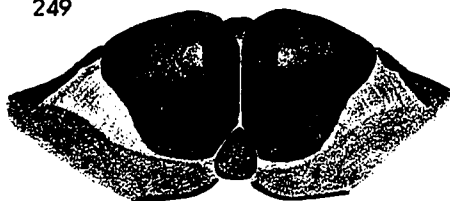
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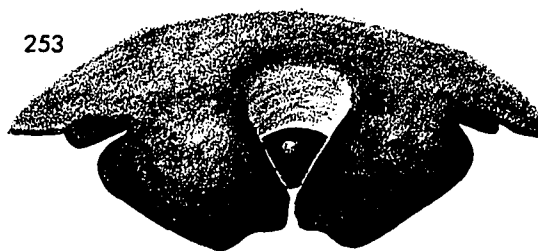


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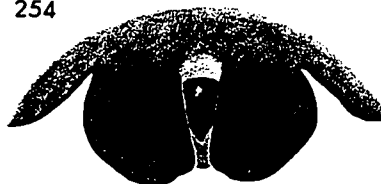
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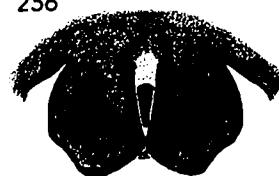
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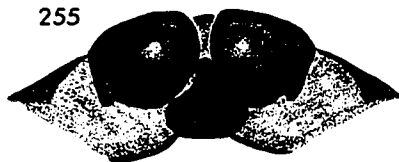


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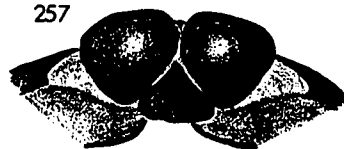
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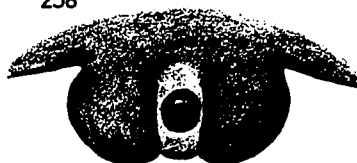
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257



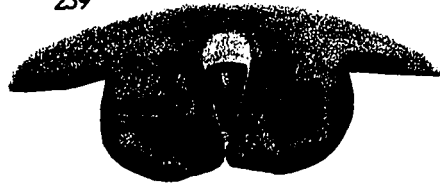
258



Figs. 259 - 270.

259. Ventral view epigynum Callobius olympus. 260. Posterior view epigynum C. olympus. 261. Ventral view epigynum C. olympus (second specimen). 262. Ventral view epigynum Callobius rothi. 263. Posterior view epigynum C. rothi. 264. Ventral view epigynum Callobius pauculus. 265. Posterior view epigynum C. pauculus. 266. Ventral view epigynum Callobius pictus (Lewis County, Washington). 267. Ventral view epigynum C. pictus (second specimen from Lewis County, Washington). 268. Posterior view epigynum C. pictus (same specimen as in Fig. 267). 269. Ventral view epigynum C. pictus (from Afognak Island, Alaska). 270. Posterior view epigynum C. pictus (same specimen as in Fig. 269).

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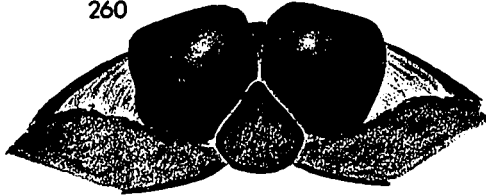


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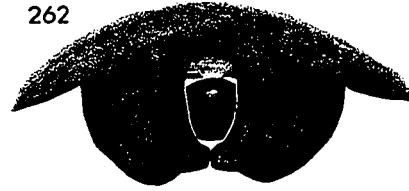
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260



262



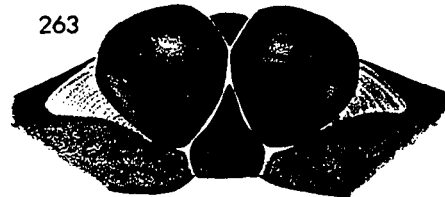
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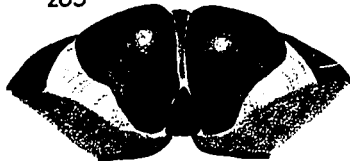


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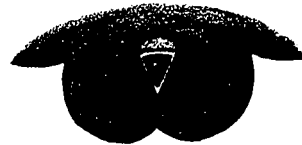
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265



266



267

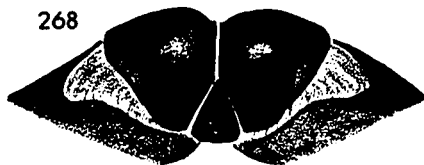


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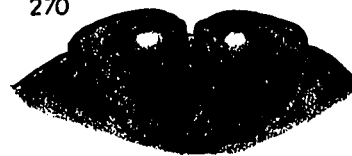
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268



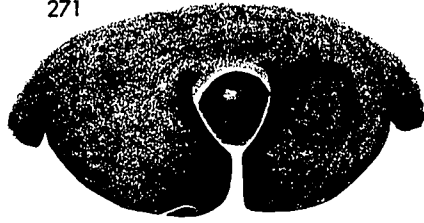
270



Figs. 271 - 281.

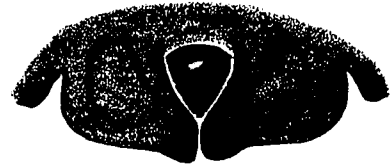
271. Ventral view epigynum Callobius severus (from Jackson County, Oregon). 272. Posterior view epigynum C. severus (same specimen as in Fig. 271). 273. Ventral view epigynum C. severus (from Santa Barbara County, California). 274. Posterior view epigynum C. severus (same specimen as in Fig. 273). 275. Ventral view epigynum C. severus (from Olympia, Washington). 276. Posterior view epigynum C. severus (same specimen as in Fig. 275). 277. Ventral view epigynum C. severus (from Vancouver Island, British Columbia). 278. Posterior view epigynum C. severus (same specimen as in Fig. 277). 279. Ventral view epigynum C. severus (another specimen from Vancouver Island, British Columbia). 280. Ventral view epigynum Callobius tehama. 281. Posterior view epigynum C. tehama.

271

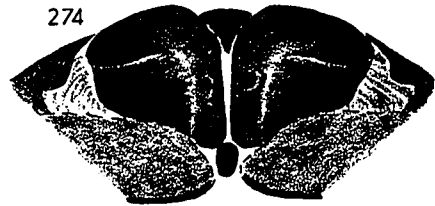


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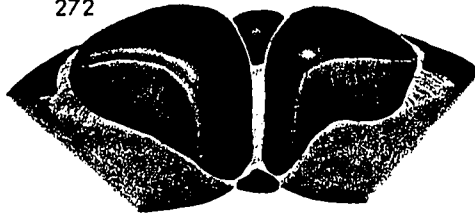
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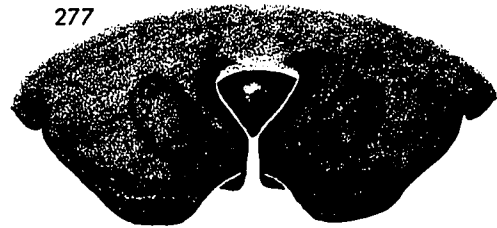
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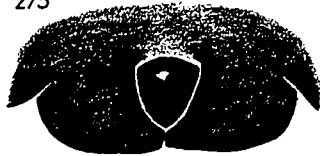
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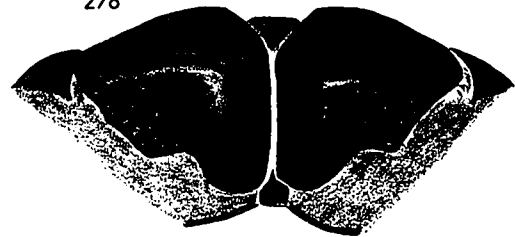
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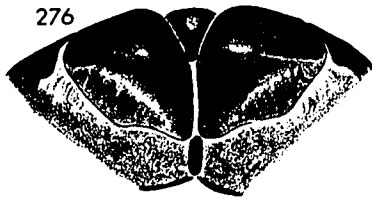
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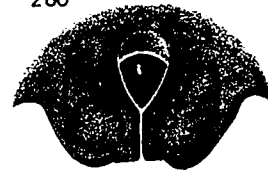
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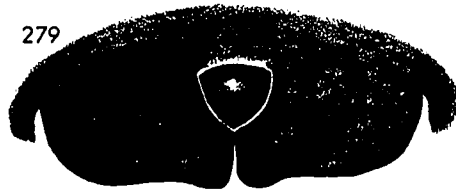


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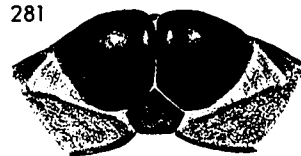


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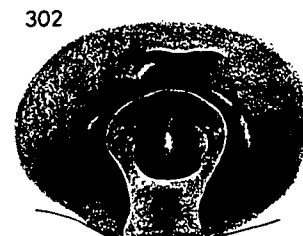
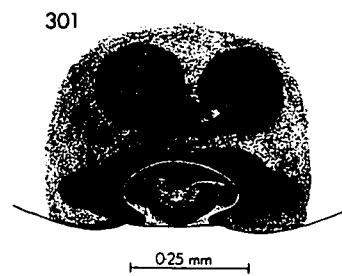
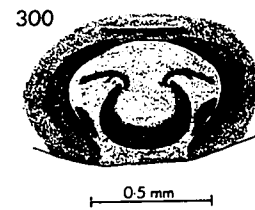
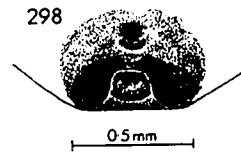
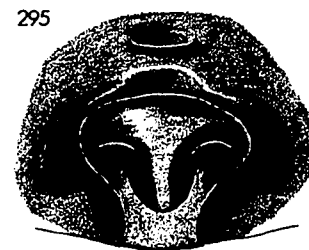
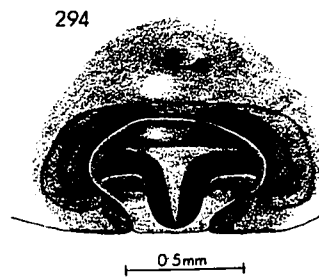
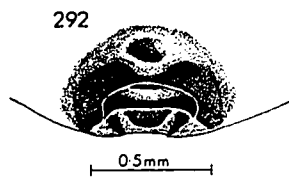
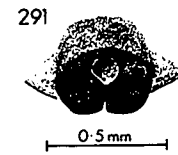
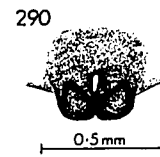
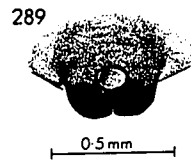
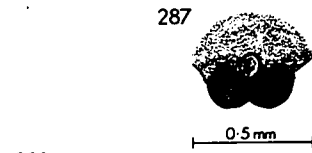
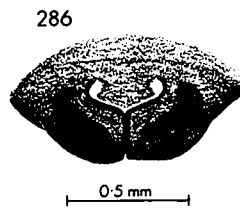
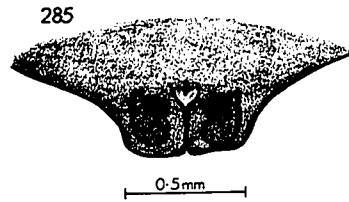
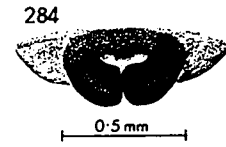
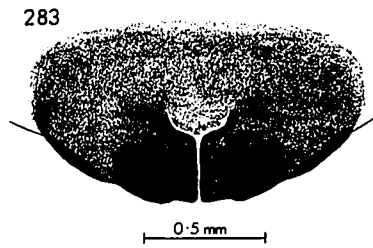
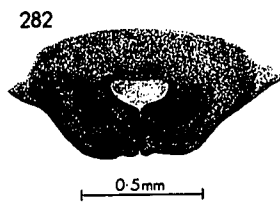


281



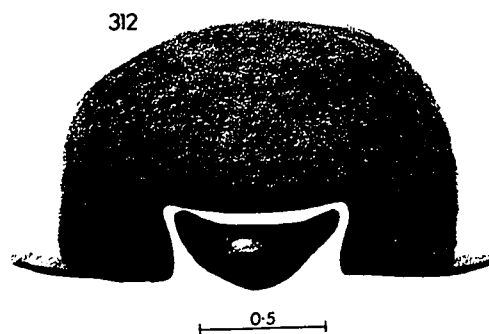
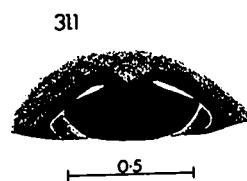
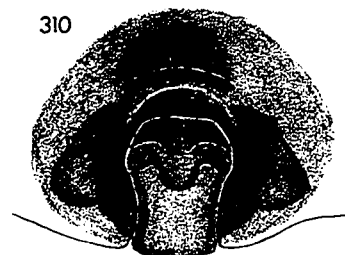
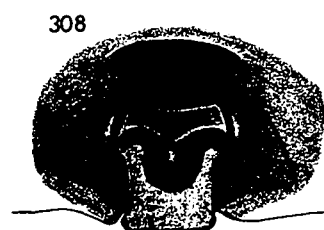
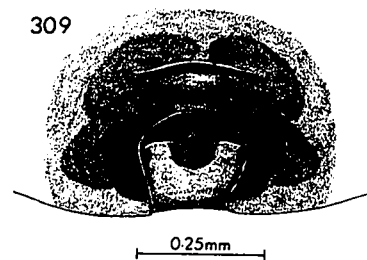
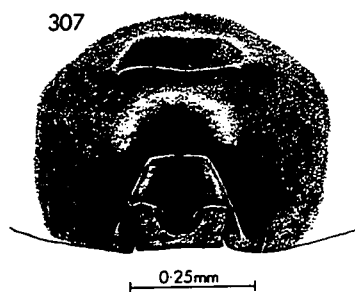
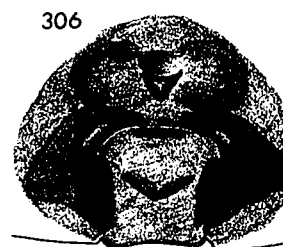
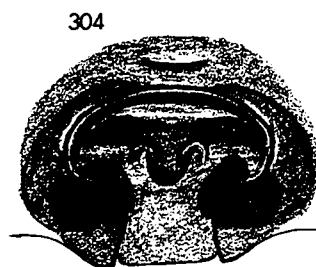
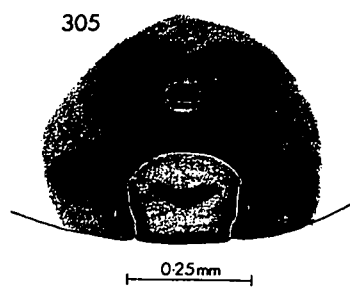
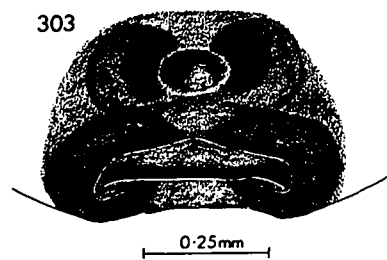
Figs. 282 - 302.

282. Ventral view epigynum Callioplus euoplus. 283. Ventral view epigynum Callioplus tibialis. 284. Ventral view epigynum Callioplus macarius. 285. Ventral view epigynum Callioplus wabritaskus. 286. Ventral view epigynum Callioplus spenceri. 287. Ventral view epigynum Callioplus pantoplus. 288. Ventral view epigynum C. pantoplus (second specimen). 289. Ventral view epigynum Callioplus hoplites. 290. Ventral view epigynum Callioplus hoplomachus. 291. Ventral view epigynum Callioplus armipotens. 292. Ventral view epigynum Pimus pitus. 293. Posteroventral view epigynum P. pitus. 294. Ventral view epigynum Pimus iviei. 295. Posteroventral view epigynum P. iviei. 296. Ventral view epigynum P. napa. 297. Posteroventral view epigynum C. napa. 298. Ventral view epigynum Pimus fractus. 299. Posteroventral view epigynum P. fractus. 300. Posteroventral view epigynum Pimus desiccatus. 301. Ventral view epigynum Pimus nawtawaketus. 302. Posteroventral view epigynum P. nawtawaketus.



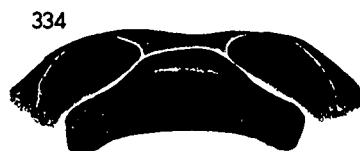
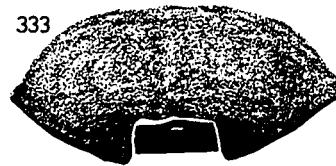
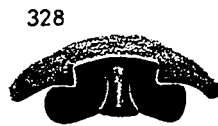
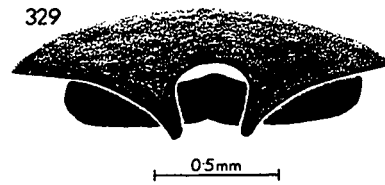
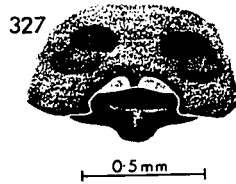
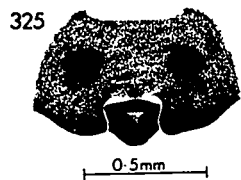
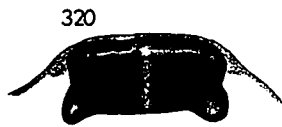
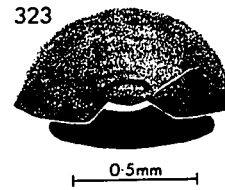
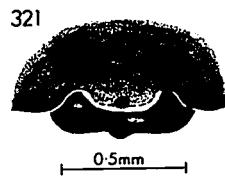
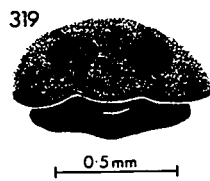
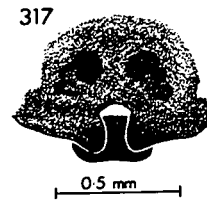
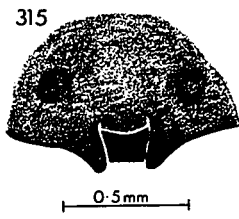
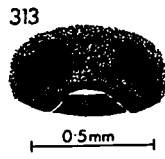
Figs. 303 - 312.

303. Ventral view epigynum Pimus salemensis. 304. Posteroventral view epigynum P. salemensis. 305. Ventral view epigynum Pimus hesperellus. 306. Posteroventral view epigynum P. hesperellus. 307. Ventral view epigynum Pimus eldorado. 308. Posteroventral view epigynum P. eldorado. 309. Ventral view epigynum Pimus leucus. 310. Posteroventral view epigynum P. leucus. 311. Ventral view epigynum Amaurobius similis. 312. Ventral view epigynum Amaurobius ferox.



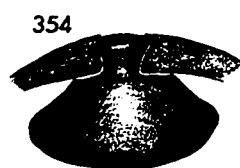
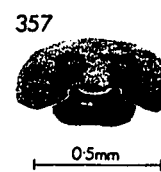
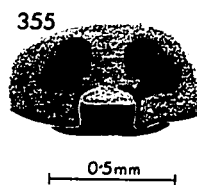
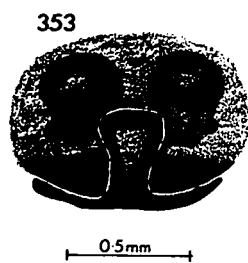
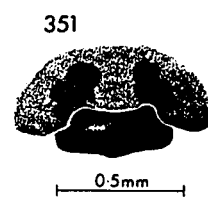
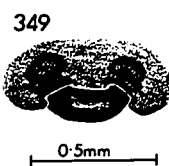
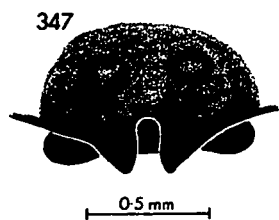
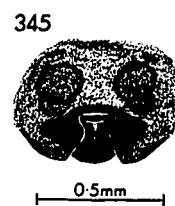
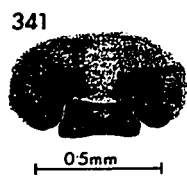
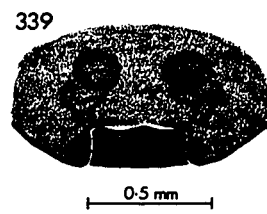
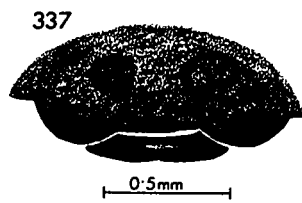
Figs. 313 - 334.

313. Ventral view epigynum Amaurobius borealis. 314. Posterior view epigynum A. borealis. 315. Ventral view epigynum Amaurobius agastus. 316. Posteroventral view epigynum A. agastus. 317. Ventral view epigynum A. agastus (second specimen). 318. Posterior view epigynum A. agastus (second specimen). 319. Ventral view epigynum Amaurobius dorotheae. 320. Posterior view epigynum A. dorotheae. 321. Ventral view epigynum Amaurobius mathetes. 322. Posterior view epigynum A. mathetes. 323. Ventral view epigynum Amaurobius tulare. 324. Posterior view epigynum A. tulare. 325. Ventral view epigynum Amaurobius tamalpais. 326. Posterior view epigynum A. tamalpais. 327. Ventral view epigynum Amaurobius vexans. 328. Posterior view epigynum A. vexans. 329. Ventral view epigynum Amaurobius latescens (paratype). 330. Posterior view epigynum A. latescens (paratype). 331. Ventral view epigynum A. latescens (holotype of Walmus hermosus). 332. Posterior view epigynum A. latescens (holotype Walmus hermosus). 333. Ventral view epigynum A. latescens (from Los Angeles, California). 334. Posterior view epigynum A. latescens (from Los Angeles, California).



Figs. 335 - 358.

335. Ventral view epigynum Amaurobius heathi. 336. Posterior view epigynum A. heathi. 337. Ventral view epigynum Amaurobius barbaricus. 338. Posterior view epigynum A. barbaricus. 339. Ventral view epigynum Amaurobius corruptus. 340. Posterior view epigynum A. corruptus. 341. Ventral view epigynum Amaurobius diablo (holotype). 342. Posterior view epigynum A. diablo (holotype). 343. Ventral view epigynum A. diablo (second specimen). 344. Ventral view epigynum A. diablo (third specimen). 345. Ventral view epigynum Amaurobius galeritus. 346. Posterior view epigynum A. galeritus. 347. Ventral view epigynum Amaurobius hagiellus. 348. Posterior view epigynum A. hagiellus. 349. Ventral view epigynum Amaurobius intermedius. 350. Posterior view epigynum A. intermedius. 351. Ventral view epigynum Amaurobius mephisto. 352. Posterior view epigynum A. mephisto. 353. Ventral view epigynum Amaurobius minutus. 354. Posterior view epigynum A. minutus. 355. Ventral view epigynum Amaurobius palomar. 356. Posterior view epigynum A. palomar. 357. Ventral view epigynum Amaurobius pilosus. 358. Posterior view epigynum A. pilosus.



Figs. 359 - 374.

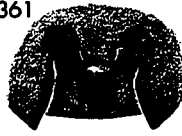
359. Ventral view epigynum Amaurobius transversus. 360. Posterior view epigynum A. transversus. 361. Ventral view epigynum Amaurobius triangularis. 362. Posterior view epigynum A. triangularis. 363. Ventral view epigynum Amaurobius prosopidus. 364. Posterior view epigynum A. prosopidus. 365. Ventral view epigynum Zanomys kaiba. 366. Ventral view epigynum Z. kaiba (second specimen). 367. Ventral view epigynum Zanomys sagittaria. 368. Ventral view epigynum Zanomys aquilonia. 369. Ventral view epigynum Zanomys californica. 370. Dorsal view opisthosoma Z. californica. 371. Ventral view epigynum Zanomys ochra. 372. Ventral view epigynum Zanomys feminina. 373. Dorsal view opisthosoma Z. feminina. 374. Ventral view epigynum Zanomys ultima.

359



0.5mm

361



0.5mm

363



0.5mm

360



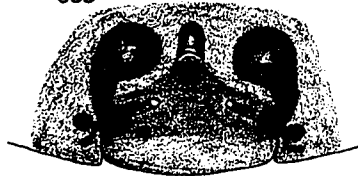
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364

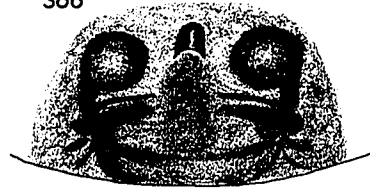


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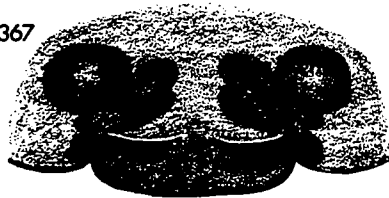


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366



367



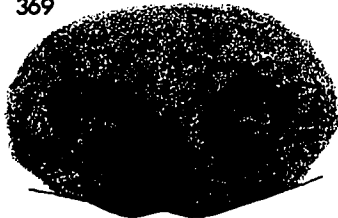
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368



0.125mm

369



0.125mm

370



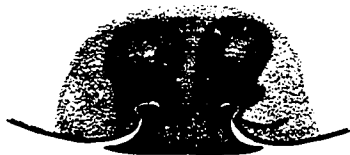
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371



0.125mm

372



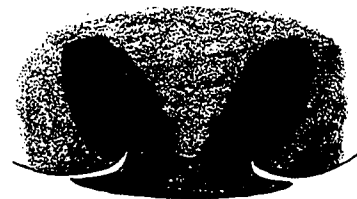
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373



1.0mm

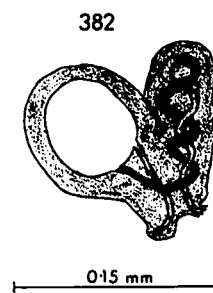
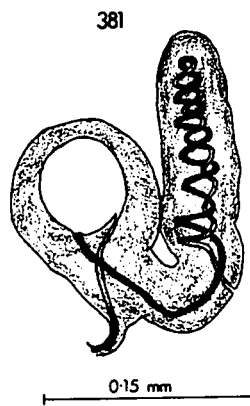
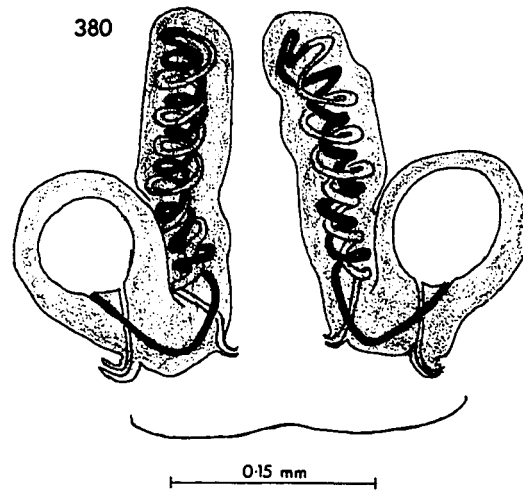
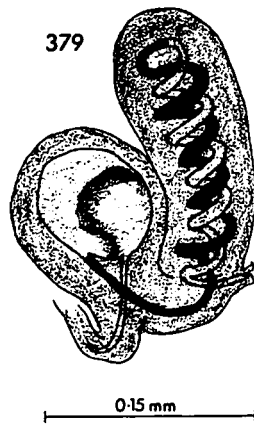
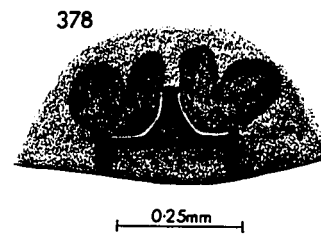
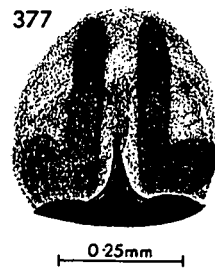
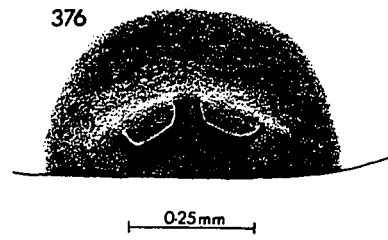
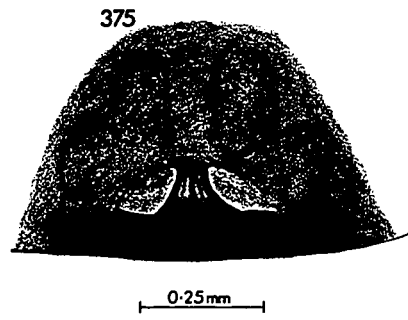
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0.125mm

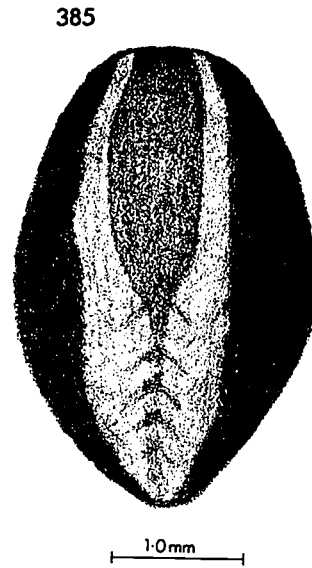
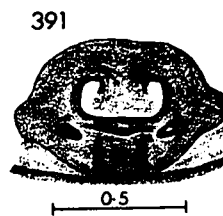
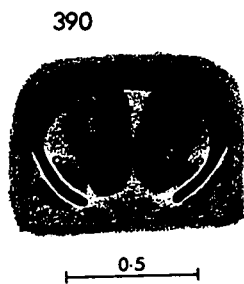
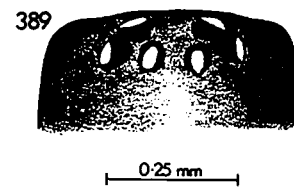
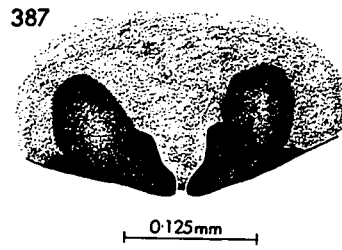
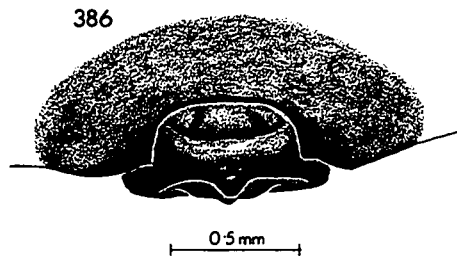
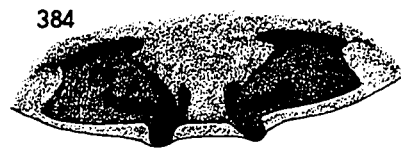
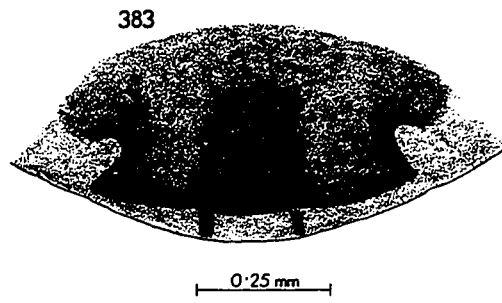
Figs. 375 - 382.

375. Ventral view epigynum Titanoeca nigrella. 376. Ventral view epigynum Titanoeca silvicola. 377. Ventral view epigynum Titanoeca americana. 378. Ventral view epigynum Titanoeca brunnea. 379. Dorsal view cleared bursa copulatrix and spermatheca Titanoeca nigrella. 380. Dorsal view cleared bursae copulatrices and spermathecae Titanoeca americana. 381. Dorsal view cleared bursa copulatrix and spermatheca Titanoeca silvicola. 382. Dorsal view cleared bursa copulatrix and spermatheca Titanoeca brunnea.



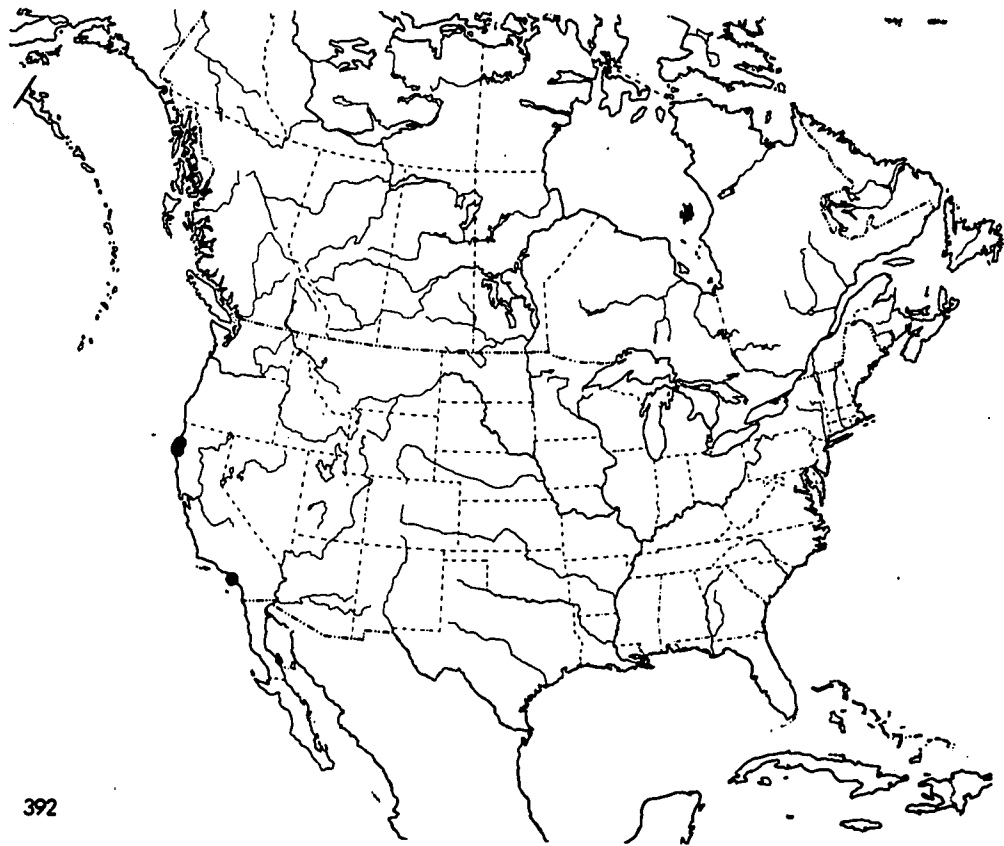
Figs. 383 - 391.

383. Ventral view epigynum Goeldia mexicana. 384. Cleared view epigynum Goeldia mexicana. 385. Dorsal view opisthosoma Arctobius agelenoides. 386. Ventral view epigynum Arctobius agelenoides. 387. Ventral view epigynum Tugana cavatica. 388. Posterior view epigynum T. cavatica. 389. Dorsal view ocular area of carapace T. cavatica. 390. Ventral view epigynum Metaltella simoni. 391. Ventral view epigynum Ixeuticus martius.

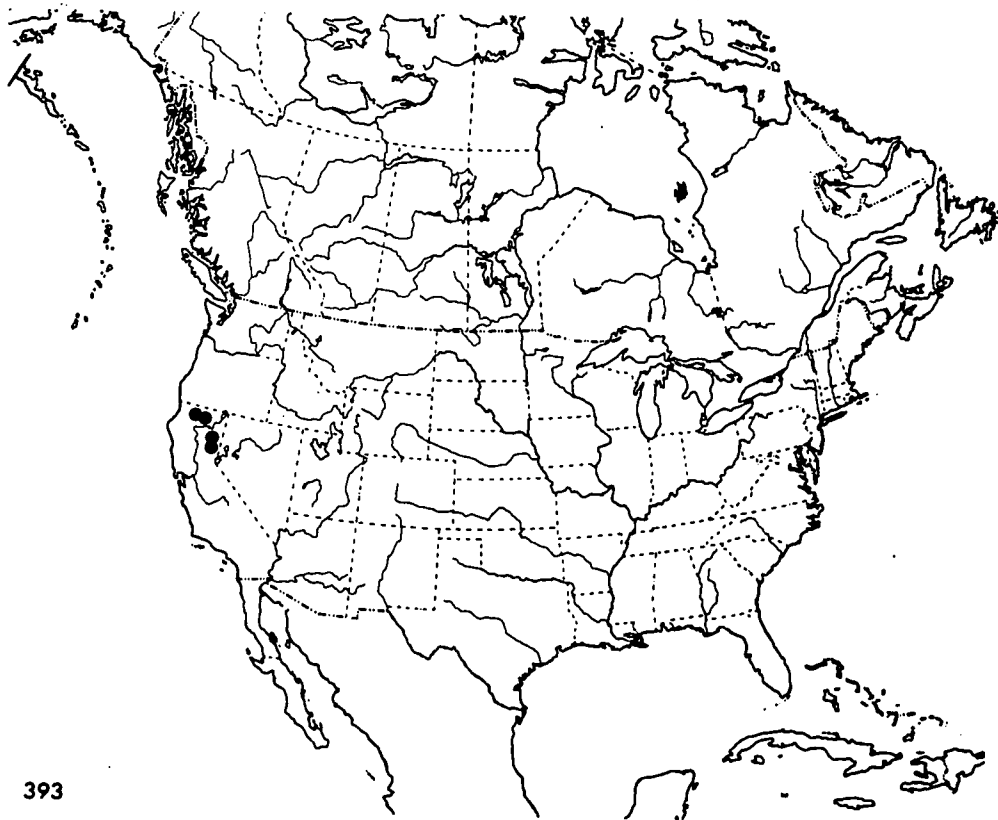


Figs. 392 - 393.

392. Geographical distribution of Callobius angelus. 393. Geographical distribution of Callobius manzanita.



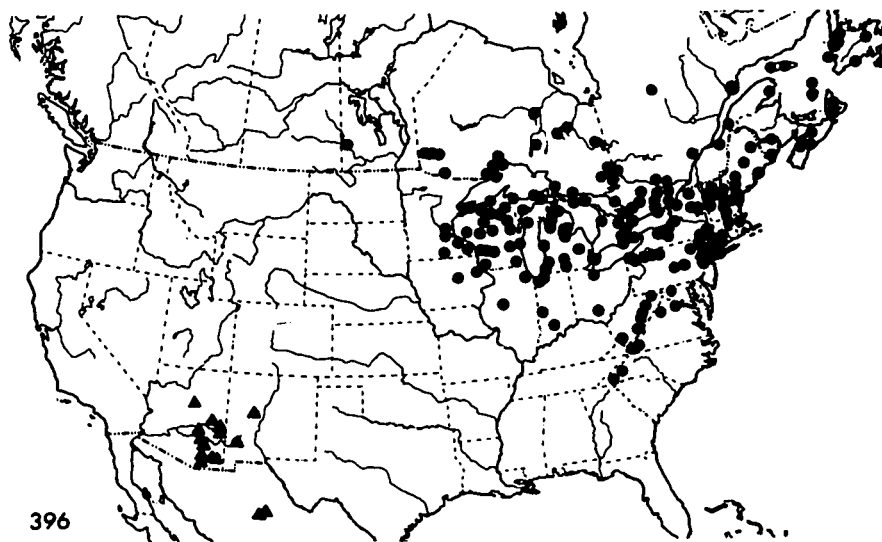
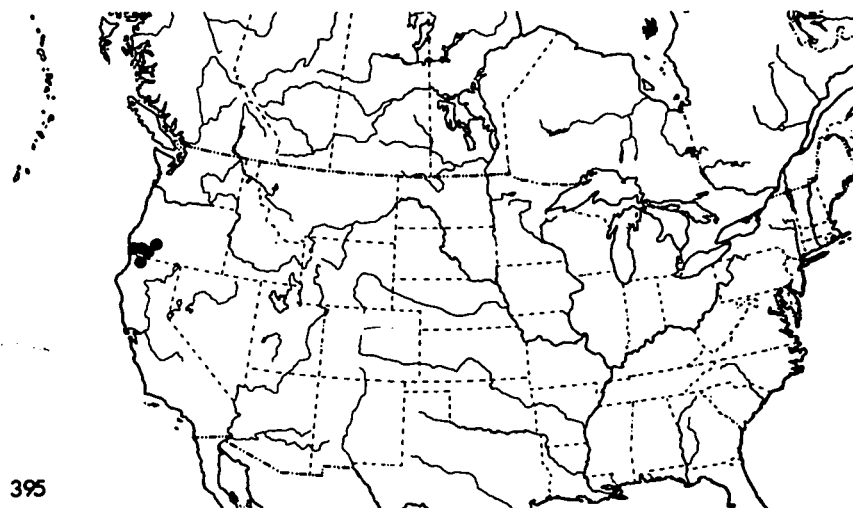
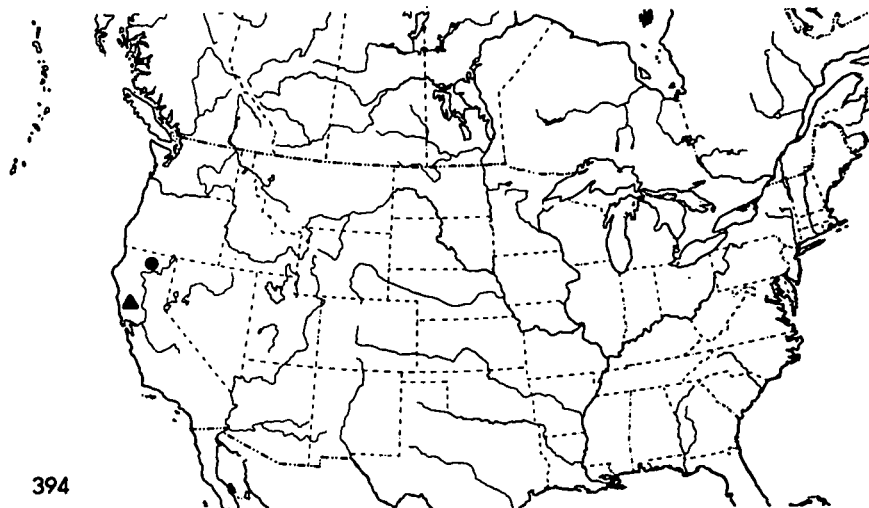
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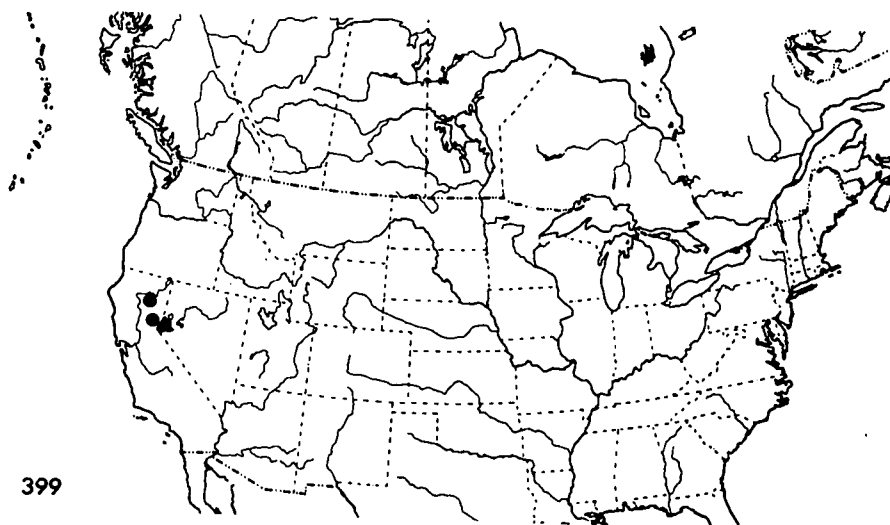
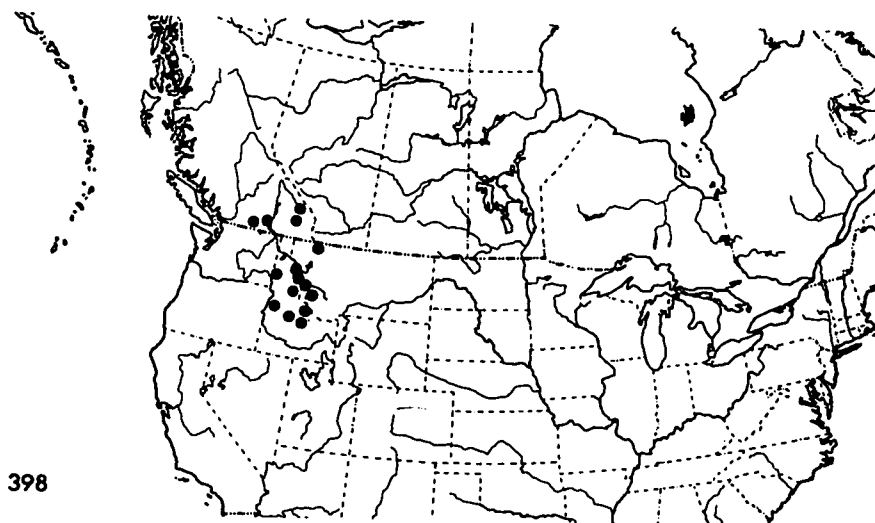
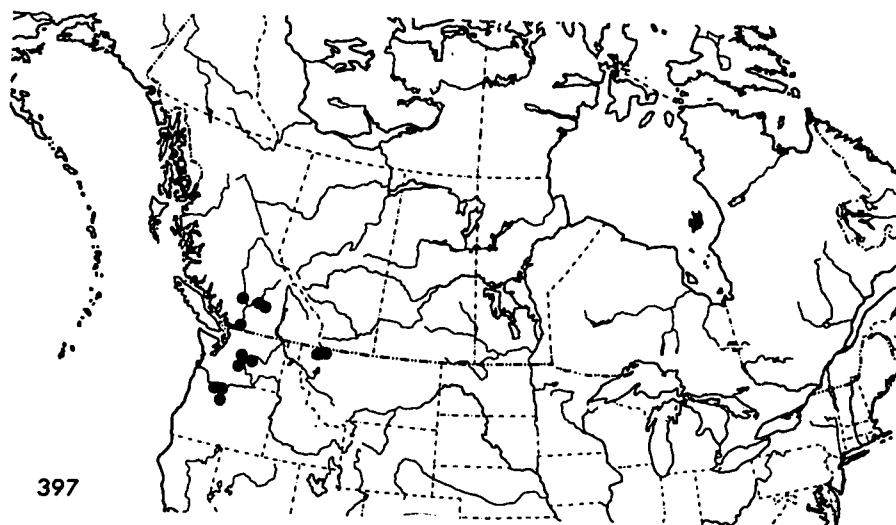
Figs. 394 - 396.

394. Geographical distribution of Callobius panther (●) and Callobius paskenta (▲). 395. Geographical distribution of Callobius paynei.
396. Geographical distribution of Callobius arizonicus (▲) and Callobius bennetti (●).



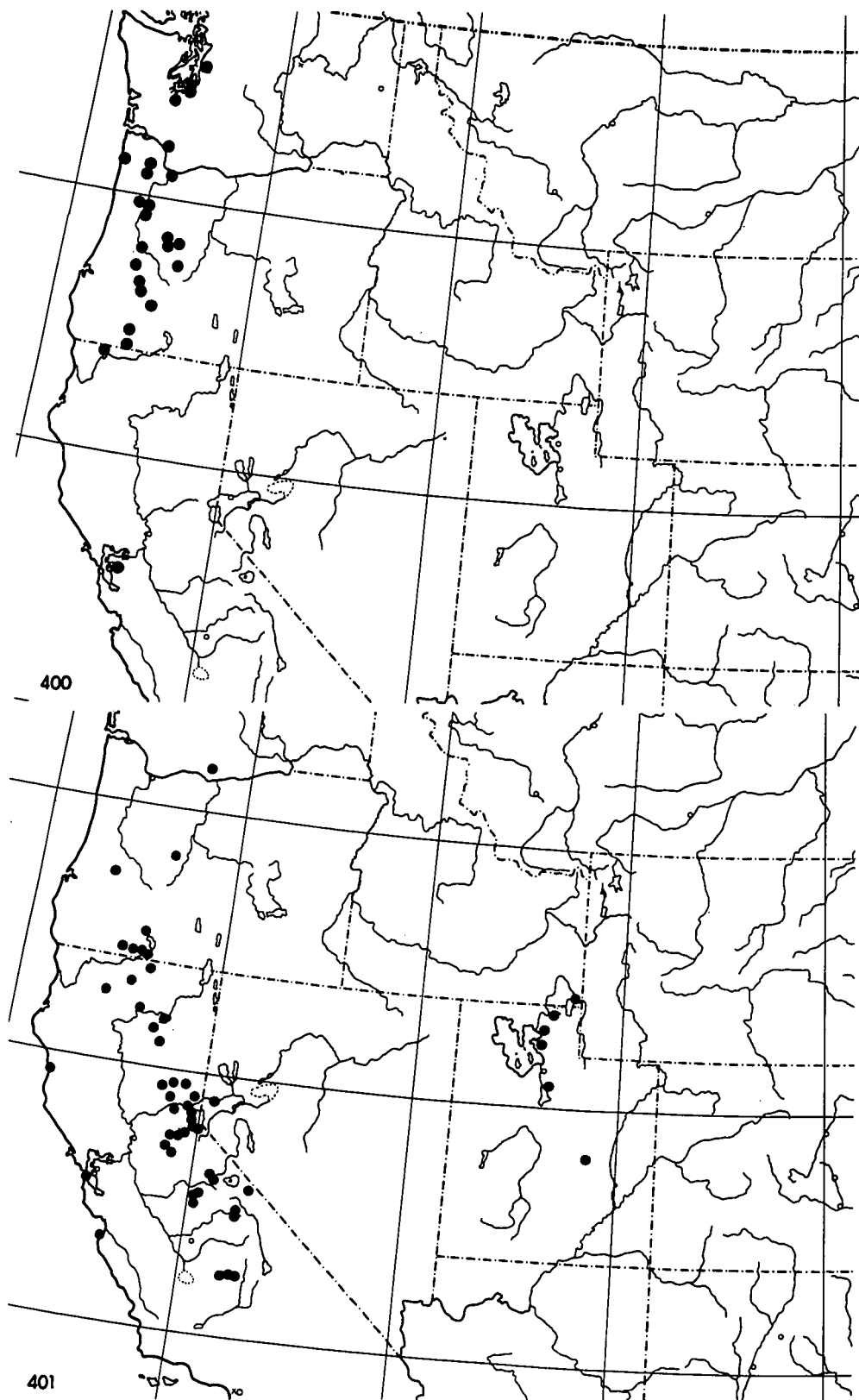
Figs. 397 - 399.

397. Geographical distribution of Callobius canada. 398. Geographical distribution of Callobius enus. 399. Geographical distribution of Callobius gertschi (●) and Callobius sierra (▲).



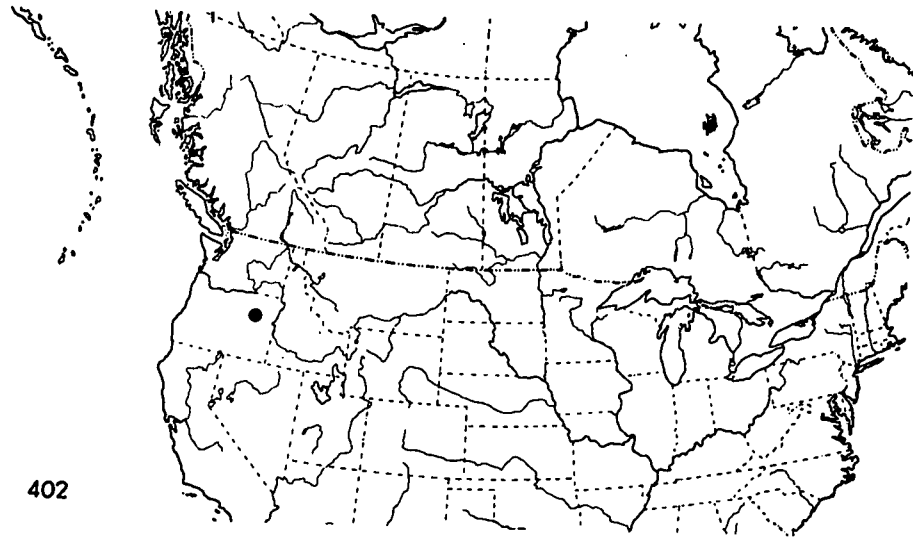
Figs. 400 - 401.

400. Geographical distribution of Callobius deces. 401. Geographical distribution of Callobius nevadensis.

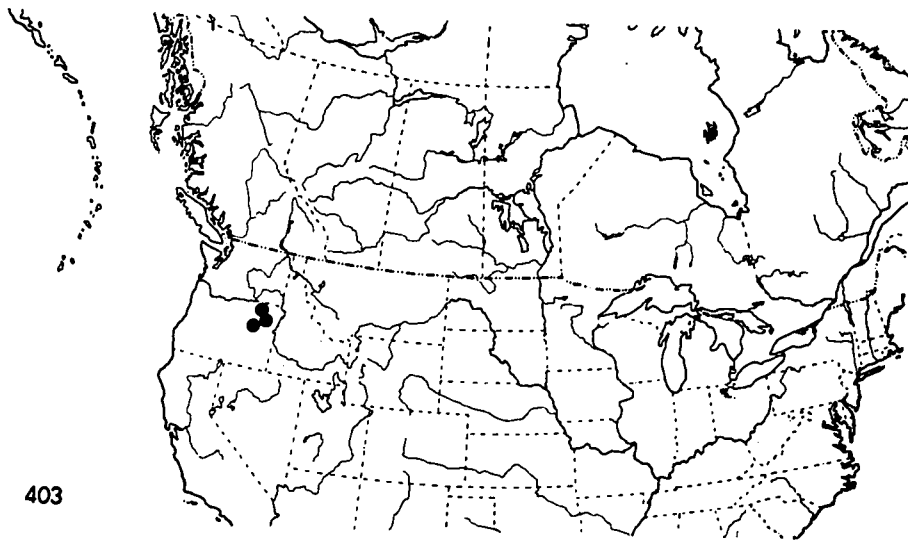


Figs. 402 - 404.

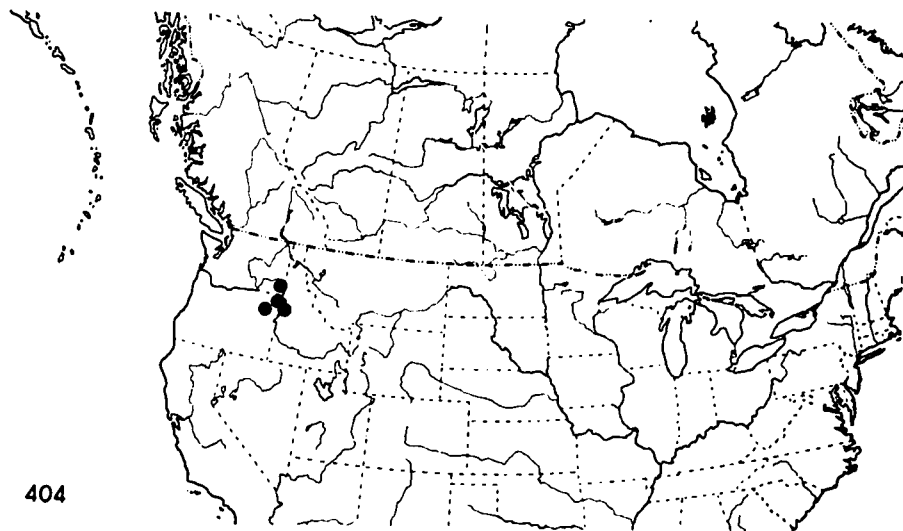
402. Geographical distribution of Callobius hyonasus. 403. Geographical distribution of Callobius kamelus. 404. Geographical distribution of Callobius tamarus.



402



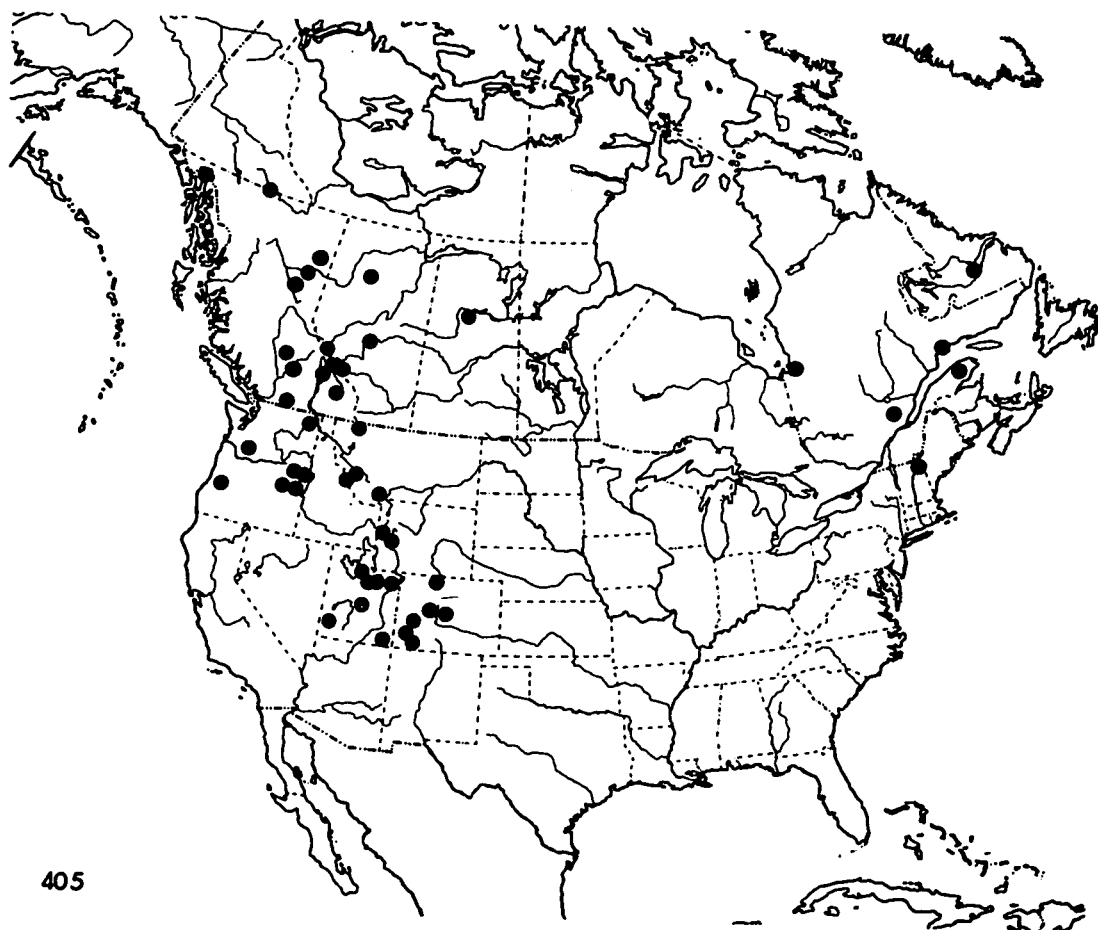
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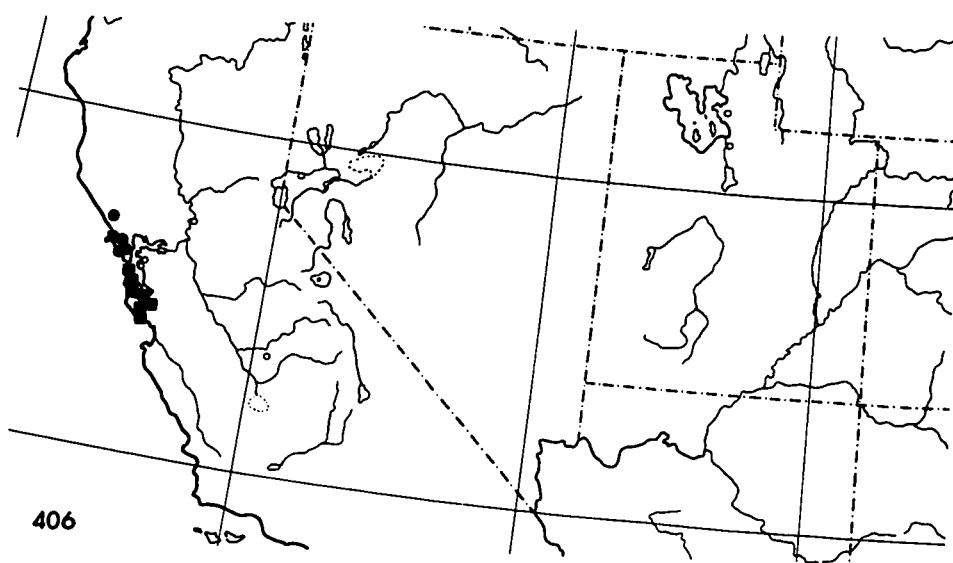
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Figs. 405 - 406.

405. Geographical distribution of Callobius nomeus. 406. Geographical distribution of Callobius olympus (■) and Callobius rothi (●).



405



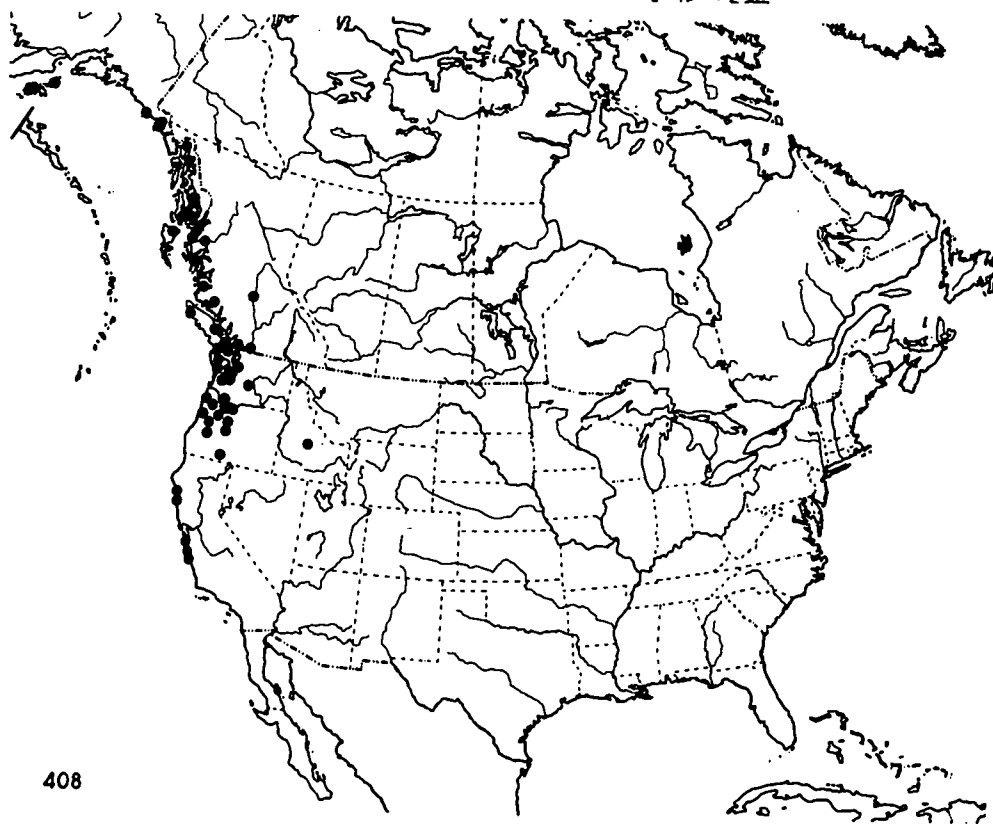
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Figs. 407 - 408.

407. Geographical distribution of Callobius klamath (●), Callobius pauculus (▲), and Callobius tehama (▼). 408. Geographical distribution of Callobius pictus.



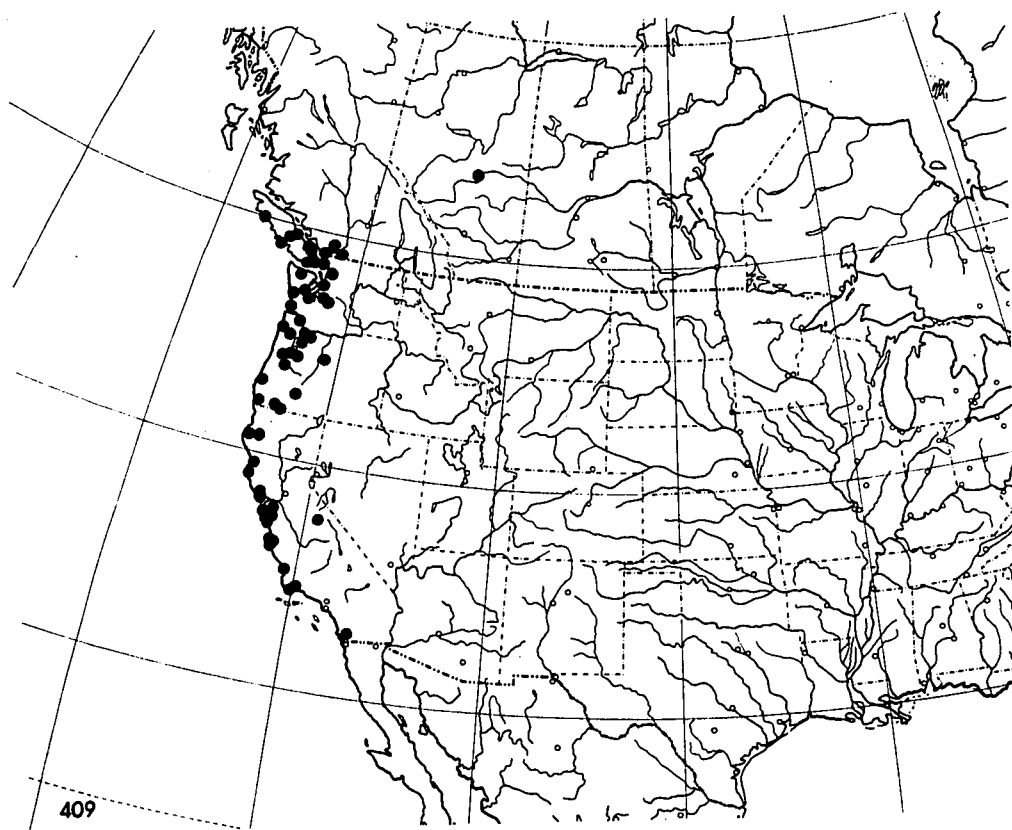
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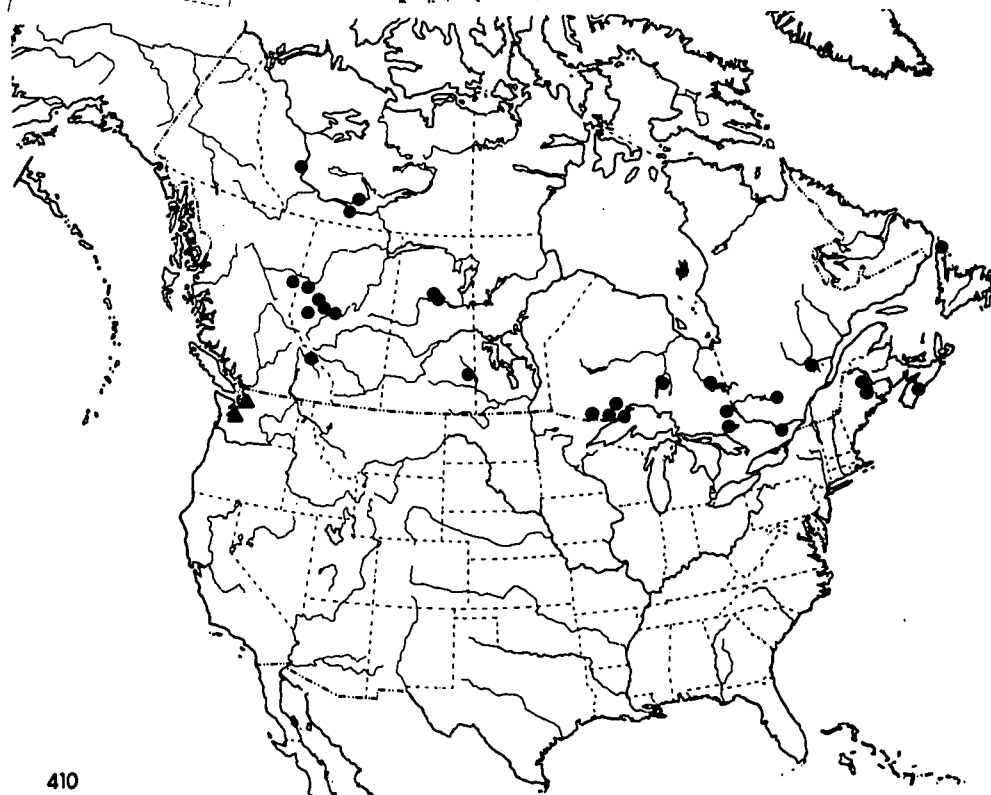
408

Figs. 409 - 410.

409. Geographical distribution of Callobius severus. 410. Geographical distribution of Callioplus euoplus (●) and Callioplus spenceri (▲).



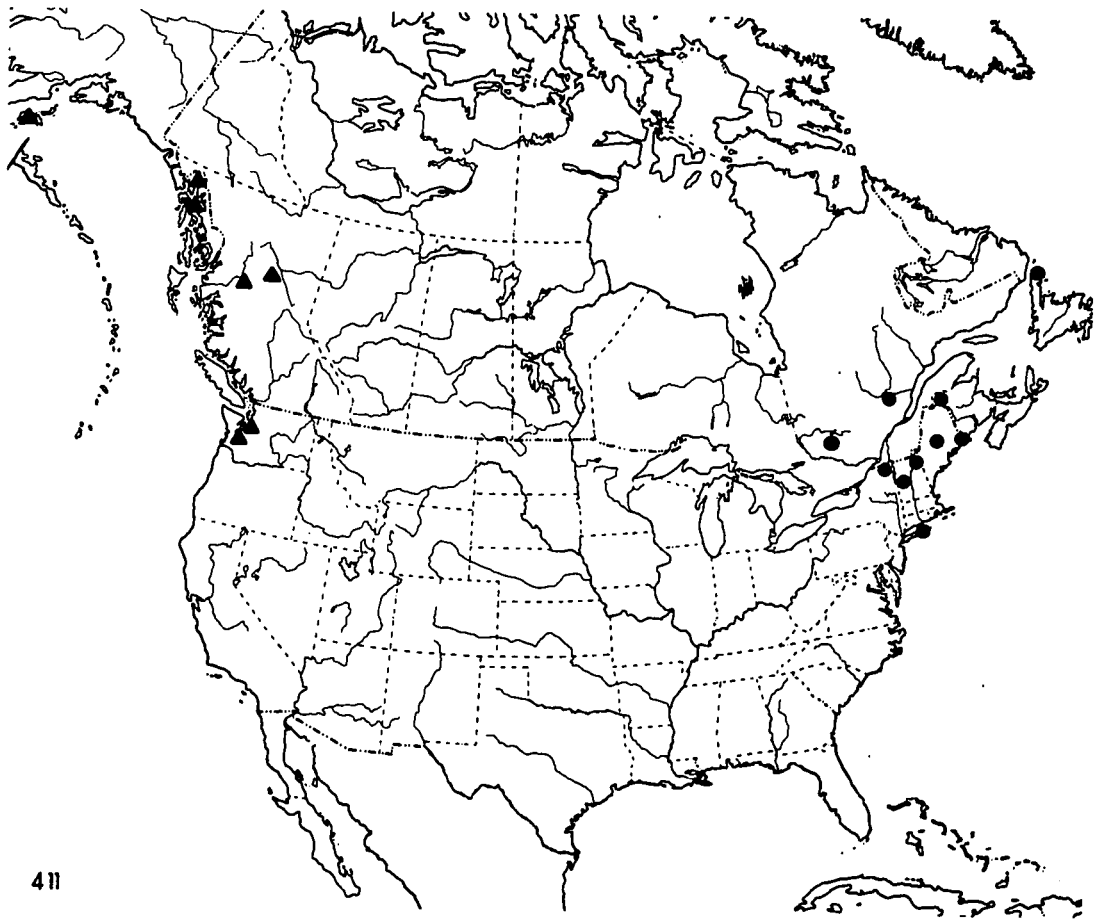
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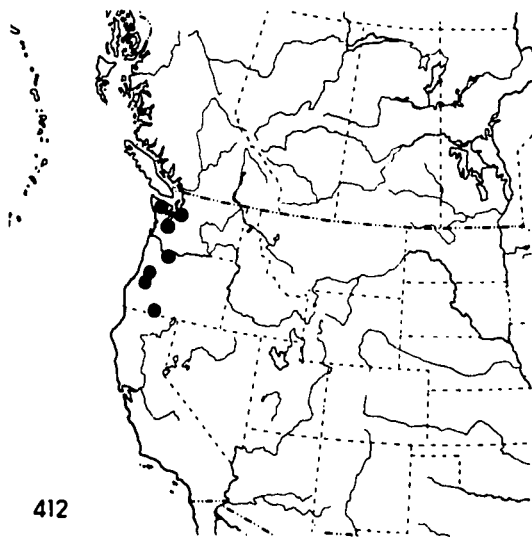
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Figs. 411 - 413.

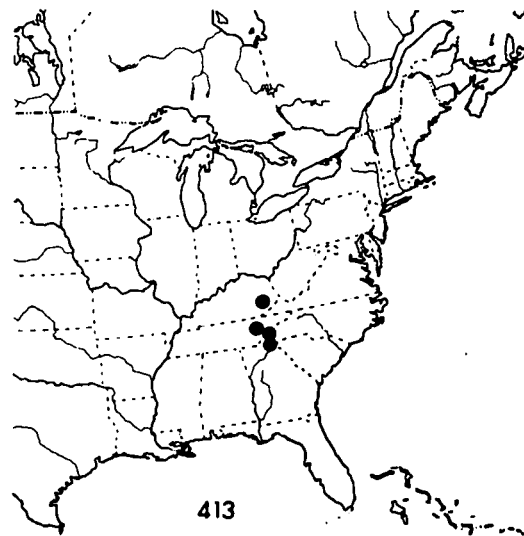
411. Geographical distribution of Callioplus tibialis (●) and Callioplus wabritaskus (▲). 412. Geographical distribution of Callioplus macarius. 413. Geographical distribution of Callioplus pantoplus.



411



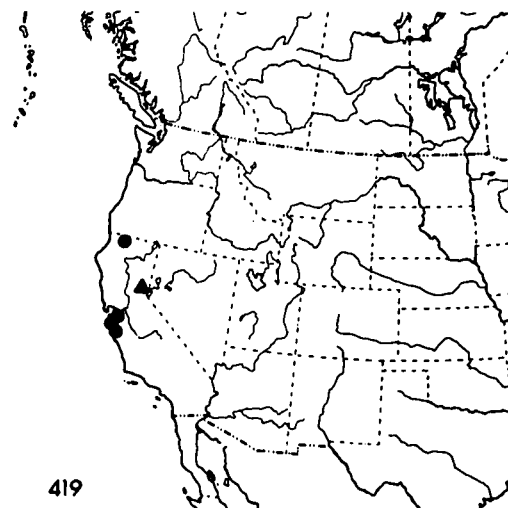
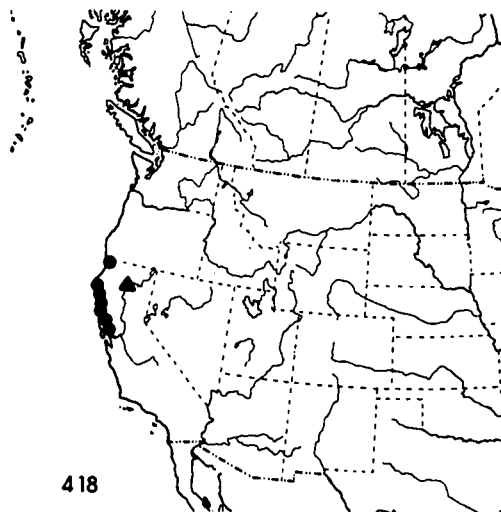
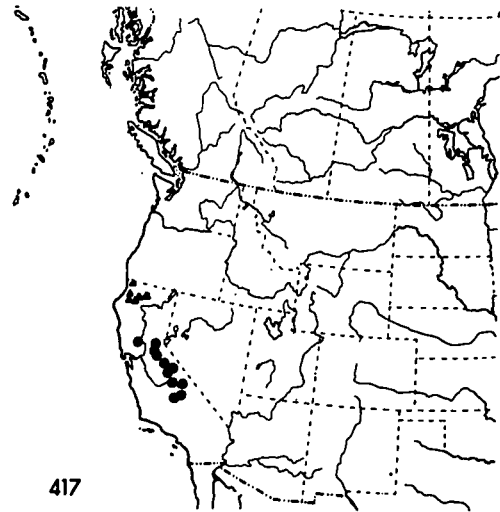
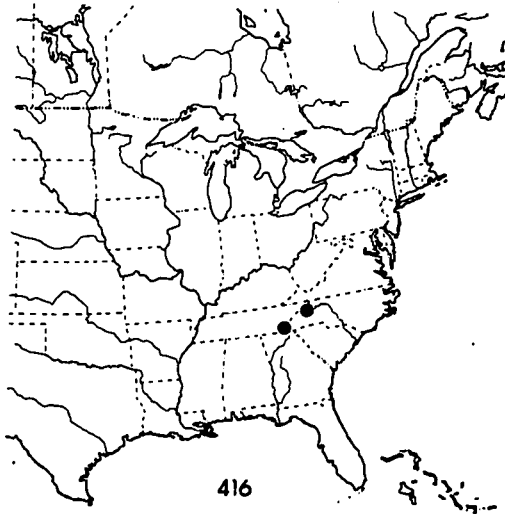
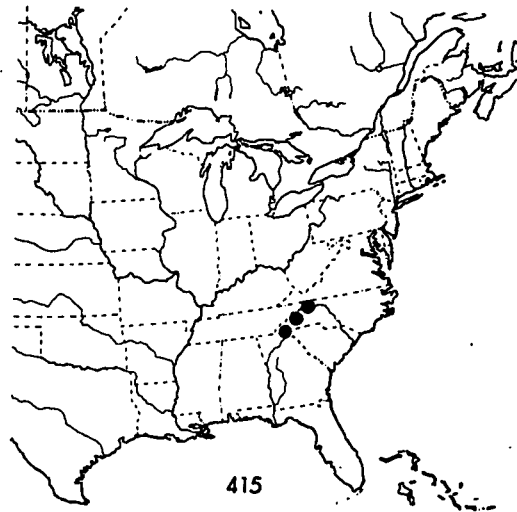
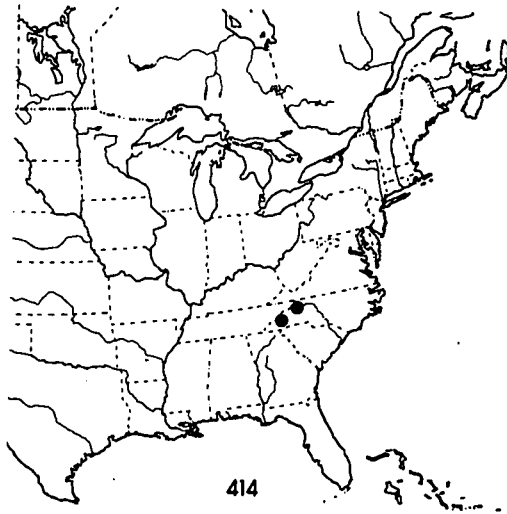
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413

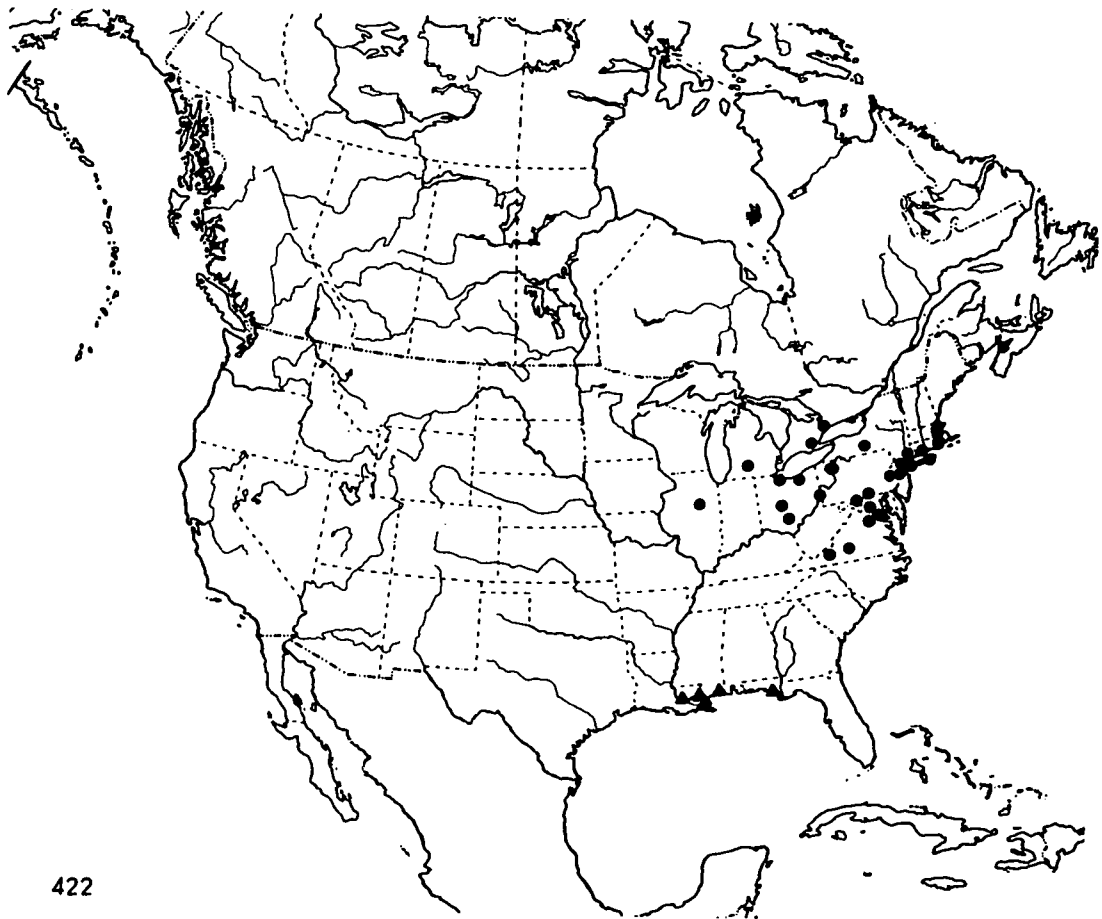
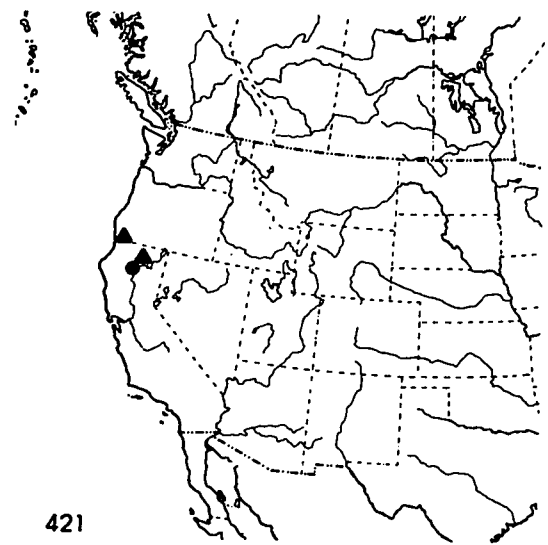
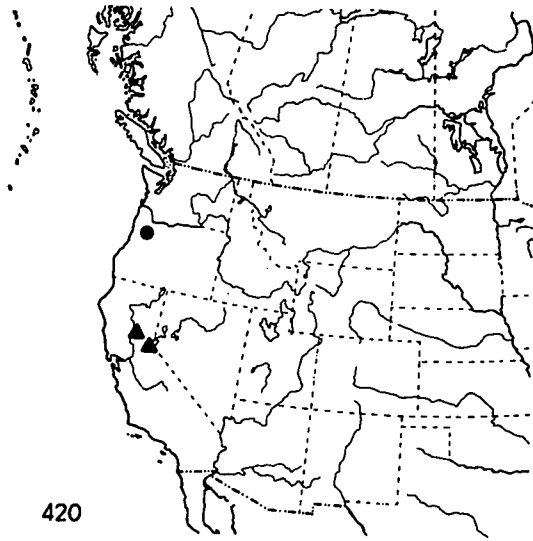
Figs. 414 - 419.

414. Geographical distribution of Callioplus hoplites. 415. Geographical distribution of Callioplus hoplomachus. 416. Geographical distribution of Callioplus armipotens. 417. Geographical distribution of Pimus pitus (●) and Pimus iviei (▲). 418. Geographical distribution of Pimus napa (●) and Pimus nawtawaketus (▲). 419. Geographical distribution of Pimus fractus (●) and Pimus desiccatus (▲).



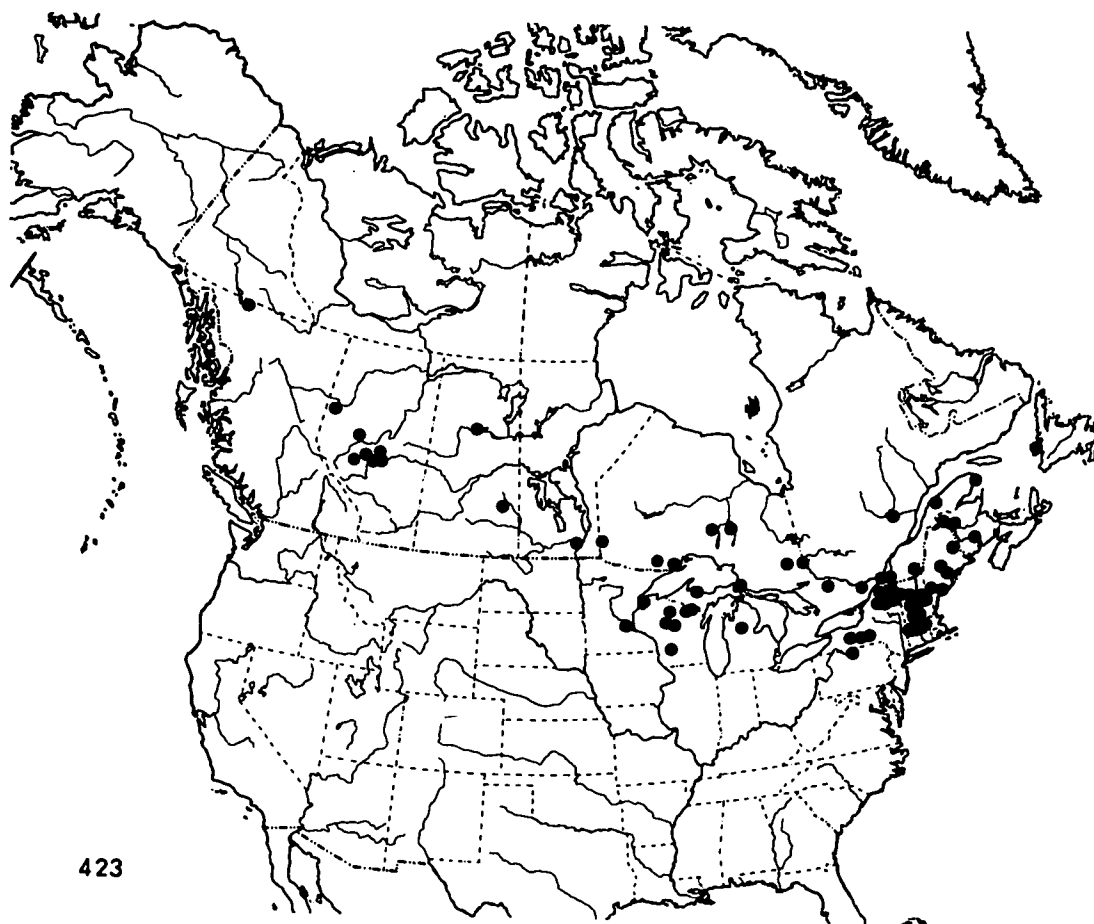
Figs. 420 - 422.

420. Geographical distribution of Pimus salemensis (●) and Pimus eldorado (▲). 421. Geographical distribution of Pimus hesperellus (●) and Pimus leucus (▲). 422. Geographical distribution of Amaurobius ferox (●) and Metaltella simoni (▲).

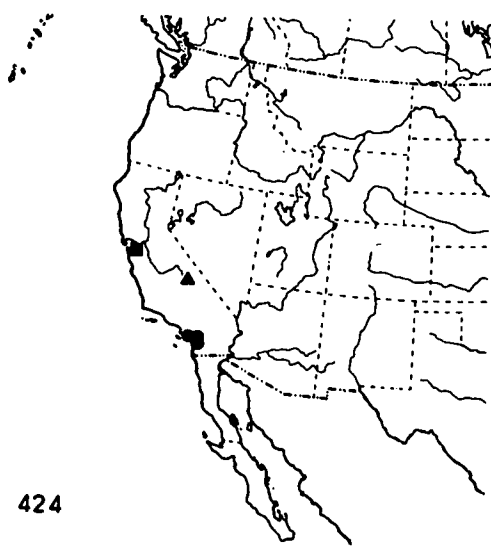


Figs. 423 - 425.

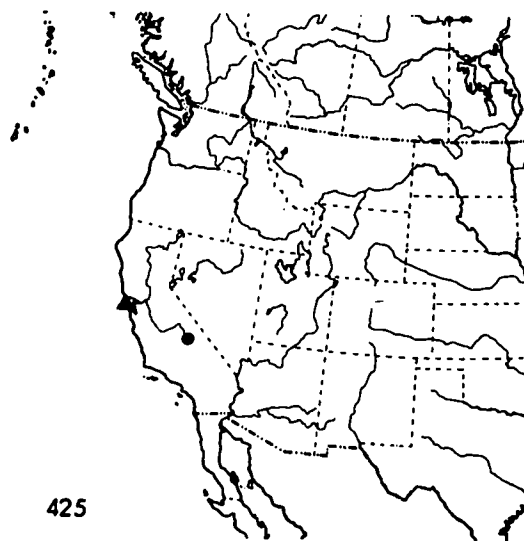
423. Geographical distribution of Amaurobius borealis. 424. Geographical distribution of Amaurobius agastus (●), Amaurobius dorotheae (▲), and Amaurobius mathetes (■). 425. Geographical distribution of Amaurobius tulare (●) and Amaurobius tamalpais (▲).



423



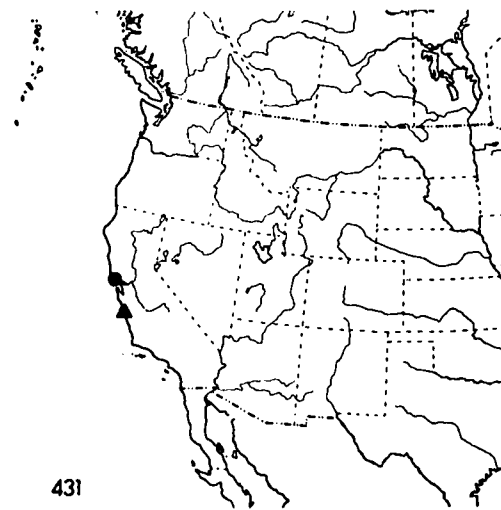
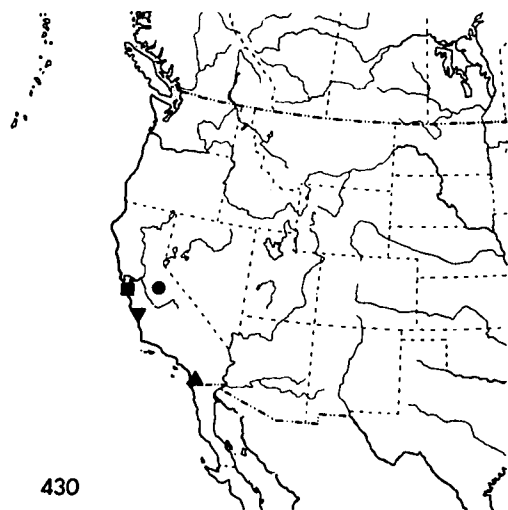
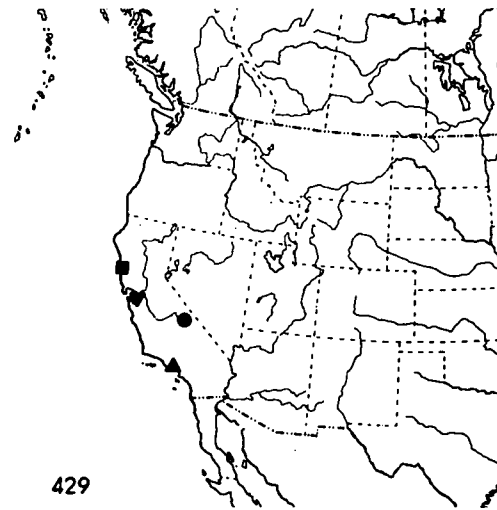
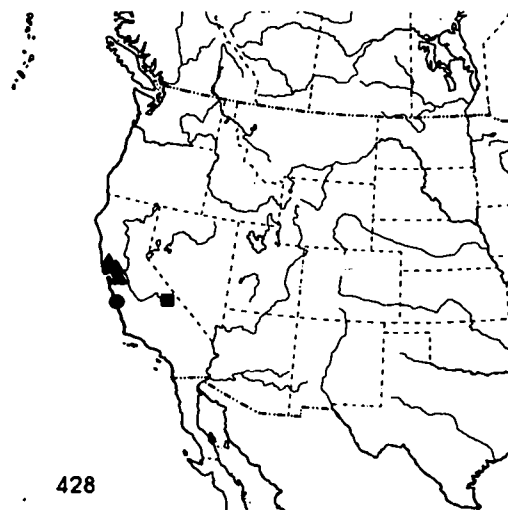
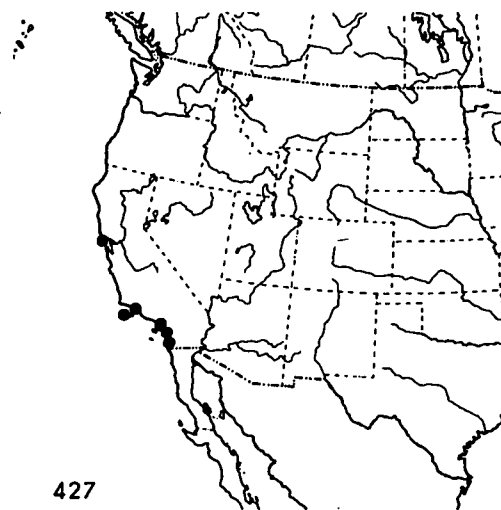
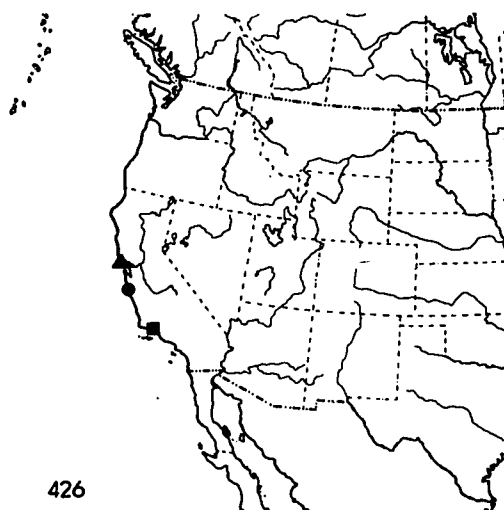
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425

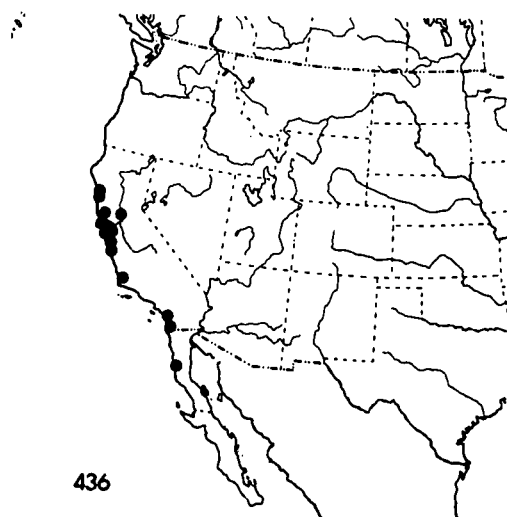
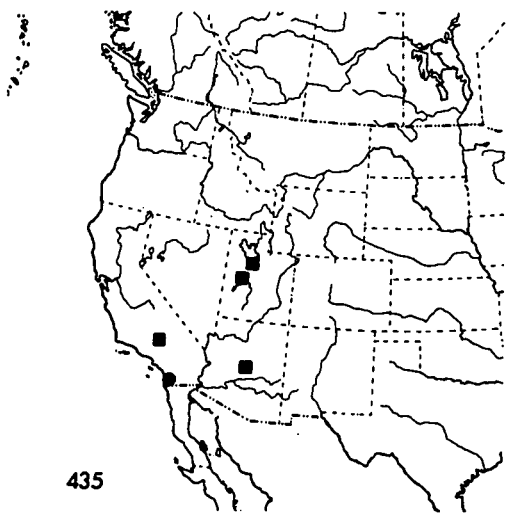
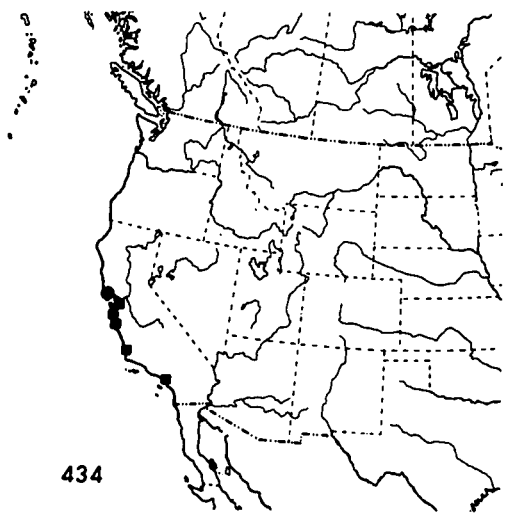
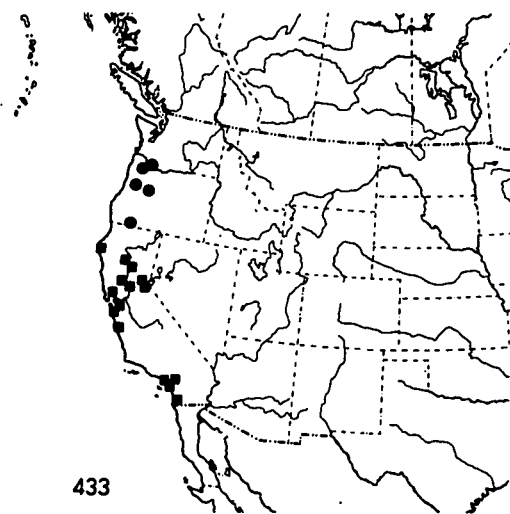
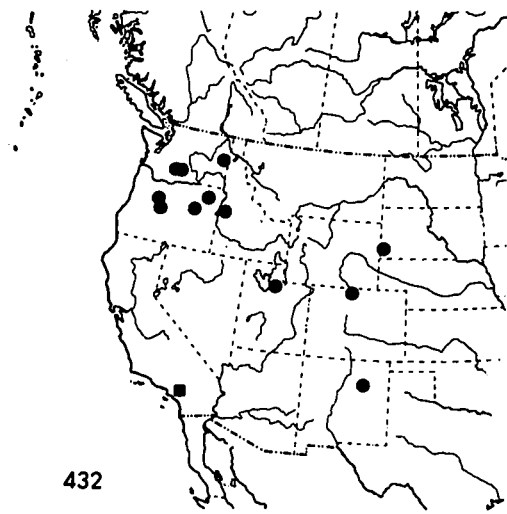
Figs. 426 - 431.

426. Geographical distribution of Amaurobius heathi (●), Amaurobius vexans (▲), and Amaurobius barbaricus (■). 427. Geographical distribution of Amaurobius latescens. 428. Geographical distribution of Amaurobius corruptus (●), Amaurobius diablo (▲), and Amaurobius distortus (■). 429. Geographical distribution of Amaurobius galeritus (●), Amaurobius hagiellus (▲), Amaurobius intermedius (■), Amaurobius mephisto (▼). 430. Geographical distribution of Amaurobius minutus (●), Amaurobius palomar (▲), Amaurobius pilosus (■), and Amaurobius transversus (▼). 431. Geographical distribution of Amaurobius triangularis (▲) and Amaurobius prosopidus (●).



Figs. 432 - 436.

432. Geographical distribution of Zanomys kaiba (●) and Zanomys sagittaria (■). 433. Geographical distribution of Zanomys aquilonia (●) and Zanomys californica (■). 434. Geographical distribution of Zanomys hesperia (●) and Zanomys ultima (■). 435. Geographical distribution of Zanomys feminina (●) and Zanomys ochra (■). 436. Geographical distribution of Ixeuticus martius.



Figs. 437 - 438.

437. Geographical distribution of Arctobius agelenoides. 438. Geographical distribution of Titanoeca nigrella (▲) and Titanoeca brunnea (●).

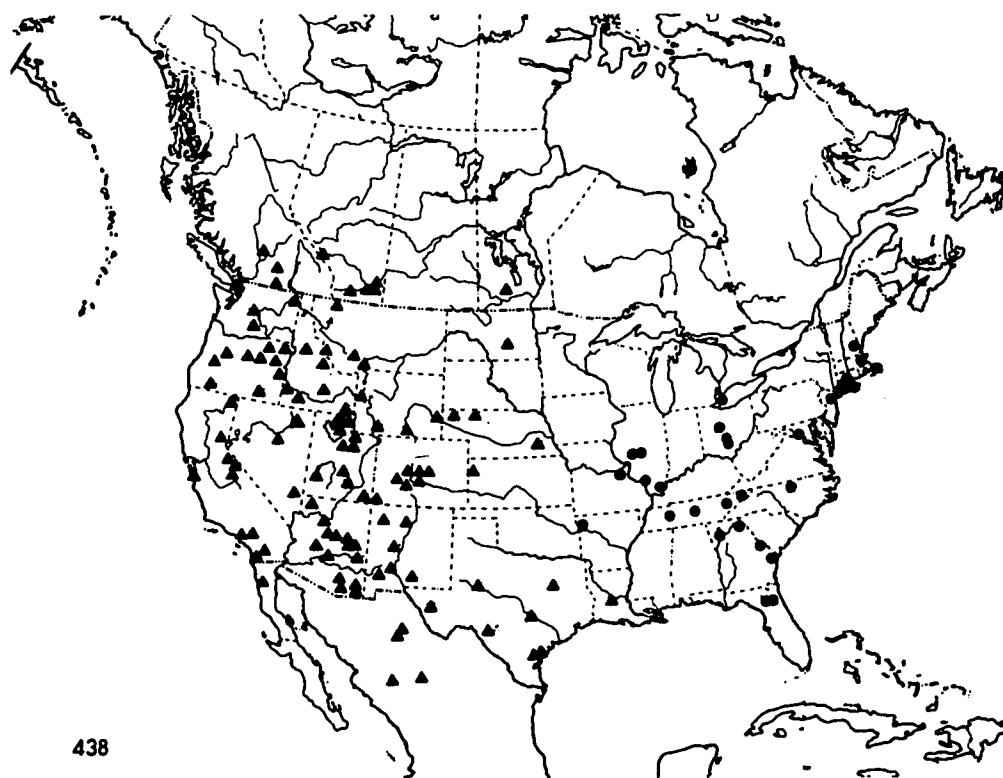
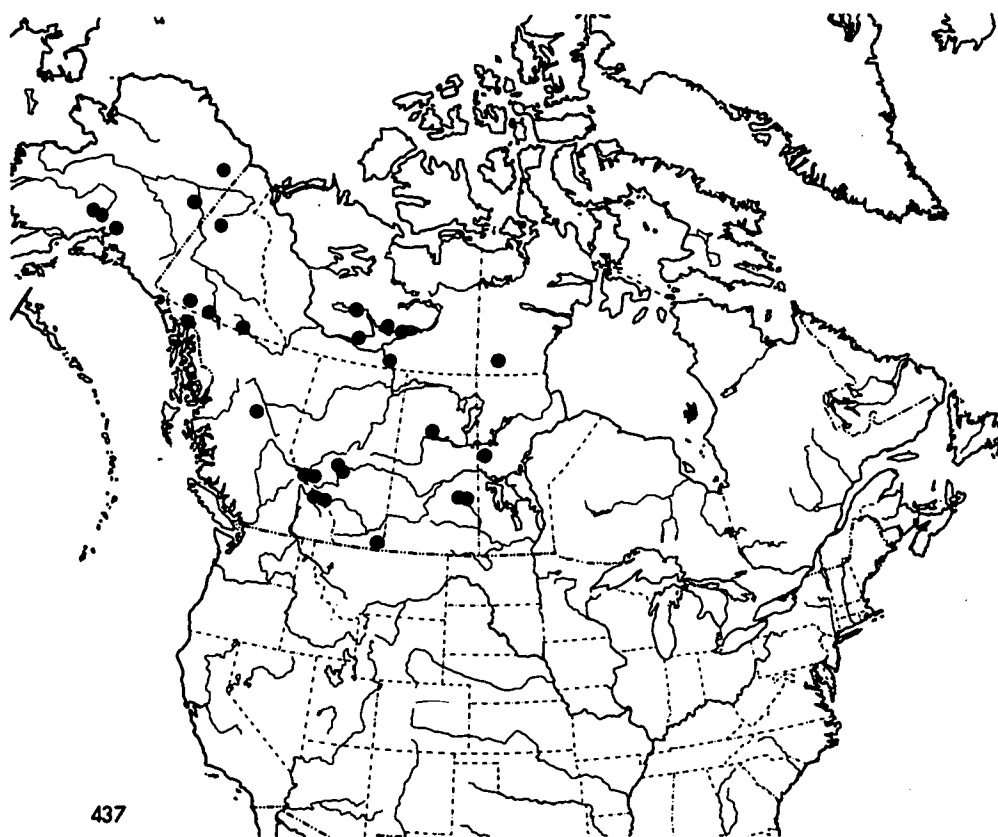


Fig. 439.

439. Geographical distribution of Titanoeca americana (●) and Titanoeca silivicola (▲).

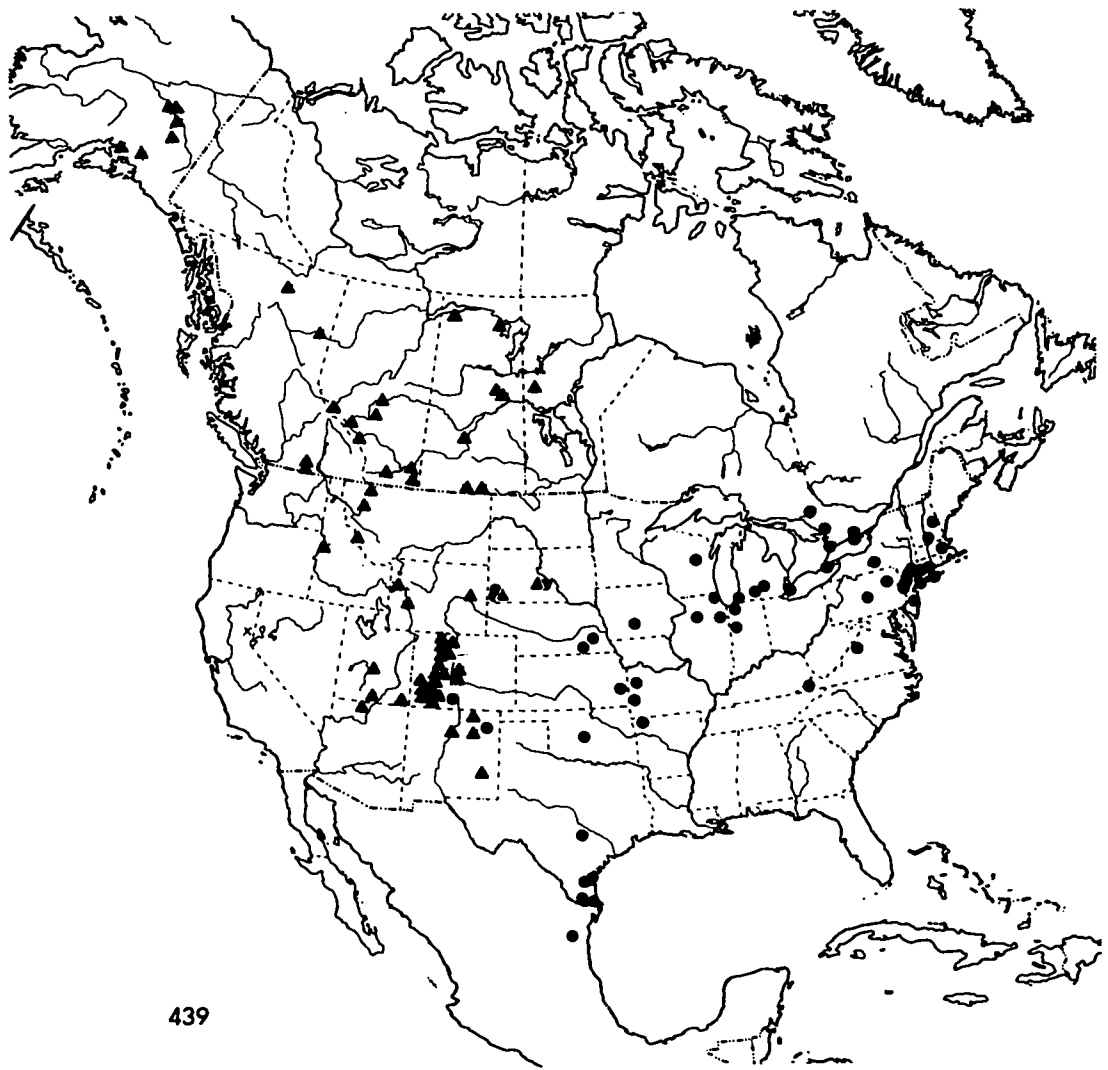
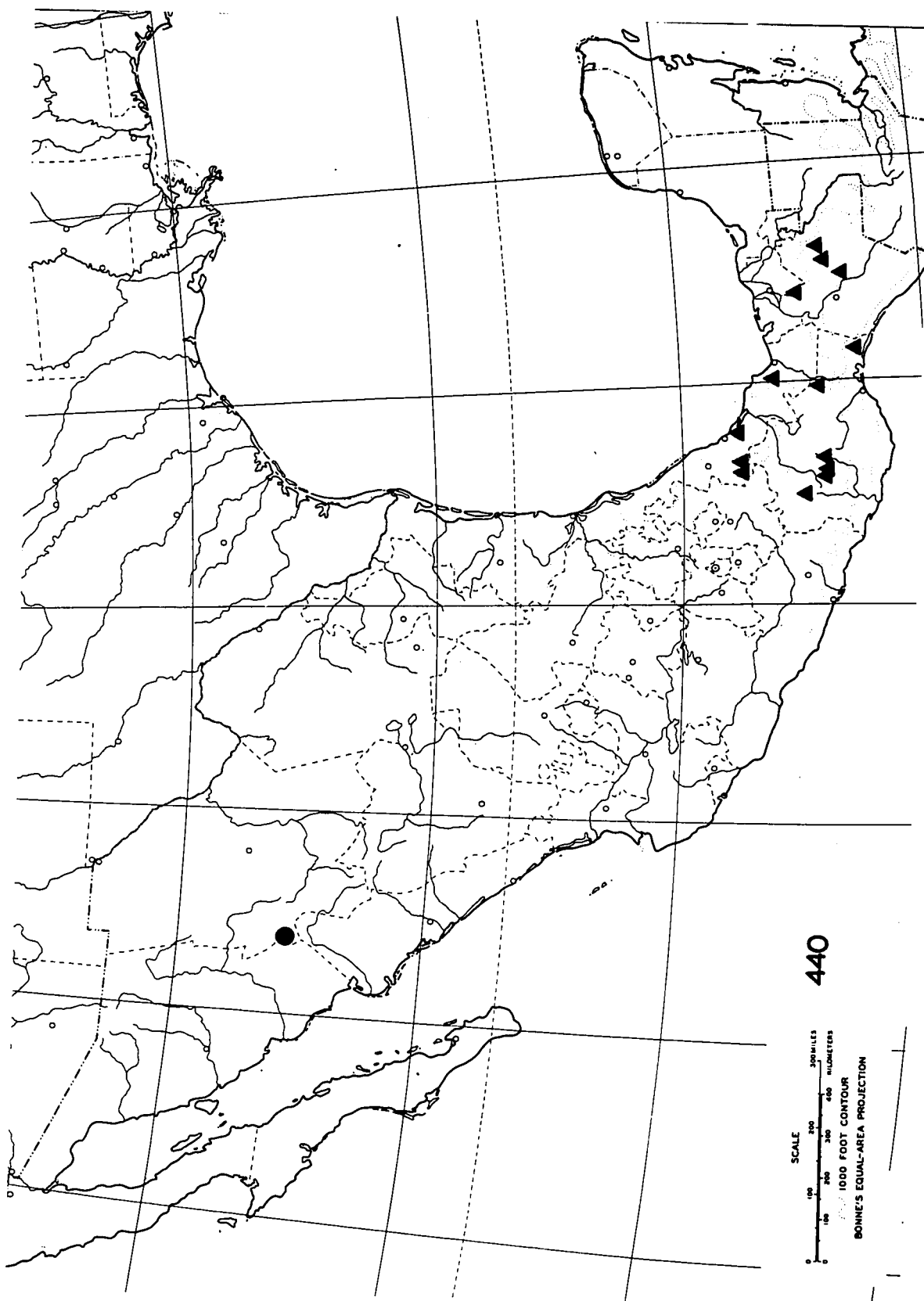


Fig. 440.

440. Geographical distribution of Goeldia chinipensis (●) and Goeldia mexicana (▲).

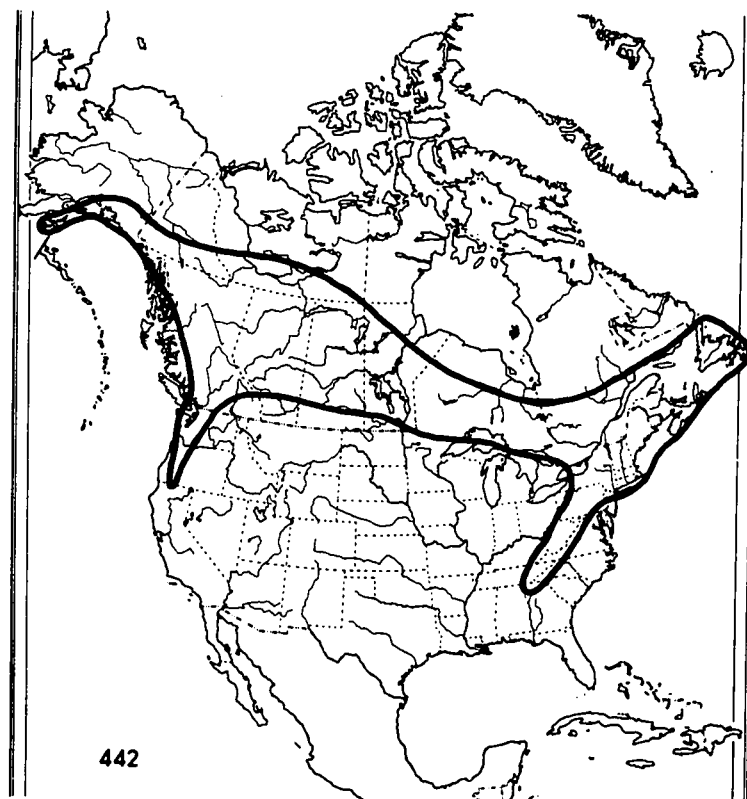
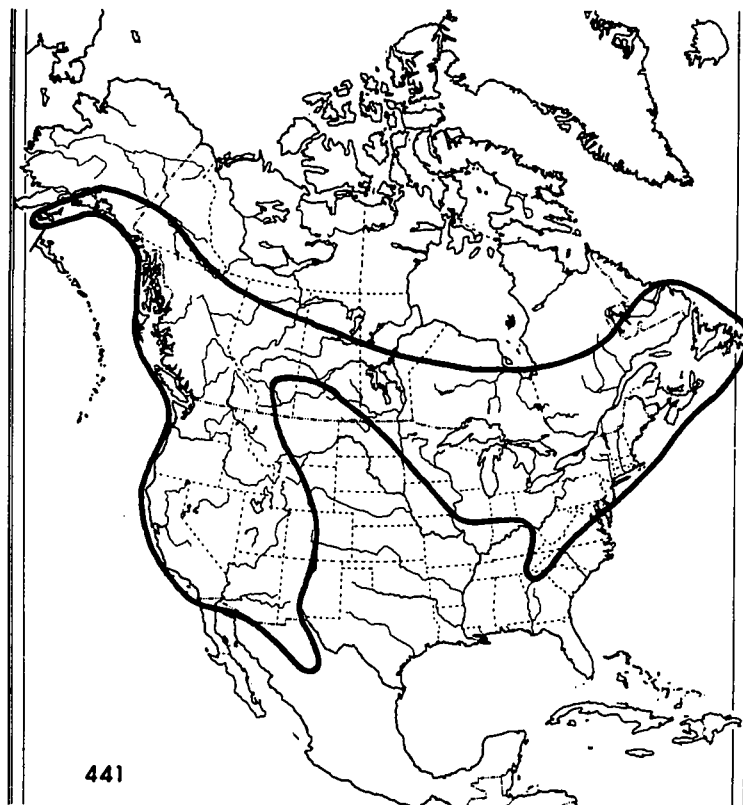


440

SCALE
0 100 200 300 MILES
0 100 200 300 KILOMETERS
1000 FOOT CONTOUR
BONNE'S EQUAL-AREA PROJECTION

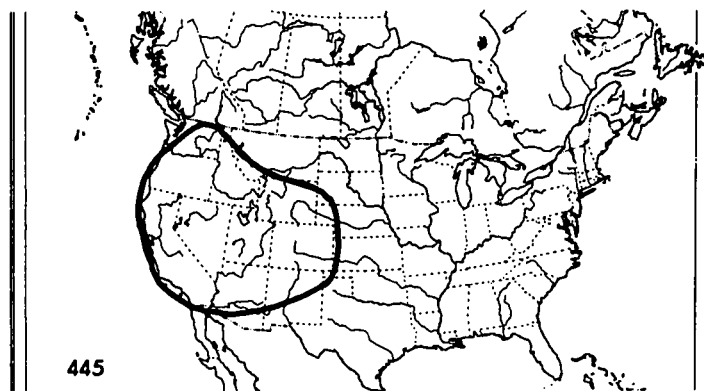
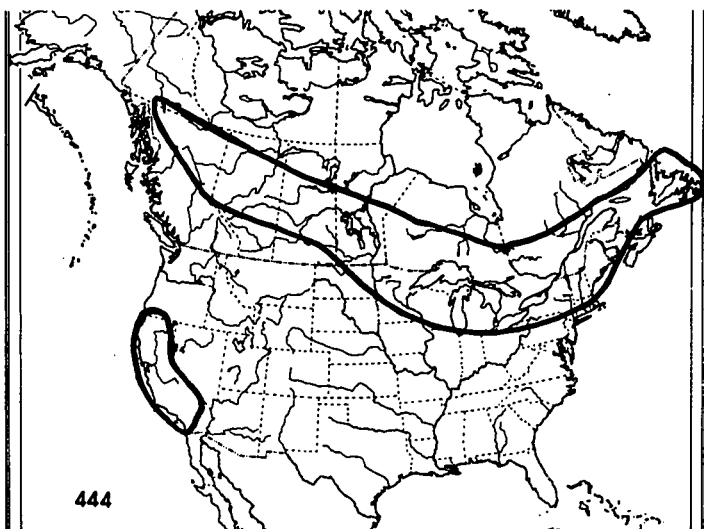
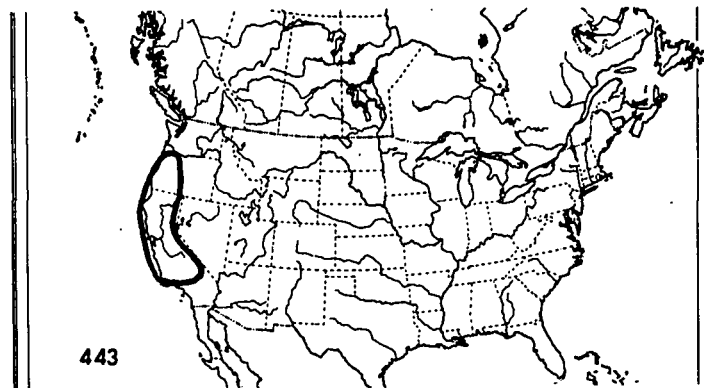
Figs. 441 - 442.

441. Geographical distribution of the genus Callobius in the Nearctic Region. 442. Geographical distribution of the genus Callioplus in the Nearctic Region.



Figs. 443 - 445.

443. Geographical distribution of the genus Pimus. 444. Geographical distribution of the genus Amaurobius in the Nearctic Region. 445. Geographical distribution of the genus Zanomys.



Figs. 446 - 448.

446. Geographical distribution of the genus Arctobius in the Nearctic Region. 447. Geographical distribution of the genus Titanoeca in the Nearctic Region. 448. Geographical distribution of the genus Goeldia in the Nearctic Region.

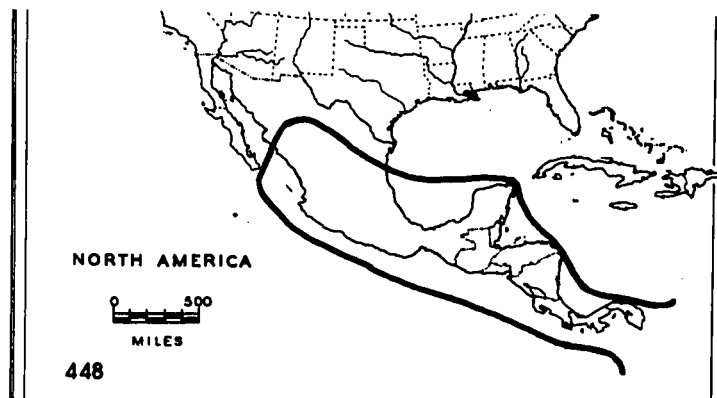
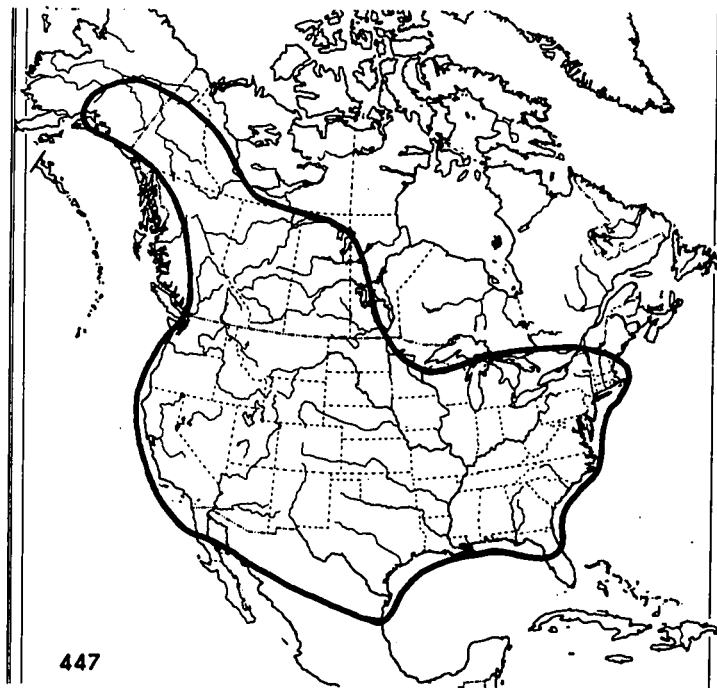
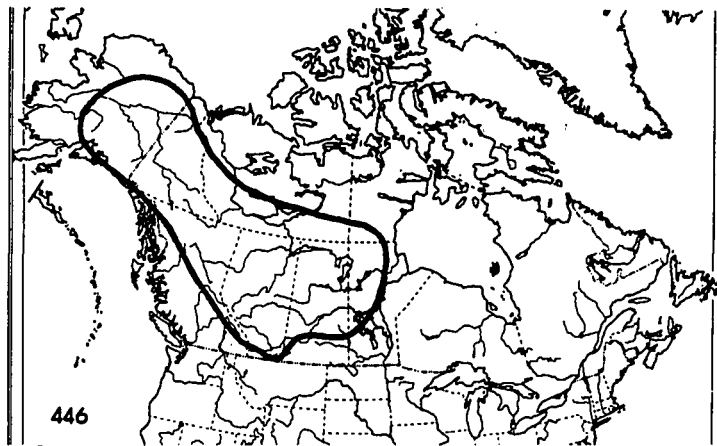


Fig. 449.

449. Number of species of amaurobiids plotted in 10° intervals throughout the Nearctic Region.

