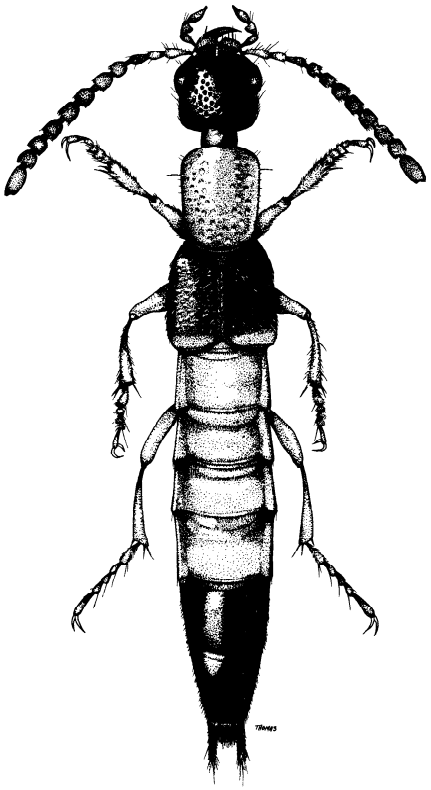
OCCASIONAL PAPERS
of the
FLORIDA STATE COLLECTION OF ARTHROPODS

Volume 1

A REVISION OF THE NEW WORLD SPECIES OF THE GENUS *NEOBISNIUS* GANGLBAUER

(COLEOPTERA: STAPHYLINIDAE: STAPHYLININAE)

BY
J. H. FRANK



FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
Doyle Conner, Commissioner

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A revision of the New World species of the genus *Neobisnius* Ganglbauer (Coleoptera: Staphylinidae: Staphylininae)[1]

by J. H. Frank[2, 3]

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FOREWORD

This is the first volume of an irregularly appearing series titled *Occasional Papers of the Florida State Collection of Arthropods*. It is intended to complement the existing irregularly appearing bulletin series titled *Arthropods of Florida and neighboring land areas* and the Entomology Circulars published monthly and distributed with *Tri-ology* by the Division of Plant Industry, Florida Department of Agriculture and Consumer Services. Like the older series, the new Occasional Papers will be concerned with the systematics, zoogeography, faunal survey, life histories, ecology, behavior, and biological control of insects and other arthropods. It will provide a forum for revisionary studies, monographs, reviews, catalogues, and other treatments pertinent to the program of the Florida State Collection of Arthropods, but which do not fall within the scope of the existing publication series. While a preference will be shown for publications dealing with groups of arthropods known to be of economic importance, the new series ultimately may encompass all groups of arthropods and is not geographically restricted.

Volume 1 is a systematic revision of the predaceous rove beetles of the genus *Neobisnius* (subfamily Staphylininae) in the New World. The predatory habits of adults and larvae of the subfamily Staphylininae (Coleoptera, Staphylinidae) have received frequent mention in economic entomological literature. Where insects, mites, or molluscs are detrimental to man's interests in agriculture, horticulture and forestry, observation has often shown that Staphylininae are his allies in destroying the pests. However, man's direct attempts to manipulate these predators to his further advantage have met with limited success for several reasons.

First, they are generally polyphagous predators, turning their attentions to whatever suitable prey is most abundant in their habitat; traditionally, biological control interests have searched for highly stenophagous natural enemies of pests. Second, their polyphagous habits include their own species when they are distributed densely in relation to suitable food; thus they are not readily amenable to *en masse* laboratory colonization, either for research or for potential release. Third, precise quantification of their population sizes and effects on prey (with variable factors of geography, season, and prey density) is time-consuming. Without such basic studies of predators already present in agro-ecosystems, there is little point in importing additional predators whose additional effect can only be surmised. Basic studies followed by habitat manipulation to augment predator populations should perhaps be the preferred method for using Staphylininae. Fourth, for many years there has been a tendency to use chemical insecticides against pests, without regard for the effect of the insecticides on such predators or on the ecological balance between predators and ANY pests within the system; for various reasons such attitudes are now changing. Fifth, and importantly, the very large number of species of Staphylininae and their often grossly inadequate taxonomic treatment have made identification difficult even for the specialist, and a sound basis for recording information on the predators has been lacking.

It is clearly desirable for integrated pest management (IPM) that taxonomic studies of Staphylininae be placed on a sounder basis with minimal delay. Although *Neobisnius* is only 1 genus of Staphylininae, it is represented in many agro-ecosystems, and, judging by the number of specimens available for study, is commonly encountered. Future studies probably will show the importance of adults and larvae of several of its species as predators of crop pests at and near the soil surface.

The author, Dr. John Howard Frank, was born in Stockton-on-Tees, England, 13 April 1942, son of George A. and Hilbre E. Frank, currently of Newcastle upon Tyne, England. In 1963 he received the Bachelor of Science degree, with honors, in zoology, from King's College, University of Durham (now University of Newcastle), and in 1967 he received the Doctor of Philosophy degree from Jesus College, Oxford University. Then followed a post-doctoral fellowship, 1966-68, at the University of Alberta, Canada. From December 1968 until March 1972 he was an entomologist with Sugar Manufacturers' Association of Jamaica, Ltd., when he accepted his present position as an entomologist with the Florida Medical Entomology Laboratory, in Vero Beach, of the Florida State Board of Health. In 1979 this laboratory was transferred administratively to the Institute of Food and Agricultural Sciences, University of Florida. In 1968 he married Audrey Lois Swanson; they have 3 children: Christine Audrey, Jocelyn Bridget, and Susan Vanessa.

In the course of his present job assignments, Dr. Frank directs 2 research programs on mosquitoes, a study of life-tables for bromeliad-inhabiting mosquitoes, of the genus *Wyeomyia* in Florida and a study of mortality factors for eggs of the black salt-marsh mosquito, *Aedes taeniorhynchus* (Wiedemann). His research interests include insect ecology, particularly predator-prey relationships and population dynamics, and the biology, ecology, and taxonomy of staphylinid beetles on which he has become a world authority. He is coauthor of 8 and author of 38 scientific publications. He is a member of the British Ecological Society, Royal Entomological Society of London, Entomological Society of Canada, Entomological Society of America, Florida Anti-Mosquito Association, Coleopterists Society, American Mosquito Control Association, Florida Entomological Society, and a Research Associate of the Florida State Collection of Arthropods.

Bureau of Entomology
Division of Plant Industry
Florida Department of
Agriculture and
Consumer Services
17 October 1980

Howard V. Weems, Jr.
Editor

ABSTRACT

Thirty-nine species of the genus *Neobisnius* are recognized from the New World. Included in this total are 5 new species (type localities in parentheses): *nothocreatus* (U.S.A., California, Calaveras Co., Mokelumne Hill), *omnirufus* (Argentina, Mendoza), *vigii* (Colombia, Magdalena, Parque Tayrona, 21 mi. E. of Santa Marta), *edznai* (Mexico, Campeche, Edzná), and *occidentoides* (U.S.A., Texas, Lake Corpus Christi State Park).

Thirteen species names (in parentheses) are newly placed as synonyms of the following 8 valid names: *villosulus* (Stephens) (=*fulvicornis* (Notman)); *terminalis* (LeConte) (= *delicatulus* (Sharp) = *adustus* (Sharp)); *ludicrus* (Erichson) (= *umbripennis* (LeConte) = *deletus* (Sharp)); *jocosus* (Horn) (= *alternans* (Sharp)); *nitidulus* (Sharp) (= *politus* (Sharp)); *sobrinus* (Erichson) (= *agnatus* (Erichson) = *ocreatus* (Horn) = *arduus* (Sharp) = *simulator* (Smetana); *simplex* (Sharp) (= *cavifrons* Bierig); *infimus* (Horn) (= *formosus* (Fall)).

N. ludicrus (Erichson) is considered to have 2 allopatric subspecies, which are *l. ludicrus* and *l. fauveli* Smetana (new status). *N. terminalis* (LeConte) likewise is thought to have 2 subspecies, which are *t. terminalis* and *t. elegantulus* (Horn) (new status). The 3 species *nigrocoeruleus* Cameron, *demmeli* Bierig, and *funerulus* Cameron are recognized as distinct from *humilis* (Erichson), and the 3 names are removed from synonymy.

Adults of all 39 valid species are described or redescribed with the aid of illustrations. Keys are provided to males from 4 regions: (1) America north of Mexico; (2) Mexico and Central America; (3) the West Indies; and (4) South America. The distribution of each species is recorded and mapped, based on specimens examined. Species are grouped according to morphological similarity of the adults, and the groups are differentiated, with their possible phylogenetic relationships discussed briefly.

INTRODUCTION

Large, lustrous black specimens of *Neobisnius* from the Jamaican Blue Mountains proved impossible to identify in keys provided by Blackwelder (1943). Closer examination of smaller, castaneous specimens of a species occurring elsewhere in Jamaica revealed that these, too, were of the genus *Neobisnius* rather than *Erichsonius* as recorded by Blackwelder (1943, 1944). I decided to examine specimens of all described West Indian species of the genera *Neobisnius* and *Erichsonius*, and to determine their distribution by looking also at material from the surrounding continental areas. After examining a large number of specimens, I undertook a revision of both genera as represented in the entire New World.

The genus *Erichsonius* apparently is restricted to America north of Mexico in the New World, and I have treated it in an earlier paper (Frank, 1975). This paper concerns only the genus *Neobisnius*, whose species are distributed from Canada to Argentina in the New World.

Neobisnius adults are facultative predators, and occur in moist macrohabitats (certain cultivated fields, and banks of rivers, lakes, marshes, etc.). Also, they are found in such microhabitats as dung and decomposing plant material, which provide humidity and prey. Adults of many, if not all, species are lucifugous diurnally, but attracted to light nocturnally, especially ultra-violet light.

MATERIAL AND METHODS

New World species of the genus *Neobisnius* have been described by Wilhelm F. Erichson, Leon Fairmaire and Philibert Germain, John L. LeConte, George Henry Horn, David Sharp, Henry C. Fall, Max Bernhauer, Malcolm Camerson, Howard Notman, Alexander Bierig, Hans Wendeler, and Aleš Smetana, in roughly chronoical sequence. Type material of the above authors was obtained where possible, and a great deal of additional material was examined. Several persons lent me material of *Neobisnius* either from their personal collections or from their institutional collections. I acknowledge their kindness with thanks. The list below gives the abbreviations used in the text for each collection and the name(s) of the individual(s) making the loans available to me:

AFNC A. F. Newton, Cambridge, Massachusetts
AMNH American Museum of Natural History; L. H. Herman
BMNH British Museum (Natural History); P. M. Hammond
CAS California Academy of Sciences; P. H. Arnaud
CNC Canadian National Collection; J. M. Campbell, A. Smetana
FMNH Field Museum of Natural History; H. Dybas, M. Prokop
FSCA Florida State Collection of Arthropods; R. E. Woodruff
IM Ian Moore, Riverside, California
INHS Illinois Natural History Survey; M. W. Sanderson
IRB Institut Royal des Sciences Naturelles de Belgique; G. Demoulin
ISZ Institut fur spezielle Zoologie und zoologishes Museum an der Humboldt-Universität; F. Hieke
JHFC J. H. Frank, private collection
MCZ Museum of Comparative Zoology, Harvard University; J. F. Lawrence, A. F. Newton, J. C. Scott
SIM Staten Island Museum, New York; material examined for me by L. H. Herman
SMKU Snow Museum, University of Kansas; P. D. Ashlock
TAMU Texas A. and M. University; H. R. Burke
UAF University of Arkansas, Fayetteville; R. T. Allen
USNM U. S. National Museum; T. L. Erwin

Approximately 3,000 adult *Neobisnius* have been examined, including type material of all but 4 of the species described from the New World. Males of all but 4 of the species have been available, and this has enabled the aedeagus of most of the species to be illustrated. The structure of the aedeagus is of primary importance in determination of groupings of species.

In place of the more usual (in North America) card points, cards of 3 × 10 mm were used to remount specimens which had been dissected. Water-soluble glue was used to fix the specimen and aedeagus securely to the card. Traditionally, gum tragacanth is used for this purpose, but I used Permapaste,* a proprietary brand whose properties include transparency, and the ability to dry without forming a "skin". This method of mounting is not only very effective in preventing damage to and loss of parts of specimens, but facilitates the preparation of drawings in 2 ways: (a) head, thorax, and abdomen are secured in the same plane and (b) the specimens are viewed against a white background.

Considerable attention has been paid to the listing of distributional records. Maps were used in deciphering the often obscure and abbreviated locality labels accompanying the material examined; any errors in so doing are entirely my responsibility. To reduce the number of printed words in listing records, the following system was used to equate the various administrative subunits of each country involved. The name of the country is given first and capitalized, followed after a colon by the name of the correct largest administrative subunit (without further definition, whether it be state, province, depart-

*Mention of a proprietary name implies no endorsement of the product.

ment, or etc.), followed after a comma by the name of the correct smaller administrative subunit if such was known, but the latter always defined as Co., Dep., Distr., or etc., followed by the name of the locality, the date of collection, particulars of the habitat, and the name of the collector. The types of subunits considered as equivalents are shown in Table 1. For example, a record exists of the occurrence of *fraternus* Bernh. from Cienega Quebrada in the department of Sarmiento in the province of La Rioja in Argentina, date of collection unspecified, at an elevation of 3,000 m, collector Weiser, initials not known, a single example in the Field Museum of Natural History; this is given as ARGENTINA: La Rioja, Sarmiento Dep., Cienega Quebrada, 3,000 m, Weiser (1:FMNH). This system is in common use by coleopterists in the U.S.A., but has seldom been extended to other countries in the same form.

Some older data labels gave very imprecise collection localities; in some cases only the name of the country of origin was stated. Some of these records, if they added nothing new to the recorded distribution, are omitted in the following account. Records given are based entirely on material I have examined, unless stated otherwise.

NEOBISNIUS GANGLBAUER

Neobisnius Ganglbauer, 1895:464; Bernhauer, 1908: 336, 1910:383, 1912:176, 1921:105, 1927:245; Bernhauer and Schubert, 1914:322; Leng, 1920:106; Notman, 1920b:705; Cameron, 1922:118; Bierig, 1933:48; Gridelli, 1943:111; Blackwelder, 1943:111, 1944:131, 1952:258; Last, 1948:148; Fagel, 1954:35; Smetana, 1955:147, 1958:134, 1963:1, 1965:10; Wendeler, 1956:230, Hatch, 1957:174; Arnett, 1961:276; Coiffait and Saiz, 1968:360; Bordoni, 1975:81.

Type species: ***Gabrius villosulus*** Stephens, 1833:251, fixed by Lucas, 1920:434.

Adult body linear, sub-cylindrical to moderately depressed; length from 3.3 to 6.5 mm (measured from base of labrum to apex of abdomen, in museum specimens, which may be contracted relative to living specimens). Head more or less quadrate, slightly expanded to quite strongly narrowed behind eyes; punctation sparse to dense, but not as dense as in some species of *Erichsonius* (e.g., *E. nanus* (Horn)); microsculpture present or absent, if present then strigulose; without infraorbital ridge; eyes moderately large and prominent, length of each between 0.30 and 0.45 of length of side of head (measured as straight line from base of labrum to nuchal constriction); head of ♂ with or without frontal fovea, defined here as circular depression on frons with setiferous punctures, and probably sensory in function; frons in both sexes with or without a longitudinal depression which, when present, is better developed in ♂ than in ♀; when both fovea and longitudinal depression are present (in ♂ of some species), then fovea occurs at anterior end of depression; labrum bilobed; antennae inserted in front of eyes, composed of 11 articles, with articles I-II broader than III, evidently so in *villosulus* species group, only slightly so in other groups, and not so distinctly broader as in species of *Erichsonius*; with distal articles IV-XI minutely pubescent; maxillary palpus of 4 articles, all elongate, last longer than penultimate and subulate; labial palpus similar to maxillary but of only 3 articles; gular sutures posteriorly parallel and close, but not united.

Pronotum longer than broad, slightly sinuate laterally or without sinuation, narrowed posteriorly or subparallel-sided; anteriorly as broad as or slightly narrower than head; surface punctate similarly to head, and with impunctate median line; with microsculpture if head microsculptured; lateral margin double with lines united just behind anterior angle; large lateral seta some

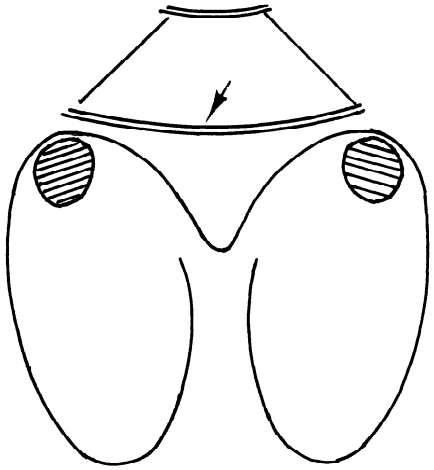


Fig. 1. Mesosternum of *Neobisnius*, showing transverse carina (arrowed).

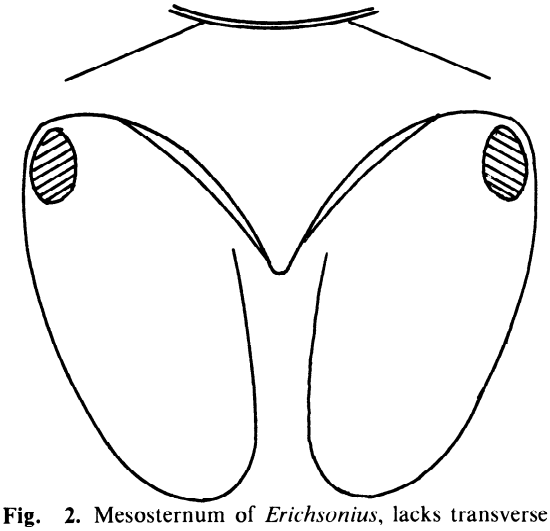


Fig. 2. Mesosternum of *Erichsonius*, lacks transverse carina.

distance removed from lateral margin; anterior coxal cavities open behind; anterior coxae large, exserted; mesosternum with transverse carina (fig. 1), contrasting with *Erichsonius* from which the carina is absent (fig. 2); mesocoxae larger, more flattened; posterior coxae almost triangular, contiguous or almost so, femora somewhat pilose but not armed with strong setae; tibiae pilose and armed with setae, those of mesotibiae most prominent; all tibiae with small ctenidium of few setae at inner edge of apex; anterior tarsi of ♂ expanded, of ♀ slightly expanded; posterior tarsus with article I shorter than article V.

Elytra wider than pronotum and abdomen to greater or lesser extent; more finely punctate than head and pronotum; equal in length to or longer than pronotum, and longer than jointly broad. Wings present.

First and 2nd abdominal sterna absent; 1st abdominal tergum weakly sclerotized, with pair of osmeteria (Sulc, 1922) (not tympanal organs (Crowson, 1963, 1970)); 2nd short, in many dried specimens hidden under elytra; abdomen more or less linear to slightly expanded toward segment VI, posteriorly narrowed to apex; terga III-VI each with anterior transverse groove, with or without coarse, dense punctures, whose diameter is greater than the distance between them, giving a tuberculate appearance and called here tuberculate punctures; intersegmental membranes of abdomen with a pattern of small, sclerotized areas in longitudinal bands; sternum VIII of ♂ with U-shaped or V-shaped notch at apex; sternum VIII of ♀ rounded. Adults of both sexes with pair of membranous, protrusible pygidial glands which evert from the intersegmental membrane behind abdominal tergum X.

Aedeagus (fig. 3) consisting of median lobe and paramere; the latter typically bifurcate and with peg setae (Hammond, 1972) near the apex of each furca, on side facing median lobe, thus not readily visible until paramere removed from median lobe. In some species (fig. 17-19) paramere is simple, not bifurcate; in some (fig. 23-25) peg setae are absent; in some (fig. 31-32) paramere is asymmetrical; in some (fig. 26-28, 48-49) paramere is reduced and fused to median lobe; when each furca has more than 4 peg setae at apex, it is normal for the number to be asymmetrical, so that 1 furca has 1 more peg seta than the other.

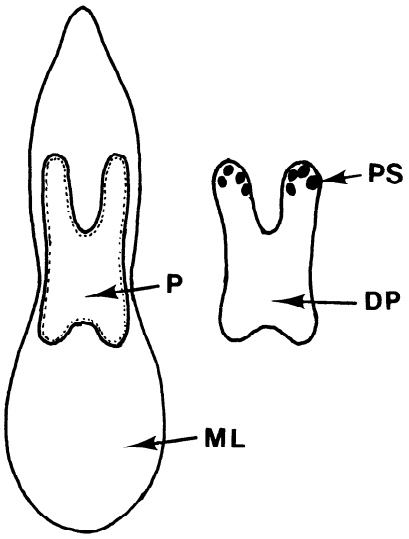


Fig. 3. Enlargement of aedeagus of *N. occidentoides* Frank, showing names of structures: ML median lobe; P paramere; DP dorsal surface of paramere; PS peg setae at apex of paramere.

Neobisnius adults have a habitus (fig. 4-16) which differs from that of *Erichsonius* (see Frank, 1975) and, in addition, may be distinguished by the presence of a transverse mesosternal carina (fig. 1 cf. fig. 2), and the different form of the aedeagus (fig. 3, 17-52 cf. Frank, 1975). Adults of some species of *Neobisnius* have article II of the antenna slightly broader than III, so that the relative widths of these articles (II is distinctly broader than III in *Erichsonius*) are not very useful for separating the genera.

Adults of the 2 genera are distinguished from those of other genera (*Cafius, Philonthus*) by the subulate form of the last article of the maxillary palpus. In common with *Cafius*, the large lateral seta of the pronotum is some distance removed from the lateral margin of the pronotum.

Adults of some species are brightly colored, with a pattern resembling that of some *Paederus* (Staphylinidae: Paederinae), called "particolored" by Horn (1884), in which the head, elytra, and abdominal segments VII-VIII, or VII alone, are piceous, but thorax and base of abdomen are flavo-rufous. Others are largely flavo-rufous, and many are various shades of reddish brown to black. In a few species intraspecific variation is considerable, so that both dark forms and pale (almost "parti-colored") forms occur, together with intermediate forms. Color is an important specific character, but intraspecific variation must be considered.

It is apparent from the changes in nomenclature proposed in this paper, that species identification has been difficult. In large measure, this difficulty has been due to attempts by most earlier authors to identify specimens by external morphology alone. Many of the external structures show a range of interspecific variation, are not of an all-or-none nature, and are difficult to quantify. For example, interspecific differences in density and coarseness of thoracic punctation are readily apparent in some interspecific comparisons, but in others are so slight as to be of no value as species characteristics. Further, the density of these punctures is not uniform on all parts of the thorax of an individual, and there is intraspecific variation. I see no merit in attempting to give a numerical index to the density of punctation, because this would be a false precision. There are too few all-or-none external characteristics to allow construction of reliable keys to all 39 species using external structure alone. In contrast, the structure of the aedeagus is a very useful specific characteristic, and I have used it extensively in the keys to species. Therefore, the keys are only for the identification of adult males. Identification of ♀ must be made by comparison with identified ♂, using external structure aided by collection data.

I know of no published descriptions of the immature stages of any species of *Neobisnius*, thus the species descriptions following refer only to adults.

Table 1. Administrative subunits (or English Language equivalents) of countries of origin of specimens.

Country	Larger subunits	Smaller subunits
Argentina	provinces and Federal district	departments
Barbados	parishes	
Bolivia	departments & Federal district	
Brazil	states, territories, and Federal district	
Canada	provinces and territories	counties and/or districts, and/or (in Quebec) territories
Chile	provinces	
Colombia	departments, intendencies and commissaries	provinces
Costa Rica	provinces	
Cuba	provinces	
Dominica	parishes	
Dominican Republic	provinces	
El Salvador	departments	
Grenada	parishes	
Guatemala	departments	
Haiti	departments	
Honduras	departments and central district	
Jamaica	counties	parishes
Mexico	states and Federal district	districts
Panama	provinces and Canal Zone	
Paraguay	departments	
Puerto Rico	districts	
St. Lucia	quarters	
St. Vincent	parishes	
Trinidad and Tobago	islands	counties
Uruguay	departments	
United States of America	states and Federal district	counties, or parishes (in Louisiana), or districts (in Alaska)
Venezuela	states, territory and Federal district	districts
Virgin Islands (U.S.)	islands	

CHECKLIST OF NEW WORLD SPECIES WITH CONCISE SYNONYMY

N. villosulus group

N villosulus (Stephens) 1833:251
  fulvicornis (Notman) 1920a:27, NEW SYNONYMY
N. lathrobioides (Baudi) 1848:130
  cerrutii Gridelli 1943:121
N. semipunctatus (Fairmaire and Germain) 1861:434

N. nothocreatus group

N. nothocreatus Frank, NEW SPECIES

N. terminalis group

N. parcepunctatus Bernhauer 1912:176
N. terminalis (LeConte) 1863:38
  elegantulus (Horn) 1884:242, NEW STATUS, SUBSPECIES
  delicatulus (Sharp) 1885:461, NEW SYNONYMY
  adustus (Sharp) 1887:790, NEW SYNONYMY

N. gratus group

N. flavomaculatus Bernhauer 1908:336
N. gratus (LeConte) 1863:38
N. paederoides (LeConte) 1863:38

N. ludicrus group

N. humilis (Erichson) 1840:512
margipallens Bernhauer and Schubert 1914:323
limbatus Cameron 1922:118
N. ludicrus (Erichson) 1840:514
umbripennis (LeConte) 1863:38, NEW SYNONYMY
deletus (Sharp) 1876:167, NEW COMBINATION, NEW SYNONYMY
fauveli Smetana 1963:2, NEW STATUS, SUBSPECIES
N. lepidulus (LeConte) 1863:38
N. flavipes Bierig 1933:50
N. mixtus (Sharp) 1885:460

N. brasilianus group

N. brasilianus Wendeler 1956:230
N. nigrocoeruleus Cameron 1922:118
carbonarius Bierig 1933:49

N. jocosus group

N. jocosus (Horn) 1884:232
alternans (Sharp) 1885:461, NEW SYNONYMY
N. armuellensis Bierig 1933:56

N. scutellaris group

N. fraternus Bernhauer 1921:105
N. scutellaris Bernhauer 1908:336
N. omnirufus Frank, NEW SPECIES

N. demmeli group

N. demmeli Bierig 1933:54

N. semirufus group

N. semirufus Bernhauer 1921:105
N. funerulus Cameron 1922:119
N. nitidulus (Sharp) 1885:460
politus (Sharp) 1885:461, NEW SYNONYMY
N. richteri Bernhauer 1927:245

N. occidentoides group

N. fortis (Sharp) 1885:457
N. facilis (Sharp) 1885:458
N. maximus Bernhauer 1920:383
N. concolor (Sharp) 1885:458
N. sobrinus (Erichson) 1840:512
agnatus (Erichson) 1840:513, NEW SYNONYMY
ocreatus (Horn) 1884:227, NEW COMBINATION, NEW SYNONYMY
arduus (Sharp) 1885:458, NEW SYNONYMY
simulator Smetana 1963:1,NEW SYNONYMY
N. simplex (Sharp) 1885:459
cavifrons,Bierig 1933:51, NEW SYNONYMY
N. vigii, Frank, NEW SPECIES
N. edznai Frank, NEW SPECIES
N. moestus (Sharp) 1887:790
N. senilis (Horn) 1884:226
N. occidentoides Frank, NEW SPECIES
N. jucundus (Horn) 1884:232
N. infimus (Horn) 1884:227, NEW COMBINATION
formosus (Fall) 1901:221, NEW SYNONYMY

nomina nuda

Philonthus gratus LeConte 1850:220
Actobius dispersus Herrera 1896:22
Neobisnius angusticeps Lüderwaldt 1917:44
Neobisnius nigritulus Scheerpeltz 1933:1327

KEYS TO SPECIES

It is suggested that the aedeagus be dissected out before beginning to use the keys. For many species, its structure provides necessary diagnostic characters. Notes follow keys A, B, and D.

A. Key to males of *Neobisnius* of America North of Mexico

1	Head without frontal fovea	2
1′	Head with frontal fovea	13
2 (1)	Head and pronotum both flavo-rufous; robust; length 5.0 mm; habitus fig. 7; aedeagus fig. 24 ..... *gratus* p. 16	
2′ (1)	Head and pronotum not both flavo-rufous	3
3 (2′)	Pronotum flavous to flavo-rufous, contrasting strongly with piceous head	4
3′ (2′)	Pronotum of similar color to head	9
4 (3)	At least apical 0.4 of elytra flavo-rufous or flavous, remainder piceous	5
4′ (3)	Not more than apical 0.15 of elytra flavo-rufous, remainder piceous or dark castaneous	6
5 (4)	Basal 0.6 of elytra piceous, remainder flavo-rufous, habitus fig. 6; aedeagus fig. 22 ..... *terminalis terminalis* p. 13	
5′ (4)	Piceous area of elytra restricted to a lateral spot on each elytron, remainder flavous ..... *terminalis elegantus* p. 13	
6 (4′)	Abdominal segments VII-VIII piceous, contrasting strongly with remaining flavo-rufous segments	7
6′ (4′)	Abdominal segments unicolorous	8
7 (6)	Length 5.0 mm or less; sides of head rounded; basal 0.25 of abdominal tergum VII rufous; aedeagus fig. 25 .. .. *paederoides* p. 17	
7′ (6)	Length 5.0 to 5.5 mm; head parallel-sided abdominal tergum VII entirely	

piceous; habitus fig. 10; aedeagus fig. 31 ..... *jocosus* p. 27

8 (6′) Head with strigulose microsculpture; from California; habitus fig. 5; aedeagus fig. 20 .... pale form of *nothocreatus* p. 11

8′ (6′) Head without strigulose microsculpture; from southeastern U.S.A.; habitus fig. 8; aedeagus fig. 27 .... *ludicrus ludicrus* p. 20

9 (3′) Head with strigulose microsculpture, not shining 10

9′ (3′) Head without strigulose microsculpture, shining 12

10 (9) Head narrowed behind eyes; habitus fig. 5; aedeagal paramere bifurcate, fig. 20 ..... dark form of *nothocreatus* p. 11

10′ (9) Head parallel-sided; aedeagus simple, fig. 17, 18 11

11 (10′) More depressed; more sparsely punctate; antennal articles pale, as legs; habitus fig. 4; aedeagus fig. 17 .... *villosulus* p. 8

11′ (10′) More cylindrical; more densely punctate; antennal articles III-XI infuscate; aedeagus fig. 18 ... *lathrobioides* p. 9

12 (9′) Length 3.3 mm; very sparsely punctate; shining; head strongly narrowed behind eyes ..... *lepidulus* p. 23

12′ (9′) Length 4.0-4.2 mm; moderately punctate; head not strongly narrowed behind eyes; habitus fig. 8; aedeagus fig. 27 ..... *ludicrus fauveli* p. 20

13 (1′) Pronotum flavo-rufous or pale castaneous, contrasting strongly with piceous head 14

13′ (1′) Pronotum and head colored similarly, dark castaneous or piceous 17

14 (13) Flavescent apical margin of elytra occupying 0.12-0.25 of length of elytra; length 4.8-5.2 mm; eye small, slightly more than 0.3 length of side of head; aedeagus fig. 52 with only 2 peg setae at apex of each furca .... pale form of *infimus* p. 52

14′ (13) Flavescent apical margin of elytra narrower, less than 0.1 of length of elytra; if eye only 0.3 length of side of head then body length not more than 4.3 mm; at least 4 peg setae per furca 15

15 (14′) Eye large, occupying almost 0.5 length of side of head; habitus fig. 16; aedeagus fig. 3 ..... *occidentoides* p. 47

15′ (14′) Eye small, occupying not more than ca. 0.3 length of side of head 16

16 (15′) Length 3.5-3.7 mm; aedeagus fig. 51, strap-shaped with small paramere ..... *jucundus* p. 51

16 (15′) Length 4.0-4.3 mm; aedeagus fig. 50, not strap-shaped, paramere of moderate size ..... pale form of *senilis* p. 45

17 (13′) Length 4.0-4.3 mm; head and pronotum very densely punctate; form subcylindrical; aedeagus fig. 50 .... dark form of *senilis* p. 45

17′ (13′) Length 4.7-5.5 mm; head and pronotum moderately punctate; form less cylindrical to depressed 18

18 (17′) Flavescent apical margin of elytra occupying 0.12-0.25 of length of elytra; form depressed; aedeagus fig. 52 .. .. dark form of *infimus* p. 52

18′ (17′) If apical margin of elytra distinct, then narrow; form not depressed; aedeagus fig. 45 ..... *sobrinus* p. 39

note: 1) *N. lepidulus* is included in the key under the assumption that a frontal fovea is absent.

B. Key to males of *Neobisnius* of Mexico and Central America

1 Head without frontal fovea 2

1′ Head with frontal fovea 8

2 (1) Head and pronotum flavo-rufous; habitus fig. 7; aedeagus fig. 24 .... *gratus* p. 16

2′ (1) Head and pronotum not both flavo-rufous 3

3 (2′) Length 5.0 mm or more, body broad; "parti-colored"; paramere asymmetrical 4

3′ (2′) Length 4.5 mm or less; body slender; paramere symmetrical 5

4 (3) Abdominal segments VII-VIII piceous contrasting with flavo-rufous segments II-VI; habitus fig. 10; aedeagus fig. 31 ..... *jocosus* p. 27

4′ (3) Abdominal segment VII piceous, contrasting with flavo-rufous segments II-VI and VIII; aedeagus fig. 32 .. .. *armuellensis* p. 28

5 (3′) Pronotum slender, elytra markedly broader than it and abdomen; habitus fig. 6; aedeagus fig. 22 .... *terminalis* p. 13

5′ (3′) No strong contrast between width of pronotum, elytra and abdomen; habitus fig. 8 6

6 (5′) Aedeagus acute at apex, fig. 28 .... *mixtus* p. 24

6′ (5′) Aedeagus broad and rounded at apex, fig. 27 7

7 (6′) Body dark .... dark form of *ludicrus* p. 20

7′ (6′) Flavo-rufous pronotum contrasting with dark head ..... *ludicrus ludicrus* p. 20

8 (7′) Elytra together as broad as long; head and pronotum very sparsely punctate; aedeagus fig. 39 ..... *nitidulus* p. 34

8 7′) Elytra together longer than broad 9

9 (8′) Elytra with broad, flavescent apical margin, 0.12-0.25 length of elytra; aedeagus fig. 52 ..... *infimus* p. 52

9′ (8′) Elytra at most with narrow, flavescent apical margin 10

10 (9′) Abdominal segments VII-VIII piceous, contrasting strongly with flavo-rufous segments II-VI; habitus fig. 16; aedeagus fig. 3 ..... *occidentoides* p. 47

10′ (9′) Abdominal segments unicolorous or almost so 11

11 (10′) Length 4.0-4.3 mm and legs entirely flavous; densely punctate; habitus fig. 15; aedeagus fig. 49 with paramere fused to median lobe .... *edznai* p. 44

11′ (10′) If less than 4.7 mm, then legs dark (tibiae of most individuals dark) ... 12

12 (11′) Length 4.0-4.3 mm; legs entirely dark; pronotum very densely punctate; aeddeagus fig. 50 ..... *senilis* p.

12′ (11′) Length 5.0 mm or more, or legs at least in part flavous, or pronotum not very densely punctate 13

13 (12′) Apex of median lobe of aedeagus acute fig. 47 ..... *simplex* p. 42

13′ (12′) Apex of median lobe of aedeagus not acute, fig. 41-46 14

14 (13′) Length 6.5 mm 15

14′ (13′) Length 5.7 mm or less 16

15 (14) Hind tibia 0.2 longer than hind tarsus; femora obscurely infuscate; aedeagus fig. 41 ..... *fortis* p. 36

15′ (14) Hind tibia equal in length to hind tarsus; femora bright flavous; aedeagus fig. 42 ..... *facilis* p. 37

16 (14′) Length 5.7 mm; abdomen rufo-ferruginous; microsculpture of head and pronotum scarcely evident; aedeagus fig. 43 ..... *maximus* p. 37

16′ (14) Length 4.7-5.7 mm; abdomen castaneous to piceous; if approaching 5.7 mm, then strigulose microsculpture present 17

17 (16′) Larger 5.0-5.7 mm; head of some examples massive, quadrate; strigulose microsculpture evident; aedeagus fig. 44 ..... *concolor* p. 38

17′ (16′) Smaller, 4.7-5.5 mm; head not massive, in some examples narrowed behind eyes; microsculpture scarcely evident; aedeagus fig. 45-46 .... *sobrinus* p. 39

note: 1) The separation of *sobrinus*, and *maximus* is unsatisfactory, but see text. *N. concolor* is not known to occur outside of the province of Chiriqui (Panama), nor *maximus* outside the state of Veracruz (Mexico).

2) *N. flavipes* is excluded from the key because it has not been distinguished from dark examples of *ludicrus* (key couplet 7), see text.

3) *N. moestus* is excluded from the key because the condition of the frontal fovea, and structure of the aedeagus, are unknown. If frontal fovea occurs, examples should key to couplet 12, otherwise to couplet 6.

4) *N. infimus* is included in the key because it is known from California, and it may be present in northwestern Mexico.

C. Key to males of West Indian *Neobisnius*

1 Entire body nigrous with slight bluish luster; aedeagus fig. 30 .... *nigrocoeruleus* p. 26

1′ Body not at all nigrous 2

2 (1′) Head with frontal fovea; aedeagus fig. 38 ..... *funerulus* p. 34

2′ (1′) Head without frontal fovea 3

3 (2′) Elytra maculate and paler at anterior angles; aedeagus fig. 23 .... flavomaculatus p. 15

3′ (2′) Elytra not maculate, not paler at anterior angles 4

4 (3′) Depressed; eye small, occupying 0.3 length of side of head (known only from mountains in Cuba); habitus fig. 13 aedeagus fig. 36 .... *demmeli* p. 32

4′ (3′) Not depressed; eye occupying 0.4 length of side of head 5

5 (4′) Head and pronotum closely punctate and more or less unicolorous (from Greater Antilles); aedeagus fig. 26 . ..... *humilis* p. 18

5′ (4′) Head and pronotum sparsely punctate, pronotum much paler than head (from southern Lesser Antilles); habitus fig. 8; aedeagus fig. 27 .... *ludicrus* p. 20

D. Key to males of South American *Neobisnius*

1 Head with frontal fovea 2

1′ Head without frontal fovea 7

2 (1) Head and pronotum flavo-rufous; habitus fig. 14; aedeagus fig. 37 .... *semirufus* p. 33

2′ (1) Head castaneous to piceous, pronotum as dark or paler 3

3 (2′) Aedeagus fig. 48, with paramere simple and fused to median lobe .... *vigii* p. 43

3′ (2′) Aedeagus fig. 40, 41, 45, 47, with paramere bifurcate and articulated to median lobe 4

4 (3′) Elytra markedly broader and darker than pronotum and abdomen; aedeagus fig. 40 ..... *richteri* p. 35

4′ (3′) Elytra not markedly broader, not darker, than pronotum and abdomen 5

5 (4′) Length 6.5 mm, coarsely punctate; nigro-piceous; aedeagus fig. 41 .... *fortis* p. 36

5′ (4′) Length 5.5 mm or less; not coarsely punctate; not so dark 9

6 (5′) Aedeagus acute at apex, fig. 47 .... *simplex* p. 42

6′ (5′)	Aedeagus obtuse at apex, fig. 45 .... *sobrinus* p. 39	
7 (1′)	"Parti-colored" with abdominal segment VII piceous and contrasting strongly with remaining flavo-rufous segments; aedeagus fig. 32, with asymmetrical paramere ..... *armuellensis* p. 28	
7′ (1′)	Not "parti-colored", or if almost so then abdominal segments unicolorous; aedeagal paramere symmetrical 8	
8 (7′)	Head and pronotum piceous to nigrous 9	
8′ (7′)	Head and pronotum flavo-rufous to brunneous 10	
9 (8)	Length 4.0-4.2 mm; length of eye 0.75 of distance behind eye; aedeagus fig. 33 ..... *fraternus* p. 29	
9′ (8)	Length 6.0 mm; length of eye equal to distance behind eye; habitus fig. 9; aedeagus fig. 29 ..... *brasilianus* p. 25	
10 (8′)	Elytra markedly broader than pronotum and abdomen much as in fig. 6; head broader and rounder behind eyes; ..... *parcepunctatus* p. 12	
10′ (8′)	Elytra scarcely broader than pronotum and abdomen; head narrowed behind eyes 11	
11 (10′)	Entire body unicolorous or almost so 12	
11′ (10′)	Elytra bicolored, at least in part darker than pronotum 13	
12 (11)	Entire body flavo-rufous; habitus fig. 12; aedeagus fig. 35 .... *omnirufus* p. 31	
12′ (11)	Entire body brunneous; aedeagus fig. 19 ..... *semipunctatus* p. 10	
13 (11′)	Elytra with pale apical margin only; habitus fig. 8; aedeagus fig. 27 .... *ludicrus* p. 20	
13′ (11′)	Elytra with additional pale markings 14	
14 (13′)	Elytra paler at anterior angles; aedeagus fig. 23 .... *flavomaculatus* p. 15	
14′ (13′)	Elytra with pale area posterior to scutellum; habitus fig. 11; aedeagus fig. 34 ..... *scutellaris* p. 30	
note: 1)	I expect that the South American fauna includes a number of undescribed species of *Neobisnius*. The key nevertheless serves to identify the known species provided that the aedeagi of specimens to be identified are compared with the illustrations given.	

SPECIES DESCRIPTIONS

N. villosulus group

DIAGNOSIS: Head of ♂ without frontal fovea; paramere of aedeagus entire (fig. 17-19); strigulose microsulpture of head and pronotum evident; anterior transverse depressions of terga III-VI without tuberculate punctures; color entirely reddish brown.

1. *Neobisnius villosulus* (Stephens)

(fig. 4, 17, map 1)

Gabrius villosulus Stephens, 1833:251 (type locality: England).
Erichsonius villosulus (Stephens); Fauvel, 1874:430.
Actobius villosulus (Stephens); Fauvel, 1876:72.
Neobisnius villosulus (Stephens); Ganglbauer, 1895:464; Scheerpeltz, 1933:1328; Gridelli, 1943:119; Last, 1948:149; Smetana 1955:147, 1958:135; Lohse, 1964:171.

Actobius fulvicornis Notman, 1920a:27 (type locality: U.S.A., New York, Schoharie Co., Schoharie); Leng and Mutchler, 1927:21. **NEW SYNONYMY.**

TYPES: I have not seen the type of *Gabrius villosulus*, which is in the British Museum (Natural History) fide P. M. Hammond (*in litt.*). Holotype ♀ of *Actobius fulvicornis* in Staten Island Museum with label: Schoharie, Schoharie Co., New York, 10-VI-1918, H. Notman. The holotype and 2 other specimens in Notman's collection were kindly examined for me by Lee H. Herman, who compared them with examples of *villosulus*, *lathrobioides*, and *sobrinus* identified by me. He informed me that he believed the *Actobius fulvicornis* holotype to be conspecific with the examples of *villosulus*.

DESCRIPTION: Length 3.7-4.2 mm. Head, pronotum, and scutellum piceo-castaneous to piceous; elytra rufo castaneous to piceo-castaneous, without pale apical margin; terga II-VI piceo-castaneous with apical margin narrowly rufescent, tergum VII with apical margin more broadly rufescent; tergum VIII rufo-castaneous; labrum, trophi, legs, and antenna entirely ferruginous.

Head quadrate, as broad at hind angles as across eyes; eye equal to 0.3 length of side; head of ♂ with elongate, shallow frontal depression (but without distinct circular fovea); punctures coarse, not dense; with distinct, strigulose microsculpture between punctures. Pronotum elongate, not much narrowed posteriorly; slightly sinuate laterally; punctate and sculptate similarly to head. Elytra not much broader than head or abdomen; longer than jointly broad; slightly broader posteriorly; much more finely and densely punctate than pronotum. Abdomen slightly broadened to segment VI; punctate similarly to elytra; apical notch of sternum VIII of ♂ very shallow. Articles I, II of antenna distinctly broader than III; articles VII-X of antenna transverse; none of articles of middle or hind tarsus more than twice as long as broad. Aedeagus with short, undivided, tapering paramere with 4 apical peg setae (fig. 17).

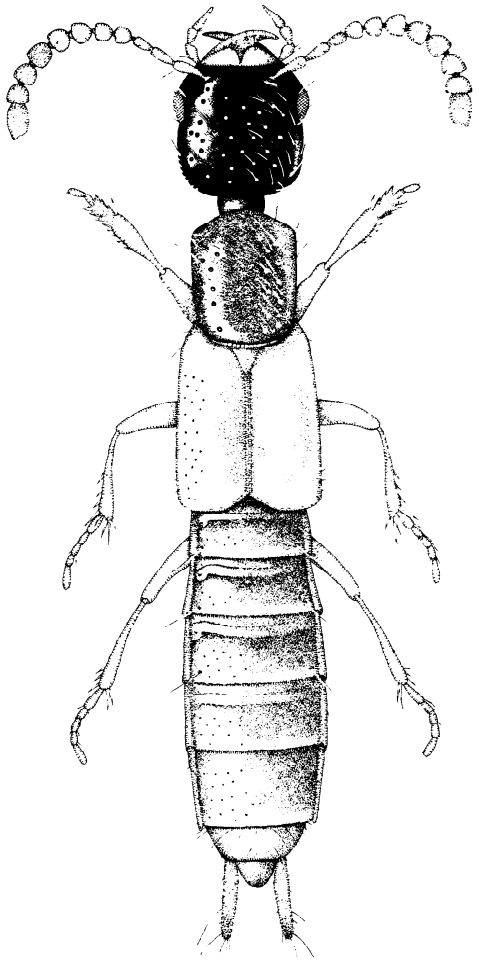
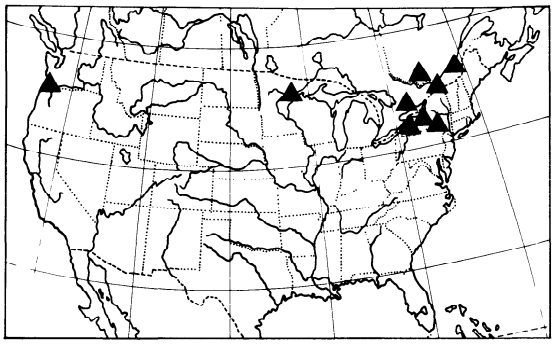


Fig. 4. Habitus of ♂ *N. villosulus* (Stephens). Length 3.7-4.2 mm.

DISTRIBUTION (map 1): Eastern Canada and northern U.S.A., Europe.



Map 1. Distribution of *N. villosulus* in North America

RECORDS: CANADA: Quebec, Montreal, 26-V-1961, E. J. Kiteley (1 y:CNC), 23-IV-1972, E. J. Kiteley (1 ♂:CNC), 19-VI-1973, E. J. Kiteley (1 ♀:CNC), 30-VI-1973, E. J. Kiteley (1 ♂:CNC); Montcalm Co., Mt. Tremblant Park, 27-VI-1961, E. J. Kiteley (1 ♀:CNC); Lotbiniere Co., Ste. Croix, 14-IX-1963, J. C. Aube (1 ♀:CNC); Ontario, York Co., Toronto, R. J. Crew (1 ♂:USNM, 1 ♀:CAS); U.S.A.: New York, Schoharie Co., Schoharie, 10-VI-1918, H. Notman (holotype ♀ of *Actobius fulvicornis*: SIM); Wayne Co., Sodus Point, 10-VI-1919, H. Notman (1 ♀:SIM); Genesee Co., Oakfield, 23-VI-1922, H. Notman (1 ♂:SIM); Minnesota, Crow Wing Co., Brainerd, 24-VII-1961, E. J. Kiteley (1 ♀:CNC); Oregon, Washington Co., Forest Grove, 3-VI-1941 (1 ♂:MCZ).

REMARKS: North American examples appear identical to European examples in USNM. This is the first time that the presence of *villosulus* has been recognized in North America. According to Horion (1965) its distribution in Europe is from Yugoslavia northward to Finland, from the Caucasus westward to England. Its known North American distribution is not restricted to the vicinity of port cities, yet the distribution of other imported species discussed by Lindroth (1957) suggests that *villosulus* also is imported.

2. *Neobisnius lathrobioides* (Baudi)

(fig. 18, map 2)

Philonthus lathrobioides Baudi, 1848:130 (type locality: Italy, Piedmont).

Neobisnius lathrobioides (Baudi); Bordoni, 1975:81.

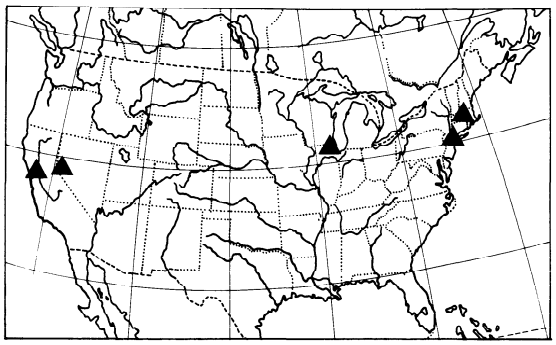
Neobisnius cerrutii Gridelli, 1943:121 (type locality: Italy, Basilicata, Melfi); Last, 1948:148 Fagel, 1954, 36; Smetana 1955:147, 1958:138; Lohse, 1964:172; Horion, 1965:116; Coiffait and Saiz, 1968:361; (synonymy established by Bordoni, 1975:81).

TYPES: Lectotype ♂ of *Philonthus lathrobioides* in Baudi's collection in the Museum of the Istituto di Zoologia Sistematica of the University of Turin, not examined by me; holotype ♂ of *cerrutii* in Gridelli's collection, not examined by me.

DESCRIPTION: Length 3.7-4.2 mm. Head, pronotum, and abdomen piceo-castaneous; elytra rufo-castaneous, without pale apical margin; trophi, legs, and articles I-III of antenna ferruginous; remaining articles of antenna castaneous.

Head slightly elongate, robust, rather cylindrical, not narrowed behind eyes; eye equal to 0.3 of length of side; punctures coarse, not very dense; head of ♂ with shallow, elongate frontal depression (but without fovea); surface with distinct strigulose microsculpture. Pronotum punctate similarly to head with strigulose microsculpture; robust, rather cylindrical; at front angles as broad as hind angles of head. Elytra elongate, parallel-sided, scarcely broader than pronotum; more finely and closely punctate than head and pronotum. Abdomen rather broadened posteriorly to segment VI; punctate similarly to elytra; apical notch of sternum VIII of ♂ small, broader than deep. Articles I, II of antenna distinctly broader than III, articles VIII-X transverse. None of articles of middle or hind tarsus more than twice as long as broad. Aedeagus with parallel-sided, undivided paramere with 4 peg setae (fig. 18).

DISTRIBUTION (map 2): Northeastern and southwestern U.S.A., Europe, northern Africa.



Map 2. Distribution of *N. lathrobioides* in North America

RECORDS: U.S.A.: Massachusetts (1 ♀:MCZ); New York, Kings Co., Brooklyn, 15-V-1941, W. Spector (1 ♀:CAS); Illinois, Cook Co., Chicago (1 ♀:MCZ); Nevada, Lake Tahoe (1 ♀:USNM); California, Marin Co., Mill Valley, 1-IV-1940, R. E. Leech (1 ♂:CAS).

REMARKS: Occurrence of this insect in North America was recognized by Fagel (1954) who examined material from Fauvel's collection originating not only from California and Nevada (U.S.A.) but also from Quebec (Canada). I have not seen this material and have yet seen no examples from Canada. The Old World distribution includes central and southern Europe and northern Africa according to Horion (1965). The New World distribution is not restricted to the vicinity of port cities.

Individuals of this species differ from those of *villosulus* by their more robust and more cylindrical appearance, by the infuscate articles III-XI of the antenna, and by the aedeagus which is not so down-curved nor so pointed at the apex, with a paramere which is longer and expanded towards the apex.

3. *Neobisnius semipunctatus* (Fairmaire and Germain)

(fig. 19, map 3)

Othius semipunctatus Fairmaire and Germain, 1861:434 (type locality: Chile, Santiago).
Philonthus semipunctatus (Fairmaire and Germain); Fauvel, 1866:346.
Erichsonius semipunctatus (Fairmaire and Germain); Fauvel 1874:431; Blackwelder, 1944:132.
Actobius semipunctatus (Fairmaire and Germain); Fauvel 1876:72, 1889:117; Horn, 1884:227.
Neobisnius semipunctatus (Fairmaire and Germain); Ganglbauer, 1895:465; Leng, 1920:106; Scheerpeltz, 1933:1327; Gridelli, 1943:127; Fagel, 1954:35; Coiffait and Saiz, 1968:361.

TYPES: Lectotype ♂ in Fauvel's collection in IRB, not examined by me.

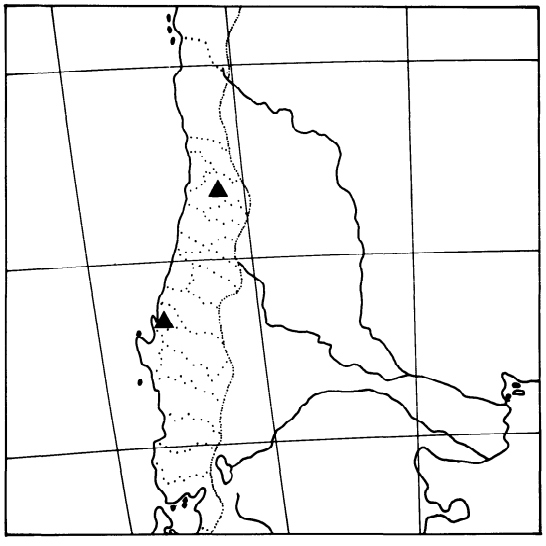
DESCRIPTION: The description following is a translation of descriptions given by Fagel (1954), and Coiffait and Saiz (1968), and its format is not consistent with that of descriptions of other species.

Length 5.0-5.5 mm. Head and pronotum black; elytra dark brown with suture and apical margin reddish brown; abdomen piceous, slightly paler apically; antennae, legs, and trophi pale brown, almost reddish; femora and apices of antennae slightly darker; pubescence yellow.

Head quadrate, broader posteriorly; punctation coarse, fairly dense, with an impunctate median area; integument between punctures with strigulose microsculpture; eye 0.3 length of side of head; neck about 0.3 width of head. Pronotum almost as broad and slightly longer than head; almost parallel-sided, slightly narrowed posteriorly; the posterior border straight with rounded angles; punctate similarly to head with an impunctate median band; with strigulose microsculpture between punctures; large marginal seta at some distance from lateral margin. Elytra broader and much longer than pronotum, longer than jointly broad; finely and rather densely punctate; the punctures separated by twice their diameter. Scutellum punctate similarly to elytra and with strigulose microsculpture. Abdomen anteriorly more finely and closely punctate than elytra, this becoming sparser posteriorly; with strigulose microsculpture.

Antenna with penultimate article slightly transverse. Last article of maxillary palpus as broad at base and slightly longer than penultimate, very pointed apically. Last article of labial palpus as broad as penultimate. Gular sutures united from about middle. Anterior tarsi of ♂ dilated. Aedeagus small, with median lobe gradually narrowed to a point, paramere entire with parallel sides; very pointed at apex, with 2 pairs of peg setae at base of apical part, and with 4 short lateral setae proximal to the peg setae (fig. 19).

DISTRIBUTION (map 3): Central Chile.



Map 3. Distribution of *N. semipunctatus* in central Chile

RECORDS: The only records known to me are those given by Coiffait and Saiz (1968), plotted on map 2.

REMARKS: Records of the occurrence of this species in North America (Horn, 1884; Fauvel, 1889; Leng, 1920) are erroneous. Fairmaire and Germain (1861) gave the adult length as 4.0 mm, but Coiffait and Saiz (1968) gave it as 5.0-5.5 mm. If the latter authors made no error in measurement, and if they measured from the same points of reference as I have used (unstated in their publication), then individuals are the largest known representatives of the species group.

N. nothocreatus group

DIAGNOSIS: Head of ♂ without frontal fovea; paramere of aedeagus bifurcate symmetrically (fig. 20), with peg setae not restricted to apices of furcae; strigulose microsculpture of head and pronotum evident; anterior transverse depressions of terga III-VI with tuberculate punctures, but these not very pronounced.

4. *Neobisnius nothocreatus* Frank, NEW SPECIES

(fig. 5, 20, map 4)

TYPES: Holotype ♂ in CAS with labels: MOKEL. HILL. CAL./F. E. Blaisdell Collector/Blaisdell Collection/*Neobisnius nothocreatus* Frank, J. H. Frank holotype/. All the examples listed among records are designated and labelled as paratypes.

DESCRIPTION: Length 4.0-4.5 mm. Color range broad; head dark castaneous to piceous; pronotum pale ferruginous to castaneous; elytra castaneous to dark castaneous, with apical margin very narrowly and indefinitely paler; abdomen with segments II-VI ferruginous, VII-VIII dark castaneous or entirely castaneous; legs with tarsi fulvous to ferruginous, other articles infuscate; trophi and articles I-II of antenna fulvous to ferruginous, remaining articles darkly infuscate.

Head quadrate; eye equal to 0.35 length of side; slightly narrowed behind eyes (more so than either *villosulus* or *lathrobioides*); rather coarsely, sparsely punctate with distinct strigulose microsculpture between punctures. Pronotum anteriorly as broad as head at hind angles; narrowed posteriorly; longer than broad; slightly sinuate laterally; punctate more densely than head; microsculpture similar to that of head. Elytra very distinctly longer than broad; finely punctate; microsculpture indistinct. Abdomen parallel-sided; finely punctate, about as densely so as elytra; microsculpture evident between punctures; terga III-VI with basal transverse depression, but without pronounced tuberculate punctures. Apical notch of sternum VIII of ♂ shallow. Tarsal articles rather short; articles VIII-X of antenna slightly transverse.

Aedeagus (fig. 20) unusual, median edges of both furcae of paramere lined with peg setae.

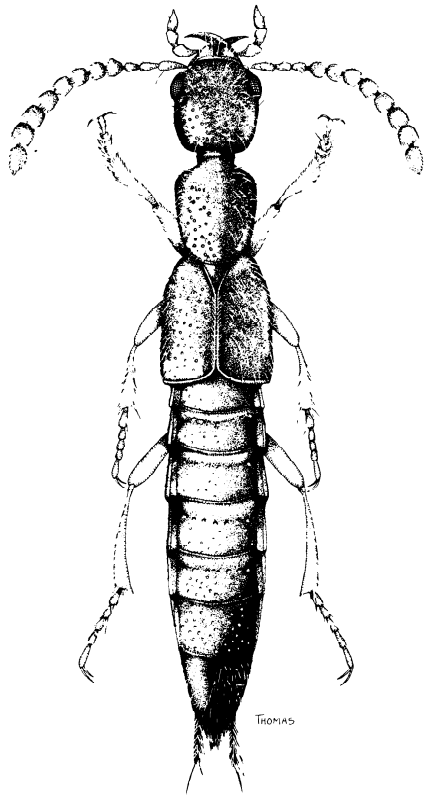
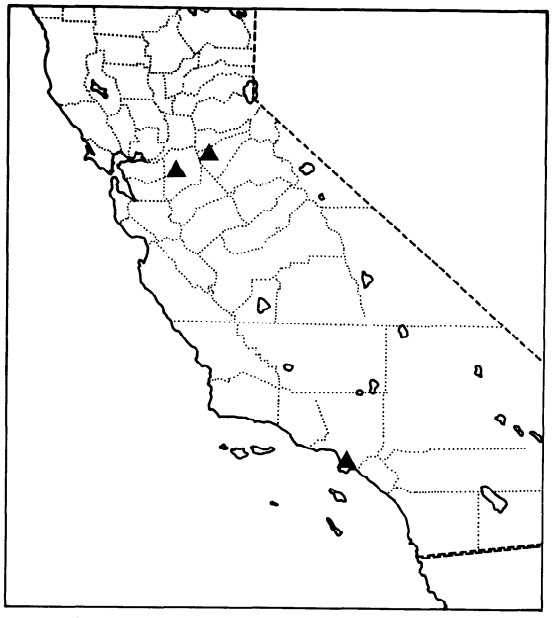


Fig. 5. Habitus of ♂ *N. nothocreatus* Frank. Length 4.0-4.5 mm.

DISTRIBUTION (map 4): Central and southern California (U.S.A.)



Map 4. Distribution of *N. nothocreatus* in southern California (U.S.A.)

RECORDS: U.S.A.: California, Calaveras Co., Mokelumne Hill, F. E. Blaisdell (holotype ♂:CAS), 18-VII-1910, F. E. Blaisdell (paratype ♂:CAS); Hubbard and Schwarz (paratype ♂:USNM), F. C. Bowditch (paratype ♂:MCZ); Los Angeles Co., Redondo, IV (paratype ♂:INHS); San Joaquin Co., 31-V-1917, W. M. Gifford (paratype ♂:CNC).

REMARKS: Males are distinguished readily from those of the 3 species of the *villosulus* group by the characters of the aedeagus. The head is more narrowed behind the eyes than in either *villosulus* or *lathrobioides*. The paratype from Redondo is larger than the other examples (4.5 mm cf. about 4.0 mm) and is "particolored", with the pale ferruginous, almost flavo-rufous pronotum and basal articles of abdomen contrasting distinctly with the much darker head and elytra; while in the holotype and other paratypes the head, pronotum, elytra, and abdomen are almost unicolorous castaneous. However, apart from its size and coloration, I cannot distinguish this paratype from the holotype and remaining paratypes. It is curious that another Californian species, *infimus*, also appears to have a dark and a pale colored form. It is surprising that all of the 6 known examples of the species are ♂. The distinct microsculpture distinguishes *nothocreatus* from the sympatric species *sobrinus* and *infimus*, with which there is otherwise some risk of confusion if comparison is made only of external characters. The name is derived from *notho* (false) and *ocreatus*, because 1 of the specimens bore a label "*Actobius ocreatus* Horn" (see *Neobisnius sobrinus*).

N. terminalis group

DIAGNOSIS: Head of ♂ without frontal fovea; aedeagus kite-shaped (fig. 21, 22), its paramere symmetrically bifurcate, the furcae long, slender, widely divergent; microsculpture of head and pronotum indistinct to absent; form elongate, slender; anterior transverse depressions of terga III-VI with coarse tuberculate punctures.

5. *Neobisnius parcepunctatus* Bernhauer

(fig. 21, map 5)

Neobisnius parcepunctatus Bernhauer, 1912:176 (type locality: Argentina, "Chaunar Region", probably La Rioja, Chañar Region); Bernhauer and Schubert, 1914:323.

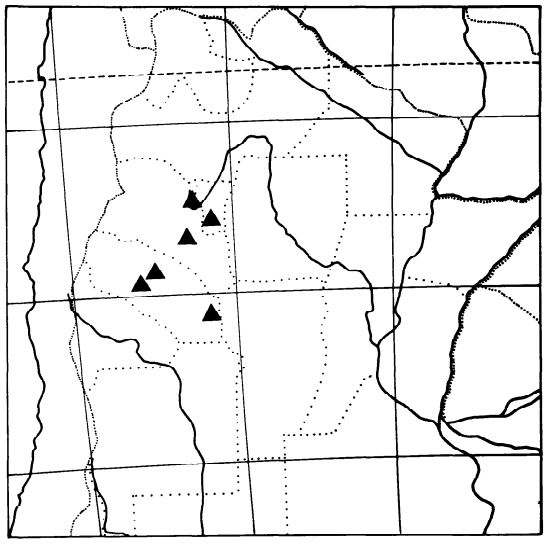
Erichsonius parcepunctatus (Bernhauer); Blackwelder, 1944:132.

TYPES: Holotype ♀ in Bernhauer's collection in FMNH with the following labels: Chaunar Reg. Argent. Jensen/*parcepunctatus* Brh. Typus [yellow paper]/ Chicago NHMus. M. Bernhauer collection/. Four paratypes with similar labels but each as "Cotypus" in FMNH, 1 in BMNH.

DESCRIPTION: Length 4.5 mm. Head flavo-rufous with vertex of many examples infuscate, leaving base of head and frons paler; pronotum flavo-rufous; elytra colored as head but more darkly infuscate, with pale apical border of variable width, some examples paler along suture; abdominal segment II-VI pale castaneous with flavescent apical margin, VII-VIII piceo-castaneous with flavescent apical margin; legs and trophi pale rufous, antenna with articles I-II rufous, remaining articles picescent.

Head quadrate to slightly elongate, but slightly broader behind eyes and with hind angles very broadly rounded; eyes occupying about 0.3 of length of side; sparsely, shallowly punctate with indistinct strigulose microsculpture between punctures. Pronotum longer than broad; sparsely punctate, leaving irregular series of punctures bordering broad, impunctate median line; distinctly narrower than head. Elytra markedly broader than pronotum; longer than jointly broad; broader posteriorly; more finely and rather more close punctate than pronotum; shining between punctures. Abdomen narrower than elytra; broadened to segment VI; apical notch of sternum VIII of male deep. Article II of antenna scarcely broader than article III; penultimate article quadrate, not transverse. Aedeagus (fig. 21) very similar to that of *terminalis* (fig. 22).

DISTRIBUTION (map 5): Western Argentina.



Map 5. Distribution of *N. paracepunctatus* in western Argentina

RECORDS: ARGENTINA: La Rioja, Chañar region, Jensen (holotype and 4 paratypes:FMNH: 1 paratype ♀:BMNH), S.E. of Villa Unión at 525 km marker, 2-XII-1971, 1,600 m, L. H. Herman (2:AMNH), 5 km E. of Chilecito, 30-XI-1971, 1,500 m, L. H. Herman (6:AMNH); Tucuman, Montéros Segunda Dep., Simoca, VII-1933, F. Schade (2:FMNH; 4:AMNH); Catamarca, Santa María Dep., Fuerte Quemado, Walters (1:FMNH), Concepción, 5-XII-1971, L. H. Herman (3:AMNH).

REMARKS: Examples of this species are distinguished easily from those of other described South American

species by their slender form with broad elytra, and pale head with infuscate mark.

The type locality was published by Bernhauer (1912) as "Chaunar Reg.", and this name occurs on the labels of the holotype and paratypes. I am not aware of any Chaunar region in Argentina and I believe that the name came about through a misinterpretation of the Spanish tilde accent, which view is also shared by Dr. Pedro Wygodzinsky (AMNH) who has lived in Argentina (pers. comm.). However, Chañar is in the province of La Rioja, in western Argentina from which have originated all the other examples I have seen of the species. Dr. Wygodzinsky has informed me there is an arid region to the S.E. of Buenos Aires called the Chañar, but this seems a less likely venue.

6. *Neobisnius terminalis* (LeConte)

(fig. 6, 22, map 6)

Philonthus terminalis LeConte, 1863:38 (type locality: U.S.A., Maryland).
Erichsonius terminalis (LeConte); Fauvel, 1874:427.
Neobisnius terminalis (LeConte); Bernhauer and Schubert, 1914:324; Leng, 1920:106; Bierig, 1933:56; Smetana, 1965:11.
Actobius elegantulus Horn, 1884:232 (type locality: U.S.A., Arizona).
Neobisnius elegantulus (Horn); Bernhauer and Schubert, 1914:322; Leng, 1920:106.
Erichsonius elegantulus (Horn); Blackwelder, 1944:131. SUBSPECIES, NEW STATUS.
Actobius delicatulus Sharp, 1885:461 (type locality: Guatemala, Escuintla, Pantaleon).
Neobisnius delicatulus (Sharp); Bernhauer and Schubert, 1914:322; Bernhauer, 1921:105.
Erichsonius delicatulus (Sharp); Blackwelder, 1944:131. NEW SYNONYMY.
Actobius adustus Sharp, 1887:790 (type locality: Mexico, Oaxaca).
Neobisnius adustus (Sharp); Bernhauer and Schubert, 1914:322; Bierig, 1933:48.
Erichsonius adustus (Sharp); Blackwelder, 1944:131. NEW SYNONYMY.

Two subspecies are recognized: *t. terminalis* (LeConte) and *t. elegantulus* (Horn).

TYPES: Lectotype ♂ of *Philonthus terminalis* in LeConte's collection in MCZ with labels: [pink disc]/♂/ terminalis no. 6285/; designated here. Lectotype ♂ of *Actobius elegantulus* in Horn's collection in MCZ with labels: Ari./♂/Lectotype 3115 [red paper]/*A. elegantulus* Horn/; designated here. Holotype ♂ of *Actobius delicatulus* in Sharp's collection in BMNH labelled: *Actobius delicatulus* Type D. S. Pantaleón Guatem. 1700 ft. Champion [written on specimen card]/Type [in red circle on disc]/Pantaleón, 1700 ft. Champion/B.C.A. Col. 1, 2. *Actobius delicatulus*, Sharp/Sharp Coll. 1905-313/. Holotype ♀ of *Actobius adustus* in Sharp's collection in BMNH labelled: *Actobius adustus* Type D. S. Tehuantepec [written on specimen card]/Type[in red circle on disc]/Tehuantepec, Oaxaca. Höge/Sharp Coll. 1905-313/B.C.A. Col. 1, 2. *Actobius adustus*, Sharp/.

The lectotype of *Philonthus terminalis* is 1 of the 2 syntypes (I have not seen the other) in LeConte's collection in MCZ; I have remounted it on a 3 × 10 mm specimen card.

DESCRIPTION: Length 4.5-5.0 mm. Head piceous, pronotum flavo-rufous, elytra piceous with apical 0.4 flavo-rufous, scutellum flavo-rufous to somewhat infuscate; terga II-VI flavo-rufous, VII piceous but both basally and apically flavo-rufous, VIII flavo-rufous but with broad infuscate band; legs and trophi flavo-rufous; antenna flavo-rufous but with articles IV-XI infuscate. The above description is of the typical subspecies, *terminalis terminalis*, whose range extends from Canada (Nova Scotia) to the U.S.A.-Mexican border (Texas, New Mexico). *N. terminalis elegantulus* is confined to the southwestern United States (Arizona, southern California) and extreme northwestern Mexico (Baja California, Baja California del Sur) and differs in that the color is flavous rather than flavo-rufous, and the dark markings of the elytra are reduced to an infuscate lateral spot midway along the length of each elytron. Elsewhere in the range of the species (northern California, northeastern and southern Mexico, and Guatemala) the color pattern is intermediate between the 2 patterns described above, with the dark color of the elytra variously reduced and the basic color of the pronotum and abdomen between flavous and flavo-rufous. Six specimens from Costa Rica were the darkest seen, with abdomen, pronotum, antenna from article III, and last article of maxillary palpus infuscate.

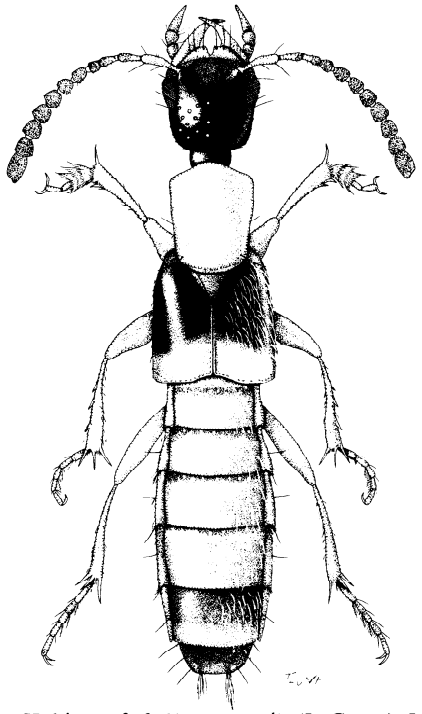
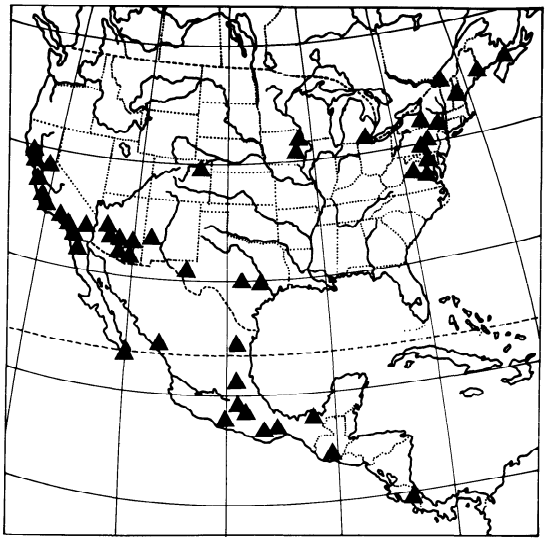


Fig. 6. Habitus of ♂ *N. terminalis* (LeConte). Length 4.5-5.0 mm.

Head rather elongate, scarcely narrowed behind eyes with hind angles broadly rounded; eyes occupying 0.4 of length of the side; punctures coarse but sparse, shining between without microsculpture. Pronotum narrower than head, elongate; distinctly sinuate laterally; sparsely punctate and without microsculpture. Elytra distinctly broader than pronotum; longer than jointly broad; finely, sparsely punctate; somewhat broader posteriorly. Abdomen distinctly narrower than elytra; slightly broader to segment VI; finely, rather sparsely punctate; apical notch of sternum VIII of ♂ shallow. Article II of antenna scarcely broader than III; penultimate article quadrate to slightly elongate. Aedeagus illustrated by fig. 22.

DISTRIBUTION (map 6): Eastern Canada southwards to Costa Rica.



Map 6. Distribution of *N. terminalis* in North and Central America

RECORDS: CANADA: Nova Scotia, Colchester Co., Portapique, 27-VIII-1929, C. A. Frost (1:MCZ); Quebec, Nicolet Co., Becancour, 2-X-1960, J.-C. Aubé (1:CNC); U.S.A.: Maine, Washington Co., Machias River, 10-VIII-1966, A. E. Brower, (1:CNC); New Hampshire, Grafton Co., Plymouth, 31-VIII-1924, P. J. Darlington (1:MCZ); New York, Schuyler Co., Watkins Glen, A. T. Slosson (1:AMNH); Greene Co., Ashland, 1-4-VIII-1924, C. A. Frost (1:MCZ); Pennsylvania, Monroe Co., Water Gap 5-XI, A. T. Slosson (1:AMNH); Lancaster Co., Lime Rock (2:MCZ); Michigan, Monroe Co., Monroe, Hubbard and Schwarz (9:USNM); Iowa, Buchanan Co., Independence, H. F. Wickham (1 ♂:USNM); Johnson Co., Iowa City, H. F. Wickham (1 ♂:USNM); Colorado, Yuma Co., 32 mi. S. of Wray, S. fork of Republican River, 8-IX-1970, L. H. Herman (1 ♂:AMNH); Maryland, (lectotype ♂ and paralectotype of *Philonthus terminalis*:MCZ); Virginia, Stafford Co., Potomac Creek, 21-V-1896 (3:MCZ); Rockingham Co., ca. 10 mi. S. of Elkton, Big Run at hwy. 340, 29-V-1979, in river drift, J. H. Frank (1♂:JHFC); Texas, Colorado Co., Columbus, 30-VIII, H. G. Hubbard and E. A. Schwarz (1:USNM); Jefferson Davis Co., Davis Mountains, 10 mi. S. of Fort Davis, 24-V-1968, L. H. Herman (7: AMNH); Gillespie Co., Lange's Mill, 3-VI-1968, Board and Hafernik (1♂:TAMU); New Mexico, Catron Co., 4 mi. E. of Glenwood, Whitewater Canyon, 20-VIII-1952, H. B. Leech (1:CAS); Arizona, (lectotype ♂ of *Actobius elegantulus*:MCZ); Graham Co., San Carlos Lake, 15-III-1931, Duncan (1:AMNH); Maricopa Co., Cave Creek, 1-VI-1940, G. P. MacKenzie (1:IM), Verde River (5:MCZ); Pima Co., Arivaca Creek at Arivaca, 31-VII-1952, H. B. Leech (1:CNC), Baboquivari Canyon, W. side of Baboquivari Mountains, 25-27-VII-1952, H. B. Leech (1:CNC), Santa Catalina Mountains, 8-V-1933, Bryant (3:CAS), 14-V-1933, Bryant (7:CAS), 25-V-1936, Bryant (3:MCZ), Tucson, 5-IV-1897 (1:CAS), 10-IV-1935, Bryant (1:CNC), 12-III-1946, J. W. Green (3:CAS), 14-III-1946, J. W. Green (3:CAS), 16-III-1946, J. W. Green (1:CAS), 18-III-1946, J. W. Green (10:CAS), Tucson, Bear Canyon, 10-III-1946, J. W. Green (3:MCZ), Santa Rita Mountains, 15-X-1939, Bryant (1:CNC); Pinal Co., Oracle, 27-VII-1924, J. O. Martin (3:CAS; 2:CNC); Santa Cruz Co., Madera Canyon, 25-VII-1972, at light, R. H. Crandall (1:IM), Patagonia, 6-VIII-1973, J. Pinto (1:IM), Tumacacori Mountains, Sycamore Canyon, Yanks' Spring, 3-VIII-1952, H. B. Leech (1:CAS; 1:CNC); Yavapai Co., Bumble Bee, 30-V-1919, E. Schiffel (1:CAS); California, Calaveras Co., Mokelumne Hill, 18-VII-1910, F. E. Blaisdell (1:CNC), VII, F. E. Blaisdell (1:CAS); Lake Co., Lucerne, 24-VII-1955, H. B. Leech (1:CNC), 29-VII-1955, H. B. Leech (1:CAS); Los Angeles Co., Azusa, V, (3:CAS), Newhall (1:USNM), Palmdale, 9-VI-1918 (10:CAS; 5:CNC), Pasadena, VI-1897 (1:CAS), 10-X-1897 (1:MCZ), 7-IX-1917 (2:CAS), Pomona (3:MCZ), Pomona Mountains (4:USNM); [? Orange Co.], Santa Ana Canyon, H. F. Wickham (1:SMKU); Riverside Co., Bautista Canyon, 23-IV-1972, K. W. Cooper (1:IM), 5 mi. up Bautista Canyon, 29-IV-1972 (1:IM), Elsinore, 1-IX-1917 (8:CAS), San Mateo Canyon, Tinaja St., 28-VIII-1968, K. W. Cooper (1:IM), Palm Springs, 11-VII-1897, A. P. Morse (2:MCZ), IV (2:CAS), 16-III-1955, W. R. Mason (1:CNC); San Bernardino Co., Hesperia, 30-VI-1918 (2:CAS), Lake Arrowhead, 27-VII-1944, G. P. MacKenzie (2:IM), Waterman Canyon, 27-V-1916 (2:CAS); San Diego Co., Boulder Oakes, 9-V-1954, I Moore (1:CNC), Campo, 14-IV-1951, I. Moore (1:CNC), Dulzura, 7-XI-1950, I. Moore (1:CNC), El Monte Oaks, 23-III-1955, I Moore (4:CNC), 16-IV-1955, I. Moore (4:CNC), 12-VI-1958, I. Moore (2:CNC), Mission Dam, 30-IX-1954, I. Moore (2:CNC), Poway, F. E. Blaisdell (4:CAS), San Diego, F. E. Blaisdell (1:CAS); Santa Barbara Co., Ynez River, Victoria Station, 13-VII-1971, u.v. light , 335 m. S. Frommer (1:IM); Santa Clara Co., Los Gatos, 10-VI-1904 (2:CAS); San Luis Obispo Co., Atascadero, 15-VIII-1956, I. Moore (2:CNC), 23-IX-1950, I. Moore (1:CNC); Sonoma Co., Duncan Mills, 17-VII-1908, F. E. Blaisdell (1:CAS), mouth of Russian River, I-1970, sandpit, under damp driftwood, D. Giuliani (1:IM); Stanislaus Co., La Grange, 9-IX-1970, at light (3:IM); MEXICO: Baja, California, Tecate, 11-VI-1950, I. Moore (1:CNC); Baja, California del Sur, San José del Cabo (1:USNM), Cape San Lucas (1:AMNH); Hidalgo, route 85, Rio Tula near Tasquillo, 13-XI-1965, 1,615 m, D. R. Whitehead (6:JHFC); Tamaulipas, Hidalgo, 11-X-1938, L. J. Lipovsky (1 ♂:SMKU); Guerrero, 30.8 mi. N. of

Zumpango del Río, route 95, 20-XI-1965, 580 m, G. E. Ball and D. R. Whitehead (3:JHFC); Sinaloa, Aruya, 4-XI-1958, I. Moore (1:CNC), 5-XI-1958, I. Moore (3:CNC), 12-XI-1958, I. Moore (11:CNC); Puebla, gravel stream near Petlalcingo, route 190, 25-III-1966, 1,310 m, G. E. Ball and D. R. Whitehead (3:JHFC), 9 mi. S. of Matamóros, 8-VI-1971, D. E. Bright (2:CNC); Oaxaca, Río El Chile, Marilú, 21-VIII-1970, Cheary and Hardy (2:IM), Tehuantepec, Höge (holotype ♂, 2 paratype ♂♂ and 2 paratype ♀♀ of *Actobius adustus*:BMNH); Tabasco, Tcapa, Höge (1 ♂:BMNH); GUATEMALA: Escuintla, Pantaleon, 520 m, H. G. Champion (holotype ♀ and paratype ♀ of *Actobius delicatulus*:BMNH); COSTA RICA: Limón, Río Pacuarito at hwy. 32, 31-VII-1979, under stones by river, J. H. Frank (6:JHFC).

REMARKS: I am unable to distinguish the lectotype of *Philonthus terminalis* from the lectotype of *Actobius elegantulus* except by the clearly different color pattern. The types of *Actobius adustus* and *Actobius delicatulus* belong to this same species and are intermediate in color, though the former has a more infuscate abdomen. I believe that all are conspecific. It is unfortunate that the rule of priority demands that the species be referred to as *Neobisnius terminalis* with the result that the typical form must be considered the dark form, distributed from Nova Scotia in the northeast to about the U.S.A.—Mexican border. The subspecies *t. elegantulus* is then distinguished clearly from the typical subspecies by adult color pattern, but forms occurring in northern California, in eastern and southern Mexico, and in Guatemala are difficult to attribute to either of the 2 subspecies because of their intermediate color pattern. From a biological rather than nomenclatural viewpoint, I believe that the forms from southern Mexico and Guatemala are more typical of the species.

The species was recorded by Bierig (1933), under the name *Neobisnius adustus* (Sharp), from Panama, but I have not seen the specimens on which the identifications were based. I have no reason to doubt that Bierig's identification was correct.

N. gratus group

DIAGNOSIS: Head of ♂ without frontal fovea; paramere of aedeagus bifurcate symmetrically, furcae short, slender and divergent, without peg setae (fig. 23-25); anterior transverse depressions of terga III-VI with tuberculate punctures, but these not coarse nor very evident; microsculpture of head not very evident, but strigulose.

7. *Neobisnius flavomaculatus* Bernhauer

(fig. 23, map 7)

Neobisnius flavomaculatus Bernhauer, 1908:336 (type locality: Brazil, Santa Catarina); Bernhauer and Schubert, 1914:323.

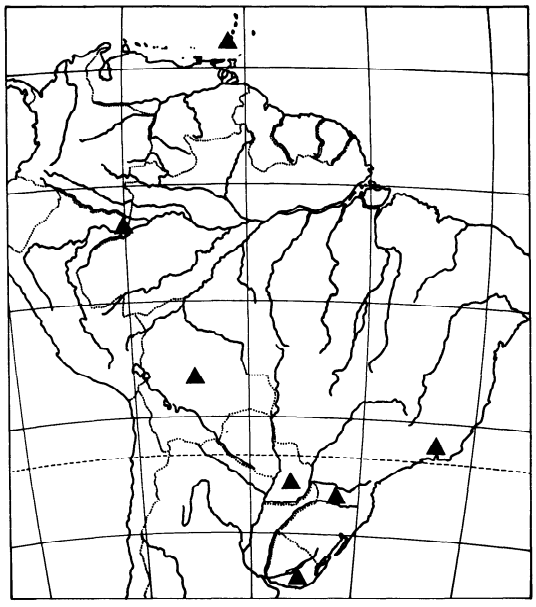
Erichsonius flavomaculatus (Bernhauer); Blackwelder, 1944:131.

TYPES: Holotype ♀ in Bernhauer's collection in FMNH with labels: S. Catarina Lüderwaldt [green paper]/ 265/ *Neobisnius flavomaculatus* Bernh. Typus [yellow]/ Chicago NHMus. M. Bernhauer Collection. Paratype ♂ in same collection with labels: S. Catarina Lüderwaldt [green paper]/ 139/*flavomaculatus* Brh. Cotypus [yellow]/ Chicago NHMus. M. Bernhauer Collection/.

DESCRIPTION: Length 4.0-4.2 mm. Head and pronotum rufo-castaneous; elytra basally rufous with apical 0.6 picescent except apical margin flavescent and suture rufous; abdominal segments piceous with apical margins rufous; legs and trophi rufous; antenna rufous with articles III-VIII darkly infuscate and IX-XI progressively less infuscate and more rufous.

Head quadrate, not much narrowed behind eyes; eye occupying 0.4 of length of side of head; rather sparsely punctate; shining between punctures and with fairly distinct strigulose microsculpture. Pronotum as broad anteriorly as head; scarcely longer than broad; narrowed posteriorly, punctate and microsculptate much as head. Elytra not much broader than pronotum, more densely and finely punctate. Abdomen almost linear; finely punctate; apical notch of sternum VIII of ♂ rather deep. Articles VIII-X of antenna slightly transverse. Aedeagus illustrated by fig. 23.
illustrated by fig. 23.

DISTRIBUTION (map 7): Uruguay northwards to southern Lesser Antilles.



Map 7. Distribution of *N. flavomaculatus* in South America and the Lesser Antilles

RECORDS: URUGUAY: Montevideo, Pte. Silva, 3-X-1933 (8:FMNH), Prada, 2-II-1934 (2:FMNH); PARAGUAY: Caazapá, Pastoreo, 1-3-I-1972, L. Peña (1:CNC); BRAZIL: (1 ♂:BMNH); Rio de Janeiro (1:FMNH), Squires (1 ♂:BMNH); Sta. Catarina, Lüderwaldt (holotype ♀ and paratype ♂:FMNH), Nova Teutonia 3-

XI-1938, under stones, F. Plaumann (1:FMNH), I-1971, 300-500 m, F. Plaumann (1:CNC), III-1972, light trap, F. Plaumann (3:1M), I-1973, F. Plaumann (5:1M); BOLIVIA: Sta. Cruz, Saavedra Research Station, 10-IV-1978, u.v. light trap, H. Serrate (6:JHFC); COLOMBIA: Amazonas, Leticia, 19-25-II-1972, 215 m, R. H. Parry (1:CNC); GRENADA: St. Andrew, Balthazar, H. H. Smith (1 ♂:FMNH).

REMARKS: Adults of this species are strikingly distinctive among South American species as the only known representatives there of the species group. The ♂ example from Grenada was mentioned by Bernhauer (1908) in the original description of the species, but the record was not cited by Bernhauer and Schubert (1914), nor by Blackwelder (1944); however, I am convinced that it does belong to *flavomaculatus*.

8. *Neobisnius gratus* (LeConte)

(fig. 7, 24, map 8)

Philonthus gratus LeConte, 1863:38 (type locality: U.S.A., California, Colorado River near Fort Yuma).
Actobius gratus (LeConte); Fauvel, 1874:427; Horn, 1884:231.
Neobisnius gratus (LeConte); Bernhauer, 1912:176; Bernhauer and Schubert 1914:323; Leng, 1920:106; Bierig, 1933:56; Scheerpeltz, 1933:1327.
Erichsonius gratus (LeConte); Blackwelder, 1944:131.

TYPES: Lectotype ♂ in LeConte's Collection in MCZ with labels: [gold disc]/♂ *gratus* no. 6283/. This is 1 of 5 syntypes, the only 1 I have examined, and I designate it lectotype. I have removed it from the original card point and remounted it on a 3 × 10 mm card.

DESCRIPTION: Length 5.0 mm. Head and pronotum entirely flavo-rufous to rufous; elytra and scutellum flavo-rufous to rufous but with outer apical 0.3 to 0.6 darkly infuscate, apical margin and suture flavo-rufous; terga II-VI flavo-rufous to rufous, VII-VIII picescent, but with basal margin of VII rufous; legs, trophi, labrum and antenna flavo-rufous but with articles IV-XI of antenna infuscate.

Head quadrate, parallel-sided; eye occupying 0.45 of length of side; rather coarsely but not densely punctate, with indistinct strigulose microsculpture between punctures. Pronotum slightly elongate, as broad as head; punctate similarly to head; scarcely sinuate laterally; slightly narrowed behind. Elytra slightly broader jointly than pronotum; more closely and finely punctate than pronotum; longer than jointly borad. Abdomen not much narrower than elytra; more closely and finely punctate than elytra; anterior transverse depressions of terga III-VI with scarcely a trace of tuberculate puctures; apical notch of sternum VIII of ♂ deep. Article II of antenna scarcely broader than III; articles VIII-X quadrate to slightly transverse. Aedeagus illustrated by fig. 15.

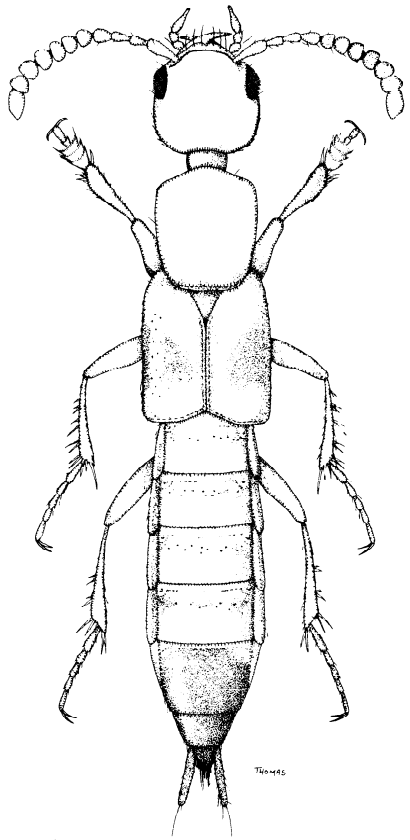
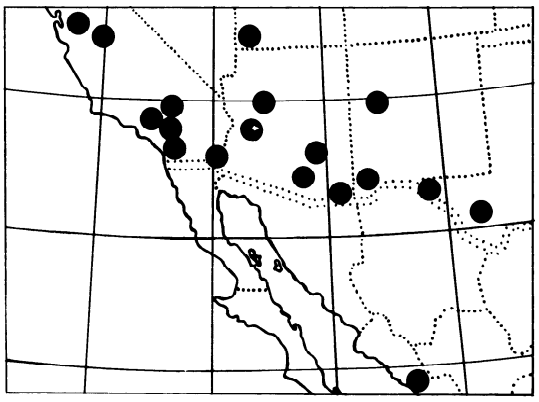


Fig. 7. Habitus of ♂ *N. gratus* (LeConte). Length 5.0 mm.

DISTRIBUTION (map 8): Southwestern U.S.A. and northern Mexico.



Map 8. Distribution of *N. gratus* in southwestern North America

RECORDS: U.S.A.: Utah, Washington Co., St. George (1 ♀:AMNH); Texas, El Paso Co., El Paso (1 ♀:AMNH; 1 ♀:USNM; 2 ♂:MCZ); Jefferson Davis Co., Davis Mountains, 10 mi N. of Ft. Davis, 24-V-1968, along shore of stream, L. H. Herman (1 ♀:AMNH); New Mexico, Hidalgo Co., Lake Cienega, 26-VII-1965, L. H. Herman (1 ♂:AMNH); Bernalillo Co., Albuquerque, H. F.

Wickham (1:USNM; 1:SMKU); Arizona, Graham Co., San Carlos Lake, 15-III-1931, Duncan (1:CAS), Geronimo, 28-IV-1924, J. O. Martin (3:CAS); Pima Co., Tucson, 1-V-1933, Bryant (1:CAS), Sabino Canyon, 28-IV-1948, L. D. Beamer (1:SMKU); Cochise Co., Douglas, VIII, F. H. Snow (1:SMKU); Coconino Co., Bill Williams Fork, VIII, F. H. Snow (1:SMKU); Maricopa Co., Wickenburg, 26-IX-1946, G. P. MacKenzie (1:IM), Salt River (10:MCZ); California, Imperial Co., Colorado River near Fort Yuma (lectotype ♂:MCZ), Yuma (3:USNM), 5-7-VIII (2:CAS; 2:USNM; 4:MCZ), 22-IV-1904 (2:CAS), 23-IV-1904 (3:CAS); Riverside Co., Riverside (1:CAS), Prado Park, 13-VI-1970, sandy edge of stream, I. Moore (1:IM), Temecula Canyon, Santa Margarita River, 18-V-1969, u.v. light trap, E. I. Schlinger (1:IM); Los Angeles Co., (1:CAS), Pasadena, II (2:CAS), Rivera, 14-IV-1918 (1:CAS); San Diego Co., Poway, F. E. Blaisdell (1:CAS), Mission Dam, 30-IX-1954, I. Moore (1:CNC), Lake Wohlford, 5-II-1954, I. Moore (1:CNC); Contra Costa Co., Antioch, VIII-1936 (1:CAS), Brentwood, 28-VII-1936 (1:CAS); San Bernardino Co., Victorville (1:CAS); Stanislaus Co., La Grange, 9-IX-1970, at light (2:IM), 12-IX-1970, at light (1:IM), 3-X-1970, at light (1:IM); MEXICO: Sinaloa, 54 mi. S. of Culiacan, 23-IV-1969, u.v. light, dry wash, M. E. Irwin (2:IM).

REMARKS: Adults are distinguished from those of all other North American species by the flavo-rufous head and pronotum. The species apparently is restricted to the southwestern United States and neighboring Mexico, though its distribution in Mexico needs further investigation. Use of the name *Philonthus gratus* by LeConte (1850:220) for a species from the region of Lake Superior without further description, makes this (first) name a nomen nudum, and so the name was available in 1863.

9. *Neobisnius paederoides* (LeConte)

(fig. 25, map 9)

Philonthus paederoides LeConte, 1863:38 (type locality: U.S.A., "Central Valley, Illinois, Missouri, etc."); Hubbard and Schwarz, 1878:631.

Erichsonius paederoides (LeConte); Fauvel, 1874:427, Blackwelder, 1944:131.

Actobius paederoides (LeConte); Horn, 1884:231.

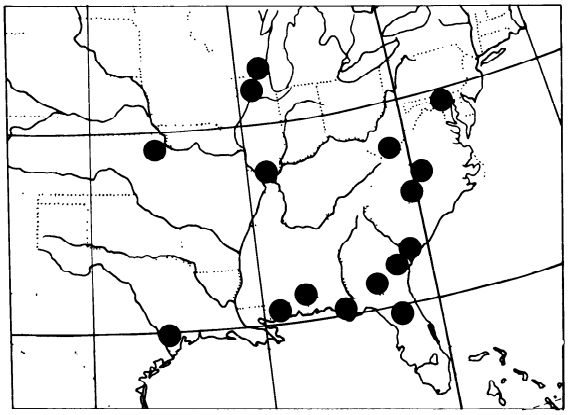
Neobisnius paederoides (LeConte); Bernhauer and Schubert, 1914:323; Leng, 1920:106; Bierig, 1933:56; Hatch, 1957:175.

TYPES: Lectotype ♂ in Le Conte's collection in MCZ with labels: [yellow disc]/♂*paederoides* no. 6284/. This is 1 of 5 syntypes, the only 1 I have examined, and I designate it lectotype. I have removed it from the original card point and remounted it on a 3 × 10 mm card.

DESCRIPTION: Length 4.5-5.0 mm. Head piceous; pronotum flavo-rufous; elytra piceous with apical margin (about 0.14 of length of elytra) flavo-rufous; scutellum flavo-rufous; terga II-VI flavo-rufous, and VII-VIII piceous, but VII with base narrowly flavo-rufous; legs flavous to flavo-rufous; trophi and articles I-III of antenna colored as legs, remaining articles of antenna darkly infuscate; "parti-colored".

Head quadrate to slightly transverse; eye occupying 0.4 of length of side, prominent; punctures large, shining between and with indistinct strigulose microsculpture. Pronotum slightly elongate; anteriorly as broad as head behind eyes; only slightly sinuate laterally, slightly narrowed posteriorly; punctures much as those of head but not so obvious because of paler color; microsculpture scarcely evident. Elytra scarcely broader than pronotum; longer than jointly broad; broader posteriorly; rather finely punctate. Abdomen scarcely narrower than elytra; almost linear; anterior transverse depressions of terga III-VI without obvious tuberculate punctures; finely punctate; apical notch of sternum VIII of ♂ broad but not deep. Article II of antenna scarcely broader than article III; articles VIII-X quadrate. Aedeagus illustrated by fig. 25.

DISTRIBUTION (map 9): Eastern and southern U.S.A.



Map 9. Distribution of *N. paederoides* in eastern North America

RECORDS: U.S.A.: New York, (1 ♂:USNM); Maryland, Montgomery Co., 29-V-1904, E. Shoemaker (1:USNM), 30-V-1904, E. Shoemaker (2♂♂:USNM), 7-IX-1904, E. Shoemaker (2:USNM), 7-IX-1906 (1: AMNH), Plummer's Island, 1908, R. P. Currie (1 ♂:USNM), opposite Plummer's Island, 18-VIII-1919 (1 ♀:USNM); District of Columbia, (1♀:MCZ); Ohio, Meigs Co., Syracuse, 17-V-1934, W. C. Stehr (1 ♂:CNC); Wisconsin, Waukesha Co., Big Bend, Fox River banks, 2-IX-1976, P. M. Hammond (2:BMNH); Illinois, Union Co., Pine Hills Field Station, 15-22-V-1967, J. M. Campbell (3:CNC); Henry Co., Algonquin, 21-VII-1908, Nason (1 ♀:INHS), 24-VII-1908, Nason (1 ♂:INHS); Kansas, F. H. Snow (1♂:MCZ); Douglas Co., Lawrence, R. Thaxter (1 ♂:MCZ), Colorado, (1 ♂:MCZ); North Carolina, Mecklenburg Co., Charlotte, 16-VII-1970, J. F. Cornell (1 ♂:IM); Wake Co., Umstead State Park, near Raleigh, 6-8-IX-1967, J. M. and B. A. Campbell (1 ♂CNC); South Carolina, Beaufort Co., Bluffton, 30-VI-1969, u.v. light trap, R. W. Sanders (1♂, 2♀♀:FSCA), 11-VIII-1969, u.v. light trap, R. W. Sanders (1♀:FSCA), 25-IX-1969, u.v. light trap, R. W. Sanders (1 ♀:FSCA); Georgia, Chatham Co., Savannah, 16-VII-1970, u.v. light trap, D. Cline (1 ♀:FSCA); Tift Co., Tifton, 25-VII-1969,

T. Fincher (1 ♂:FSCA); Florida, Alachua Co., Austin Cary Forest, VI-IX-1969, u.v. light trap, L. A. Hetrick (1 ♂:FSCA); Calhoun Co., Chipola River at hwy. 20, 4-X-1972, P. H. Carson (1 ♂:IM); Marion Co., 9 mi. S.S.W. of Ocala, 21-V-1975, u.v. light trap, N. Holler and R. E. Woodruff (8:FSCA); Wakulla Co., 1 mi. No. of Spring Creek, 16-VI-1973, u.v. light trap, C. W. O'Brien (1 ♂;JHFC); Alabama, Escambia Co., Atmore, VI-1962, u.v. light trap, Blanton (1 ♂, 5♀♀:FSCA); Mississippi, Harrison Co., Long Beach, Gulf Park College, 26-VI-1968, u.v. light trap, L. H. Williams (1 ♂, 1 ♀:FSCA); Texas, Lee Co., Lexington, VII-1908, Birkmann (1 ♀:INHS).

REMARKS: This has been a problematical species since its original description. The distribution was given by LeConte (1863) as: "Western States, Lake Superior; found also at Fort Yuma and San Diego, California"; the lectotype bears a yellow disc which was used by LeConte (J. F. Lawrence *in litt.*) to indicate collection locality as "Central Valley, Ill., Mo., etc." Selection of the lectotype was made from the 5 examples in LeConte's collection in MCZ, all of which bear the yellow locality disc. The apparent conflict is resolved when it is realized that, at the time of publication (1863) the states of the Central Valley (Illinois, Missouri, Kansas, Iowa) were the western states of the U.S.A., because the areas westward had not yet achieved that status. However, there seems to be no way of restricting the type locality beyond that indicated by the yellow disc.

It seems that LeConte identified all "parti-colored" adults he saw as *paederoides*, thus the species came to be recorded, erroneously, from California.

Horn (1884) assigned other "parti-colored" adults to 2 new species, *jucundus* and *jocosus*, and noted a difference between eastern and western "forms" of *paederoides*. Horn did not pursue the separation of the western "forms" as another distinct species, thus erroneous records of *paederoides* from the west have persisted in the literature. The western "forms" are much more closely related to Horn's *jucundus* than to *paederoides*, but belong to a distinct species, *occidentoides*.

N. paederoides adults are similar in habitus to those of *jocosus*. Aedeagi in these 2 species are distinct and provide the most reliable means of separation. Other differences are that *paederoides* adults are smaller, with punctures of head and pronotum less dense and less coarse, head more transverse, eyes larger and more prominent, pale apical margin of elytra more distinct, and microsculpture of head and pronotum less distinct.

N. ludicrus group

DIAGNOSIS: Head of ♂ without frontal fovea; paramere of aedeagus undivided, reduced and fused to median lobe (fig. 26-28), without peg setae; microsculpture of head scarcely evident; anterior transverse depressions of terga III-VI with tuberculate punctures, but these not coarse, not very evident.

10. *Neobisnius humilis* (Erichson)

(fig. 30, map 10)

Philonthus humilis Erichson. 1840:512 (type locality: Puerto Rico); Chevrolat and Fauvel, 1863:435; Wolcott, 1924:78, 1936:197.

Erichsonius humilis (Erichson); Fauvel, 1874:427; Blackwelder, 1943:441, 1944:131.

Neobisnius humilis (Erichson); Bernhauer and Schubert, 1914:323; Leng and Mutchler, 1914:406; Bierig, 1933:50; Smetana, 1963:4.

Neobisnius margipallens Bernhauer and Schubert, 1914: 323 (synonymy established by Bernhauer and Schubert, *loc. cit.*, by confusion with *Lathrobium margipallens* DuVal).

Neobisnius limbatus Cameron, 1922:118 (type locality: Haiti, L'Ouest, Carrefour); Scheerpeltz, 1933:1327; (synonymy established by Blackwelder, 1943:441).

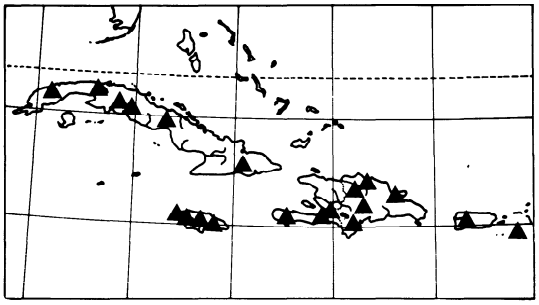
Erichsonius limbatus (Cameron); Blackwelder, 1943:441, 1944:131.

TYPES: Lectotype ♂ of *Philonthus humilis* in ISZ according to Smetana (1963), not examined by me. Four paratypes of *Neobisnius limbatus* in Cameron's collection in BMNH with labels as follows: 1) paratype [in yellow circle on disc]/Carrefour stream shingle IV.08 [in handwriting]/Haiti Dr. Cameron/M. Cameron Bequest B. M. 1955:147/[♂]; 2) paratype [in yellow circle on disc] /♂/Haiti Dr. Cameron/ M. Cameron Bequest B. M. 1955:147/; 3) as 2) but without ♂ label; 4) paratype [in yellow circle on disc]/Haiti M. Cameron 1920:324/Haiti Dr. Cameron/*limbatus* Cam./.

DESCRIPTION: Length 3.5-3.7 mm. Head castaneous, pronotum flavo-castaneous; elytra castaneous with pale apical border; abdomen castaneous, with apical border of each segment flavescent; legs and trophi flavous; antenna flavous with articles IV-XI infuscate.

Head quadrate, not much narrowed behind eyes; eye about 0.4 of length of side; moderately densely and coarsely punctate with only a faint trace of strigulose microsculpture between punctures; head of male without trace of longitudinal depression (and without frontal fovea). Pronotum elongate; narrowed posteriorly; anteriorly as broad as head behind eyes; with punctures and microsculpture much as on head. Elytra not much narrower than pronotum; longer than jointly broad; slightly broader posteriorly; finely and densely punctate. Abdomen scarcely narrower than elytra; broader toward segments VI-VII; finely punctate except in anterior transverse depressions of terga III-VI which have tuberculate punctures. Apical notch of sternum VIII broad and deep. Article II of antenna scarcely broader than III; penultimate article quadrate to slightly transverse. Aedeagus as in fig. 26.

DISTRIBUTION (map 10): Greater Antilles and St. Croix.



Map 10. Distribution of *N. humilis* in the Greater Antilles

RECORDS: JAMAICA: Surrey, St. Thomas Par., Trinityville, 28-II-1937, flying at dusk, E. A. Chapin and R. E. Blackwelder (3:USNM); St. Andrew Par., 1.9 mi. E. of Gordon Town, 30-I-1972, gravel bank of stream, J. H. Frank and A. C. Schaaf (1:JHFC), 3-III-1972, gravel bank of stream, J. H. Frank (1:JHFC), Kingston, 14-II-1928, P. J. Darlington (1:MCZ); Middlesex, St. Catherine Par., Spanish Town, 2-II-1937, flying at dusk, E. A. Chapin and R. E. Blackwelder (2:USNM), Caymanas Estate, 3-II-1937, sandy bank of Rio Cobre, E. A. Chapin and R. E. Blackwelder (1:USNM), Caymanas Estate, Dawkins, 27-VIII-1969, u.v. light trap, J. H. Frank (17:JHFC), Hellshire Hills, Lancewood Valley, 31-VIII-1-IX-1970, u.v. light trap, J. H. Frank (5:JHFC), Twickenham Park, 24-25-III-1970, u.v. light trap, E. G. Farnworth (2♂♂JHFC), 8-V-1970, u.v. light trap, E. G. Farnworth (12:JHFC), Worthy Park, 11-IX-1968, u.v. light trap, R. E. Woodruff (1 ♀:FSCA), 11-V-1969, u.v. light trap, R. E. Woodruff (1:FSCA), 2.2 mi. N. of Worthy Park, on Camperdown Road, 10-V-1969, u.v. light trap, R. E. Woodruff (1 ♀:FSCA); Clarendon Par., 1 mi. E. of May Pen, 26-II-1937, on muddy bank of pond, E. A. Chapin and R. E. Blackwelder (2:USNM), Milk River, 25-II-1937, flying at dusk, E. A. Chapin and R. E. Blackwelder (11: USNM), Milk River Bath, 19-XI-1968, u.v. light trap, R. E. Woodruff (1:FSCA), New Yarmouth Estate, 30-VII-1969, in semi-dry irrigation ditch, J. H. Frank (3:JHFC); Manchester Par., Mandeville, 19-21-IX-1969, u.v. light trap, J. H. Frank (1 ♂:JHFC), 19-21-XI-1970, u.v. light trap, J. H. Frank (1♂:JHFC), Auchtembeddie, at mouth of Oxford Cave, 19-VII-1970, u.v. light trap, J. H. Frank and J. Farradane (8:JHFC); 0.5 mi. S. E. of Troy, 30-XII-1971, in gravel of river bank, J. H. Frank (4:JHFC); St. Ann Par., Moneague, 26-VIII-1934, P. J. Darlington (1:MCZ); Cornwall, St. Elizabeth Par., Santa Cruz, 24-II-1937, flying at dusk, E. A. Chapin and R. E. Blackwelder (2:USNM), about 5 mi. W. of Black River, 24-II-1937, on muddy bank of pond, E. A. Chapin and R. E. Blackwelder (8:USNM); Westmorland Par., Crystal Waters Beach, 20-XI-1969, u.v. light trap, R. E. Woodruff (1 ♂:FSCA); Trelawny Par., Good Hope, 11-VIII-1966, H. F. Howden (4:CNC), Barbecue Bottom, 13-VIII-1966, H. F. Howden (2:CNC), Duncans, 21-VIII-1966, H. F. Howden (1:CNC), Vale Royal, 1-2-X-1969, u.v. light trap, J. H. Frank and R. Arscott (1 ♀:JHFC); CUBA: Camagüey, Baraguá, Chucho Blanco, F. G. Rambousek (2:BMNH); Cienfuégos, Soledad, 1-XII-1926, P. J. Darlington (1:MCZ), IV-1936, P. J. Darlington (3:MCZ; 4:USNM); Havana, Almendáres, 11-X-1928, A. Bierig (1:USNM); Oriente, Cauto El Cristo, Cauto River, 12-VIII-1936, P. J. Darlington (2:USNM); 3:MCZ); Pinar del Río, Rangel Mountains, 24-VIII-1936, about 450 m, P. J. Darlington (1:USNM); Aspiro, 3-VI-1934, A. Bierig (1 ♀:BMNH), Santa Clara, Cayámas, E. A. Schwarz (1:USNM); HAITI: Le Sud, Camp Perrin, 8-27-X-1934, P. J. Darlington (1:MCZ); L'Ouest, about 5 mi. W. of Ganthier, 26-XI-1970, J. H. Frank and T. A. Jenssen (2:JHFC), Carrefour, IV-1908, M. Cameron (4 paratypes of *Neobisnius limbatus* Cam.); DOMINICAN REPUBLIC: Barahona, Barahona, IX-1938, P. J. Darlington (2:MCZ; 1:USNM); Puerto Plata, 25 km by road S. of Pto. Plata, VI-1938, P. J. Darlington (3:MCZ; 1 USNM); Samana, Sánchez, VII-1938, P. J. Darlington (1:MCZ); Santiago, San José de las Matas, VI-1938, 300-600 m, P. J. Darlington (3:MCZ; 2:USNM), 900-1,200 m, P. J. Darlington (1:USNM); La Vega, Constanza, VIII-1938, 900-1,200 m, P. J. Darlington (2:MCZ); PUERTO RICO: Ponce, Jayuya, 28-I-1933, on cucumber, R. G. Oakley (1 ♀:USNM); U.S. VIRGIN ISLANDS: St. Croix, between Sugar Bay and Frederiksted, 29-IX-1936, flying at dusk, R. E. Blackwelder (1 ♂:USNM).

REMARKS: The most closely related congener of this species appears to be *ludicrus*, which is not sympatric. Darker color forms of *ludicrus* resemble *humilis* adults, but the aedeagi are distinct (fig. 27 cf. fig. 26). *N. demmeli* occurs within the range of *ludicrus*, but its adults are more depressed, with smaller eyes, and with distinct aedeagus (fig. 36 cf. fig. 26).

Smetana (1963) examined the holotype of *humilis* and illustrated the aedeagus. I have examined neither the holotype of *humilis* nor that of *limbatus*, but the 4 paratypes of *limbatus* in BMNH differ in no respect from typical *humilis*, and I believe Blackwelder (1943) was correct in establishing the synonymy. However, Blackwelder (1943) also placed *nigrocoeruleus, funerulus*, and *demmeli* in synonymy with *humilis*, but I believe these species are distinct, and I remove them from synonymy.

The name *Neobisnius margipallens* Bernh. and Schub. is apparently an error for *Lathrobium margipallens* DuVal, 1857, and was placed in synonymy with *humilis* by Bernhauer and Schubert (1914), so it is an objective synonym of *humilis*.

I believe that the locality name Carrefour together with the date, both in handwriting, on the label of 1 of the paratypes of *limbatus* Cam., to be sufficient reason to infer that the type locality of *limbatus* is Carrefour in the Department de L'Ouest, Haiti.

11. *Neobisnius ludicrus* (Erichson)

(fig. 8, 27, map 11)

Philonthus ludicrus Erichson, 1840:514 (type locality: "Guyana Venezuelensis").
Erichsonius ludicrus (Erichson); Fauvel, 1874:427; Blackwelder, 1944:131.
Neobisnius ludicrus (Erichson); Bernhauer and Schubert, 1914:323; Scheerpeltz, 1933:1327.
Philonthus umbripennis LeConte, 1863:38 (type locality: "Middle States" of U.S.A.).
Erichsonius umbripennis (LeConte); Fauvel, 1874:427.
Actobius umbripennis (LeConte); Horn, 1884:233.
Neobisnius umbripennis (LeConte); Bernhauer and Schubert, 1914:324; Leng, 1920:106; Notman, 1920b:705. NEW SYNONYMY.
Philonthus deletus Sharp, 1876:167 (type locality: Brazil, Pará, Tapajos); Blackwelder, 1944:132. NEW SYNONYMY.
Neobisnius fauveli Smetana, 1963:2 (type locality: U.S.A., Louisiana). SUBSPECIES, NEW STATUS.

Two subspecies are recognized: *l. ludicrus* (Erichson) and *l. fauveli* Smetana.

TYPES: Lectotype ♂ of *Philonthus ludicrus* in Erichson's collection in ISZ with labels: 6194/*ludicrus* Er. Venezuela Mor. [green paper]/*Philonthus ludicrus* Er. lectotype J. H. Frank/; paralectotype female in same collection, originally without any labels, to which I have added a label: *Philonthus ludicrus* Er. paralectotype J. H. Frank/. Supposed holotype female of *Philonthus umbripennis* in LeConte's collection in MCZ with labels: [pink disc]/♂/Type 6286/*A. umbripennis* LeC/. The type series of *Philonthus deletus* consists of 4 specimens labeled: Amazons/Tapajos/with Sharp's name labels in Sharp's collection in BMNH, not examined by me but examined for me by P. M. Hammond. Holotype ♂ of *Neobisnius fauveli* in Fauvel's collection in IRB, labelled: Louisiane/*agnatus* Horn non Er. type/*Horni* Fvl./R.I.Sc.N.B. 17.479 Coll. et det. A. Fauvel/Ex-Typis/HOLOTYPUS *Neobisnius fauveli* 1963 Smetana det./; also a paratype ♂ (not seen by me) labelled as described by Smetana (1963).

DESCRIPTION: Length 4.0-4.3 mm. Typical form with head dark castaneous to piceous; pronotum flavo-rufous to rufous; elytra dark castaneous to piceous, with broadly rufescent or flavescent apical margin, and with suture and scutellum rufescent in some examples; abdomen flavo-rufous to rufous but with disc of terga VII-VIII darkly infuscate and in many individuals with disc of remaining terga more or less infuscate; trophi and legs flavous; articles I-III of antenna flavo-rufous and remaining articles darkly infuscate. Dark colored individuals (pronotum dark castaneous; abdominal segments piceous except for rufescent apical margins; head and elytra piceous except for rufescent apical margin of elytra) occur in 2 geographical areas: northwestern Florida to Texas (U.S.A.), and Panama-Costa Rica; the former are considered here as subspecies *l. fauveli*.

Head quadrate, scarcely narrowed behind eyes; eye occupying 0.35 length of side; moderately coarsely but sparsely punctate; without strigulose microsculpture. Pronotum elongate; anteriorly as broad as head behind eyes; scarcely sinuate laterally, narrowed posteriorly; sparsely punctate, particularly laterally. Elytra longer than jointly broad; not much broader than pronotum; broader posteriorly; finely and rather sparsely punctate. Abdomen not much narrower than elytra; finely and sparsely punctate; terga III-VI each with a transverse anterior depression with tuberculate punctures, apical notch of sternum VIII of ♂ as deep as broad. Article II of antenna scarcely broader than III; penultimate article quadrate to slightly transverse. Aedeagus as in fig. 27.

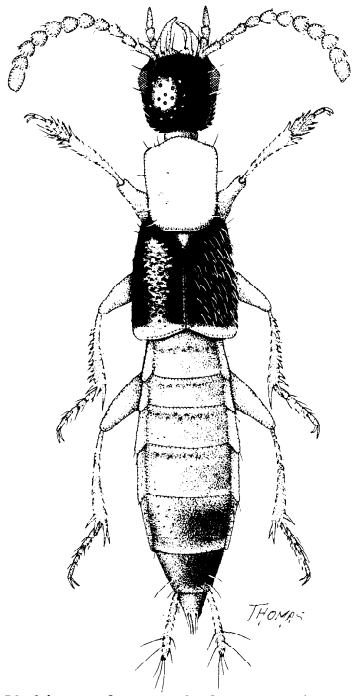
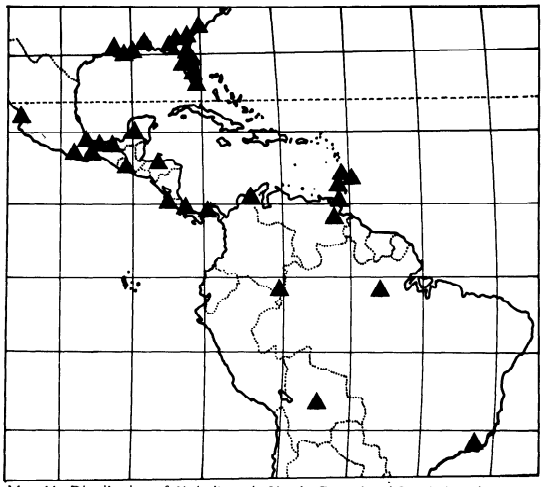


Fig. 8. Habitus of ♂ *N. ludicrus* (Erichson). Length 4.0-4.3 mm.

DISTRIBUTION (map 11); Southeastern United States, southern Mexico south to northern South America and lesser Antilles.



Map 11. Distribution of *N. ludicrus* in North, Central and South America, and the Lesser Antilles

RECORDS: U.S.A.: South Carolina, Beaufort Co., Bluffton, 2-VI-1969, u.v. light trap, R. W. Sanders (1 ♂:FSCA), 25-IX-1969, u.v. light trap, R. W. Sanders (5 ♂♂, 6 ♀♀:FSCA); Georgia, Charlton Co., Okefenokee Swamp, 30-VII-1948 (1:SMKU): Colquitt Co., 15 mi. S. E. of Moultrie, 23-VI-1969, u.v. light trap, E. Mercer (1 ♂, 3 ♀♀:FSCA); Tift Co., Tifton, 25-VII-1969, u.v. light trap, T. Fincher (2♂♂, 1 ♀:FSCA); Lowndes Co., 28-XI-1963, u.v. light trap, E. I. Hazard (6 ♀♀:FSCA); Ware Co., 8 mi. S. of Waycross, 16-VI-1953, E. S. Ross (1 ♂:CAS); Glynn Co., St. Simon's Island, 21-VII-1931, C. A. Frost (6:MCZ); Florida, Duval Co., Atlantic Beach, A. T. Slosson (1:AMNH), Jacksonville, pebbly beach (1:AMNH); Volusia Co., Enterprise, 10-X (1:AMNH), 22-V (1:SMKU), 26-V (1:MCZ), 7-VI (1:MCZ), 9-VI (1:MCZ), 22-VI (1:MCZ), 22-XI (21:AMNH), Ormond, A. T. Slosson (2:AMNH; 1:MCZ), Coronado Beach, 12-III-1939, C. A. Frost (1:MCZ); Orange Co., Winter Park, 1-V, E. M. Davis (5:MCZ); Brevard Co., Sand Point, 18-VI, H. G. Hubbard and E. A. Schwarz (1: USNM); Osceola Co., Kissimmee (1:MCZ), Lake Marian, 15-III-1968, Howden and Howell (1:CNC); Polk Co., Weohyakapka Creek at hwy. 60, 5-IV-1975, Berlese funnel extract of plant debris on shore of creek, J. H. Frank (6:JHFC); Indian River Co., about 5 mi. S. of Vero Beach, 15-V-1973, u.v. light trap at edge of salt marsh, J. H. Frank (7:JHFC), Sebastian, IV, G. Nelson (6:MCZ); St. Lucie Co., Capron, 30-III (1:SMKU), 13-IV (2♂♂:USNM), 14-IV (6:USNM; 1:AMNH), 22-IV, H. G. Hubbard and E. A. Schwarz (1:SMKU; 2:USNM), Lakewood Park, 5-V-1973, u.v. light trap near drainage canal, J. H. Frank (23:JHFC); Okeechobee Co., about 5 mi. S.E. of Okeechobee, 15-X-1972, under debris on shore of lake, J. H. Frank (5:JHFC); Martin Co., Port Mayaca, 13-III-1939, F. E. Lutz (1:AMNH); Palm Beach Co., Lake Worth, A. T. Slosson (1:AMNH), Belle Glade, Burkes property, 26-V-1972, u.v. light trap, C. E. Nelson (7♂♂, 7♀♀:FSCA); Broward Co., Deerfield, 26-VII-1948, L. D. Beamer (1:SMKU), E. L. Todd (2: SMKU), Hollywood, 12-V-1967, D. E. Bright (1:CNC); Dade Co., Biscayne Bay, A. T. Slosson (5:AMNH; 2: MCZ), Homestead, 11-V-1967, D. E. Bright (3:CNC), Coopertown, 29-II-1968, A. Smetana (1:CNC); Monroe Co., Everglades National Park, Flamingo Prairie, 23-III-1970, u.v. light trap, R. M. Baranowski (1♂, 2♀♀:JHFC); Collier Co., Naples, 25-III-1947, J. W. Green (1:CAS); Hendry Co., hwy. 78 at Fisheating Creek, 13-IV-1975, under debris on shore of creek, J. H. Frank (11:JHFC); Glades Co., Palmdale, 27-IV-1967, D. E. Bright (3:CNC); Highlands Co., Sebring, 7-12-III-1939, F. E. Lutz (4:AMNH), Lake Placid, 1-IV-1947, J. W. Green (1:CAS), 2-IV-1947, J. W. Green (2:CAS), 13-VIII-1948, R. T. McDermott (2:SMKU), L. D. Beamer (2:SMKU), 15-VII-1948, R. T. McDermott (4:SMKU), 16-VII-1948, R. W. Crowder (2:SMKU), Grassy Lake, 18-II-1975, on shore of lake, J. H. Frank (7:JHFC), Archbold Biological Station, 22-IV-1967, D. E. Bright (6:CNC), 23-IV-1967, D. E. Bright (3:CNC), 24-IV-1967, D. E. Bright (4:CNC), 9-13-III-1968, A. Smetana (10:CNC), 2 mi. N. of Archbold Biological Station, 26-IV-1967, D. E. Bright (1:CNC), Lake Istokpoga, 6-III-1968, A. Smetana (6:CNC), 12-III-1968, A. Smetana (2:CNC); Hardee Co., Highlands Hammock State Park, 25-IV-1967. D. E. Bright (1:CNC); DeSoto Co., Arcadia, 18-II-1975, under debris on shore of Peace River, J. H. Frank (4:JHFC); Sarasota Co., Myakka River State Park, 18-II-1975, under debris on shore of Lake Myakka, J. H. Frank (2:JHFC); Manatee Co., Parrish, 9-VII-1948, R. T. McDermott (1:SMKU); Hillsborough Co., Plant City, 15-VIII-1930, J. O. Nottingham (1:SMKU); Pinellas Co., Belleair, A. T. Slosson (2:AMNH), Dunedin, W. S. Blatchley (3:BMNH); Pasco Co., Lacoochee, 7-VII-1948, E. L. Todd (1:SMKU); Citrus Co., Detroit, D. M. Castle (1:CAS); Alachua Co., Archer, III-1882 (1 ♂: USNM), Austin Cary Forest, VI-IX-1969, u.v. light trap, L. A. Hetrick (1♂, 1♀:FSCA), Gainesville, 4-6-III-1967, u.v. light, D. L. Mays (1:IM), Hatchet Creek, 24-IV-1952, O. Peck (1:CAS); Calhoun Co., Chipola River at hwy. 20, 22-VI-1972, P. H. Carson (6:IM); Leon Co., Tall Timbers Research Station, Sheep Island, 19-IX-1972, C. W. O'Brien (2:IM); Liberty Co., Torreya State Park, 4-VII-1965, u.v. light trap, H. V. Weems, Jr. (1 ♀:FSCA), Apalachicola River at hwy. 20, 23-X-1971, P. H. Carson (1:IM); Alabama, Mobile Co., Mobile, VI-1937, P. J. Darlington (3:MCZ); Mississippi, Harrison Co., Long Beach, Gulf Park College, 26-VI-1968, u.v. light trap, L. H. Williams (4♂♂, 3 ♀♀:FSCA), Gulfport, Newman Lumber Co., 1-VII-1968, u.v. light trap, L. H. Williams (4♂♂, 3 ♀♀:FSCA); Louisiana, (holotype ♂ and paratype ♂ of *Neobisnius fauveli*:IRB); Cameron Par., 15 mi. E. of Creole, 18-VI-1948, L. D. Beamer (1♂:SMKU); St. Tammany Par., Fontainebleau State Park, on U.S. 190, 26-VIII-1964, u.v. light trap, Blanton and Broce (2 ♂♂, 5 ♀♀:FSCA), Covington, 23-VII-1948, H. W. Crowder (2:SMKU), E. L. Todd (4:SMKU); St. John the Baptist Par., Manchac, 20-III-1968, A. Smetana (4:CNC); Orleans Par., Harahan, 20-V-1944, F. G. Werner (1:MCZ), 26-VI-1944, F. G. Werner (2:MCZ), 25-VII-1946, F. G. Werner (1:MCZ), Camp Plauche, 9-IX, F. N. Young (9:MCZ); Texas, Orange Co., Vidor, 15-VI-1970, B. Phelps (1 ♀:TAMU); MEXICO: Nayarit, San Blas, 10-VI-1960, I. Moore (5:CNC); Guerrero, 6.5 mi. W. of Pie de la Cuesta, 22-XI-1965, near sea level, G. E. Ball and D. R. Whitehead (2 ♂♂, 2 ♀♀:JHFC); Veracruz, 20.4 mi. S.E. of Tecolutla, 2-VII-1966, sea beach, G. E. Ball and D. R. Whitehead (1♂, 2♀♀:JHFC), Lake Catemaco, Coyame, 10-18-VII-1963, u.v. light trap, D. R. Whitehead (1 ♂:JHFC), 4 mi. E. of Coatzocoalcos, 20-VIII-1967, u.v. light trap, H. R. Burke (1♂: TAMU), 24 mi. E. of Coatzocoalcos, 20-VIII-1967, Burke and Hafernik (1♂:TAMU), 4 mi. N.E. of Minatitlán, 11-VI-1965, at light, Burke, Meyer, and Schaffner (1♂:TAMU), 3.5 mi. S. of Tuxpan, 28-VIII-1970, Hardy and Cheary (1 ♂:IM), Barra de Náutla, 16-VII-1973, beach debris, A. F. Newton (2♂♂:AFN); Oaxaca, 11.6 mi. W. of Jalapa del Marqués, 12-VII-1971, at light, Clark, Murray, Hart, and Schaffner (2♀♀:TAMU), 31 mi. S. of Totolapan, 21-VIII-1970, Cheary and Hardy (1:IM), route 131, 127 km S. of Oaxaca, 11-V-1971, 1,830 m, J. M. Campbell (2:CNC); Tabasco, Villa Hermosa, 4-VII-1963, at light, R. E. Woodruff (1 ♂:FSCA), Frontera, 23-VI-1969, D. E. Bright and J. M. Campbell (22:CNC); Campeche, 31.8 mi. E. of Escarcega, 14-15-IV-1966, 60 m, G. E. Ball and D. R. Whitehead (3♂♂, 1♀:JHFC); GUATEMALA: Escuintla, Paso Antonio, 120m, H. G. Champion (1 ♂, 1♀:BMNH); HONDURAS: Atlántida, Lancetillo, M. Bates (1 ♂:MCZ); COSTA RICA: Guanacaste, El Viejo, 22-VII-1979, in drainage ditch, J. H. Frank (6: JHFC); Limón, Moin, 30-VII-1979, u.v. light trap, J. H. Frank (1♂:JHFC); PANAMA: Canal Zone, Limon Plantation, Chagres River, 14-VII-1918, sweepings around cornfield, Dietz and Zetek (1 ♂:USNM); COLOMBIA:

Magdalena, Parque Tayrona, 21 mi. E. of Santa Marta, 15-V-1973, H. F. Howden and J. M. Campbell (2:CNC); Amazonas, Leticia, 19-25-II-1972, 210 m, R. H. Parry (1 ♂:CNC); BOLIVIA: Santa Cruz, Saavedra Research Station, 10-IV-1978, u.v. light trap, H. Serrate (1 ♂: JHFC); VENEZUELA: [? Bolivar, "Guyana Venezuelensis"], Moritz (lectotype ♂ and paralectotype ♀ of *Philonthus ludicrus*:ISZ); TRINIDAD and TOBAGO: Trinidad, St. George Co., St. Augustine, IV-1929, P. J. Darlington (1 ♀:MCZ); ST. LUCIA: Anse-la-Raye, Roseau River, 29-III-1936, under stones and sand along stream, R. E. Blackwelder (3:USNM), Millet River, 3-IV-1936, under stones and sand along stream, R. E. Blackwelder (3:USNM); M. Cameron (1 ♀:BMNH); BARBADOS: St. Peter, Whitehall Estate, 14-III-1936, on mud bank of small pond, R. E. Blackwelder (5: USNM); ST. VINCENT: St. Andrew, 6 mi. N. of Kingstown, Buccament River, 6-II-1936, under stones along stream, R. E. Blackwelder (4:USNM), 15-II-1936, R. E. Blackwelder (2:USNM); Charlotte, Yambou River, under stones on gravel bar, R. E. Blackwelder (4:USNM); "South End", probably St. George Par., H. H. Smith (2♂♂, 2 ♀♀:BMNH); GRENADA: St. George, Mount Gay Estate, H. H. Smith (4:USNM; 1♂:BMNH), St. John's River, H. H. Smith (1♂:BMNH), St. Andrew, Balthazar, H. H. Smith (1♂:BMNH), Chantilly estate, H. H. Smith (1♂:BMNH), Grand Etang, H. H. Smith (1♂:BMNH); BRAZIL: Pará, Tapajos (type series of *Philonthus deletus* Sharp:BMNH), Fazenda Taperinha, 16-18-XI-1969, J. M. and B. A. Campbell (2:CNC); Rio de Janeiro, Rio de Janeiro, Squires (1♂, 2 ♀:BMNH).

REMARKS: The type locality of *Philonthus ludicrus* Er., "Guyana Venezuelensis", possibly indicates the region of Santo Tomé de Guayana in the state of Bolivar, in eastern Venezuela. The species represented by the above type is certainly the same as is found in Brazil, the southern Lesser Antilles, Central America, and southern Mexico, even though the 2 examples from Guatemala were standing in Sharp's collection in BMNH under the name *Actobius delicatulus* Sharp. The United States population appears not to be continuous with the Mexican population, though further collections should be obtained to verify this. However, examples from South Carolina, Georgia, and peninsular Florida seem to be identical to examples from southern Mexico and, in turn, are of the same species as represented by the supposed holotype of *Philonthus umbripennis* LeC. labelled with a pink disc which indicates the collection locality (J. F. Lawrence, *in litt.*) as "Middle States". The published distribution was also given by LeConte (1863) as "Middle States", and he wrote that he had only a single, ♂ example (the holotype). The supposed holotype also bears a small label with a ♂ sign; it agrees with LeConte's description except that it is a female. LeConte's collection (in MCZ) also contains 2 other examples of the species labelled "Fla.", presumably added after 1863. Judging only by recent collection records, whatever LeConte meant by "Middle States" (the dictionary definition includes New York, New Jersey, Pennsylvania, Delaware, and Maryland) are outside the present known range of the species (he used an orange disc to indicate "Southern States"), but he did indicate the species was "rare" (in 1863) in "Middle States".

The comments by Horn (1884), who knew LeConte and exchanged specimens with him, throw some light on the dilemma, for Horn gave the distribution as "from Pennsylvania to Florida" and noted that the ♂ of the species was unknown to him. If Horn had not seen a ♂, he must have examined only a very few specimens, perhaps only those in LeConte's collection, namely the holotype, and the 2 examples from Florida. It seems reasonable to suggest that the holotype was from Pennsylvania and that Horn or LeConte had, by 1884, realized that it was a ♀ example, not a ♂. Despite the fact that it is a ♀, it cannot readily be confused with examples of any other North American species, and I have no hesitation in placing it as conspecific with the abundant examples from Florida and the latter, in turn, with examples of *Neobisnius ludicrus*.

Horn (1884) described a species from Louisiana which he stated had been identified by Fauvel as *Philonthus agnatus* Er. Examples of this species, in Fauvel's collection in IRB, were re-examined by Smetana (1963), who distinguished them from *Neobisnius agnatus* (Er.) and described them as a new species, *Neobisnius fauveli* Smetana. I have examined the holotype ♂ of *fauveli* and find it identical to *ludicrus* except in color, which is markedly darker. All the examples of *ludicrus* I have seen from Louisiana, Texas, Mississippi, and Alabama are of this dark color form, as are some of the examples from northwestern Florida. Other examples from northwestern Florida and some from peninsular Florida are of an intermediate color pattern. I believe that *fauveli* Smetana should be recognized as a distinct subspecies which occurs on the Gulf Coast of the U.S.A., between northwestern Florida and eastern Texas, and whose individuals interbreed with those of the typical subspecies in a boundary zone in northern Florida.

It is possible that the U.S.A. population was introduced from southern Mexico, from the Lesser Antilles, or from the northeastern coast of South America. Ocean currents exist which could have provided the means of dispersal directly to Florida from any of these land areas (Woodruff, 1973:5) and the riparian habitat makes individuals of this species likely candidates for waterborne dispersal. The trade route north of Cuba and south of Florida has been used by ships sailing for Europe since the early days of the Spanish Empire, more recently by ships heading for the east coast of North America (perhaps even to Pennsylvania in the case of *ludicrus*), and many ships were wrecked on the Florida coast while doubtless more went into port there when the territory was a Spanish possession; commerce could therefore offer an additional means of dispersal for insects from Central America. The species has not been recorded from the Greater Antilles. This hypothesis, implying a single introduction from a neotropical area into Florida, appears less complex than the alternate hy-

pothesis which would imply the former existence of a continuous population from Mexico to the United States, and its subsequent disruption. However, the latter hypothesis should be preferred in the general context of the interpreted history of the biota of the southeastern United States.

The specimen from Panama and some of the specimens from Costa Rica (both Limón and Guanacaste) are as dark as typical *l. fauveli*, while intermediately colored specimens also were collected in Costa Rica. I have not named this dark population as a subspecies, because it may be the population named as *flavipes* Bierig, whose status needs clarification.

Specimens from Rio de Janeiro, Brazil, in BMNH, are labelled *Philonthus deletus* Sharp. After I had examined these specimens and determined that they belong to *ludicrus*, I returned them to BMNH. There, P. M. Hammond kindly compared them with the type series of *P. deletus* and informed me (*in litt.*) that he believes that all 7 specimens are conspecific. Thus, I have no hesitation in placing *P. deletus* Sharp as a synonym of *ludicrus*.

12. *Neobisnius lepidulus* (LeConte)

Philonthus lepidulus LeConte, 1863:37 (type locality: U.S.A., "Georgia near the mountains").
Actobius lepidulus (LeConte); Horn, 1884:233.
Neobisnius lepidulus (LeConte); Bernhauer and Schubert, 1914:323; Leng, 1920:106.

TYPES: Holotype ♀ in LeConte's collection in MCZ with labels: [orange disc]/Type 6287/*A. lepidulus* LeC./.

DESCRIPTION: Length 3.3 mm. Head castaneous, pronotum flavo-castaneous; elytra including scutellum castaneous with narrow, flavescent apical margin; terga castaneous with apical margin of each segment slightly flavescent; legs and trophi flavous; antenna flavo-castaneous with articles IV-XI infuscate.

Head narrowed behind prominent eyes; eye occupying 0.4 of length of side; very sparsely punctate and shining; without microsculpture; head of ♀ without longitudinal depression, ♂ unknown. Pronotum elongate, slightly sinuate laterally; narrowed posteriorly; anteriorly wider than head at hind angles; sparsely punctate, shining, without distinct microsculpture. Elytra longer than jointly broad; not much broader than pronotum; slightly broader posteriorly; sparsely punctate, shining. Abdomen not much narrower than elytra; transverse depressions of terga III-VI with tuberculate punctures. Article II of antenna scarcely broader than III; penultimate article quadrate to slightly transverse.

DISTRIBUTION: U.S.A., northwestern Georgia.

RECORDS: U.S.A., Georgia, (holotype ♀:MCZ).

REMARKS: The holotype is the only example of this species I have seen. In June 1978, I spent 3 days collecting in White Co. and adjoining counties in northern Georgia, but found only *sobrinus*, not *lepidulus*.

This species is distinct from all other United States species in the very small size, strongly narrowed head, and very sparsely punctate surface. Because I have seen no ♂ examples, I can only guess at the affinities to other species. Apart from a possible relationship to *ludicrus*, a conceivable relationship to *nitidulus* might be suggested.

Philonthus lepidulus LeConte was transferred to *Actobius* by Horn (1884), thence to *Neobisnius* by Bernhauer and Schubert (1914). *Quedius lepidulus* Stephens, 1832, was transferred to *Philonthus* by Bernhauer and Schubert (1914) (*fide* Blackwelder, 1967), so secondary homonymy does not exist, and no name change is required under the International Rules of Zoological Nomenclature.

13. *Neobisnius flavipes* Bierig

(map 12)

Neobisnius flavipes Bierig, 1933:50 (type locality: Panama, Chiriquí, Puerto Armuelles).
Erichsonius flavipes (Bierig); Blackwelder, 1944:131.

TYPES: Holotype and paratypes originally in Bierig's collection, not in FMNH, not in ISZ, present location unknown to me.

DESCRIPTION: The description following is translated from the original description given by Bierig (1933). Length 4.3-4.8 mm. Shining nigropiceous; pronotum, elytral suture and apical margins of abdominal terga piceorufous; antenna testaceous, its 1st 2 or 3 basal articles, labrum, clypeus, palpi, posterior margin of the elytra and legs flavo-testaceous.

Head quadrate, narrowed behind eyes which are notably shorter than the temporal region; punctation rather sparse and coarse: [head of ♂ probably without a frontal fovea]. Pronotum anteriorly as broad as head at the eyes; about 0.17 longer than broad; scarcely sinuate laterally; not much narrowed posteriorly; rather more closely punctate than head and more densely so near center line. Elytra longer than jointly broad; broader posteriorly; sparsely and finely punctate. Abdomen with fine transverse microsculpture; anterior transverse depressions of terga III-VI with tuberculate punctures; apex of sternum VIII of ♂ feebly emarginate. Antenna with penultimate article scarcely transverse.

Habitus similar to *humilis* but larger, less depressed, head more narrowed posteriorly, finer and sparser punctation, and paler antennae and legs.

DISTRIBUTION: (map 12): Northwestern Panama.

RECORDS: The only records of this species are those accompanying the original description; I have seen no examples. PANAMA: Chiriquí, Puerto Armuelles, VI-VII-1930, A. Bierig (holotype and paratypes in Bierig's collection).

REMARKS: I make the assumption that the ♂ has no frontal fovea because its presence was noted by Bierig (1933) in *cavifrons*, and it seems unlikely that he would have overlooked it in *flavipes*. The only characteristics of *flavipes* adults, stated in Bierig's (1933) description, which might serve to separate them from dark forms of *ludicrus* occurring in Panama and Costa Rica, are slightly larger size, and slightly darker color. Bierig (loc. cit.) did not mention *ludicrus*, so I assume he was unaware of its occurrence in Panama and unaware of its similarity to the types of *flavipes*. I suspect that *flavipes* is a synonym of *ludicrus* and, if so, the name *flavipes* should be reduced to the status of subspecies and applied to the dark color form occurring in southern Central America, just as *l. fauveli* is applied to the dark form occurring in the southern U.S.A. Bierig's type material, or new collections from the type locality, are required to resolve this question.

14. *Neobisnius mixtus* (Sharp)

(fig. 28, map 12)

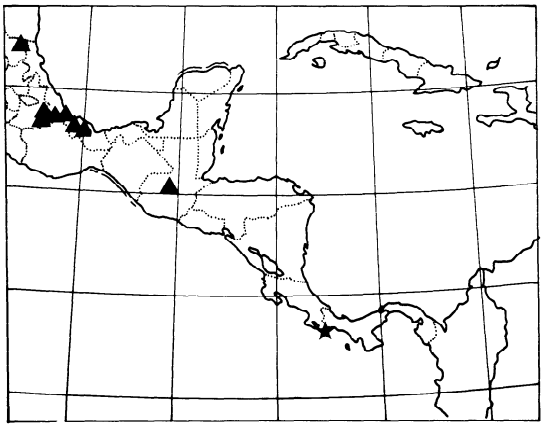
Actobius mixtus Sharp, 1885:460 (type locality: Guatemala, Baja Verapaz, San Jerónimo).
Neobisnius mixtus (Sharp); Bernhauer and Schubert, 1914:323; Bierig, 1933:56.
Erichsonius mixtus (Sharp); Blackwelder, 1944:131.

TYPES: Lectotype ♂ and 2 paralectotypes in Sharp's collection in BMNH all mounted on a single specimen card with labels: *Actobius mixtus* Types D. S. San Geronimo Guatem. Champion [written on specimen card]/Type [in red circle on disc]/Type/[in red circle on disc]/San Geronimo, Vera Paz, Champion/B.C.A. Col. I.2.*Actobius mixtus* Sharp/Sharp Coll. 1905-131/. The syntype on the right has a ♂ sign marked on the specimen card by it, and I designate this example the lectotype; I have removed the aedeagus and mounted it on the card beside the lectotype.

DESCRIPTION: Length 4.2-4.5 mm. Head dark castaneous to piceous; pronotum pale to dark castaneous; elytra dark castaneous to piceous; abdomen pale castaneous; elytra with apical margin narrowly flavescent and sutural region rufescent in some specimens; abdominal terga each with disc infuscate and with apical margin flavescent; legs flavous; trophi ferruginous; antenna with articles I, II, and base of III pale ferruginous, article XI ferruginous, and remaining articles darkly infuscate.

Head quadrate, narrowed behind prominent eyes; eye occupying 0.4 of length of side; sparsely punctate, shining between punctures and without obvious microsculpture. Pronotum anteriorly as broad as head behind eyes; elongate; narrowed posteriorly; scarcely sinuate laterally; rather sparsely punctate and without any obvious microsculpture. Elytra not much broader than pronotum; slightly longer than jointly broad; scarcely broader posteriorly; finely and sparsely punctate. Abdomen not much narrower than elytra, slightly broadened to segments V-VI; terga III-VI each with a transverse anterior depression with tuberculate punctures; apical notch of sternum VIII of ♂ narrow, deep. Tarsi distinctly shorter than tibiae. Article II of antenna scarcely broader than III; penultimate article quadrate to very slightly transverse. Aedeagus (fig. 28) with paramere reduced and fused to median lobe; the latter much more slender than in *humilis* and *ludicrus*.

DISTRIBUTION (map 12): Mexico and Guatemala.



Map 12. Distribution of *N. flavipes* (STAR) and *N. mixtus* (TRIANGLES) in Central America and Mexico

RECORDS: MEXIÇO: Puebla, Tehuacán, Höge (1 ♀:BMNH): Veracruz, Cordoba, Höge (1 ♂:BMNH), Dos Amates, 16-17-VI-1969, Bright and Campbell (2:CNC), Lake Catemaco, 30-IV-1969, Bright and Campbell (1 ♂:CNC), Orizaba, 29-IV-1969, Bright and Campbell (4:CNC), Tlacotalpam, Höge (1 ♀:BMNH), Veracruz, Höge (1 ♀:BMNH), Fortín de las Flores, Cervezeria Moctezuma, 28-IV-1963, u.v. light trap, R. E. Woodruff (1 ♂:FSCA); San Luis Potosí, 3 mi. W. of El Naranjo, 1-18-VI-1971, 305 m, sifting leaf litter, A. F. Newton (2♂♂, 2 ♀♀:AFNC); GUATEMALA: Baja Verapaz, San Jerónimo, H. G. Champion (lectotype ♂, 2 paralectotypes, and 5 ex. of *Actobius mixtus*:BMNH.).

REMARKS: This species is extremely similar in habitus to *ludicrus* and individuals may not be identified with confidence except by examination of the aedeagus; the head is slightly less narrowed behind the eyes than in *ludicrus*. The species is evidently closely related to *ludicrus*, but the form of the aedeagus separates the 2 species very clearly. The examples of *ludicrus* from Guatemala, Escuintla, Paso Antonio in BMNH were part of the series of specimens which had been placed under *mixtus* by Sharp.

Bierig (1933) recorded the species from Panama, but I have not seen the examples upon which Bierig based his identification. I believe the possibility to be good that the examples belonged to *ludicrus*.

The type locality cited by Sharp: "Vera Paz, San Geronimo", refers to San Jerónimo in the Department of Baja Verapaz, Guatemala.

N. brasilianus group

DIAGNOSIS: Head of ♂ without frontal fovea; furcae of aedeagus parallel, long (fig. 29, 30), with peg setae at apices; anterior transverse depressions of terga III-V or VI with tuberculate punctures; individuals of large size, 4.7-5.5 mm.

15. *Neobisnius brasilianus* Wendeler

(fig. 9, 29, map 13)

Neobisnius brasilianus Wendeler, 1956:230 (type locality: Brazil, Santa Catarina, Nova Teutonia).

TYPES: Holotype ♀ in ISZ with following labels: ♀/BRASILIEN: Nova Teutonia, 27° 11 B. 52° 23L., 300-500m Fritz Plaumann/*Neobisnius brasilianus* n. sp. Wendeler det./ Holotypus [pink paper]/*brasilianus* Wdlr. [in green border]/.

DESCRIPTION: Length 5.5-5.7 mm. Head, pronotum, elytra, and abdomen piceous; elytra indefinitely and narrowly flavescent at apical margin; abdominal segments III-IV basally rufescent; legs flavous but with tibiae infuscate; trophi ferruginous; antennae ferruginous but with articles IV-XI infuscate.

Head quadrate; eyes prominent, each occupying 0.35 length of side of head; head not much narrowed behind eyes; densely and coarsely punctate with strigulose microsculpture between punctures. Pronotum longer than broad; broadest at anterior angles; not noticeably sinuate laterally; closely and coarsely punctate as head; with strigulose microsculpture between punctures; at anterior angles as broad as head across eyes. Elytra longer than jointly broad; not much broader than pronotum; fairly closely punctate, but much more finely so than pronotum. Abdomen almost linear; terga III, IV, and V with tuberculate puctures in anterior transverse depressions. Apical notch of sternum VIII of ♂ slightly broader than deep. Article II of antenna scarcely broader than III. Aedeagus strikingly blunt at apex, with long parallel parameral furcae (fig. 29).

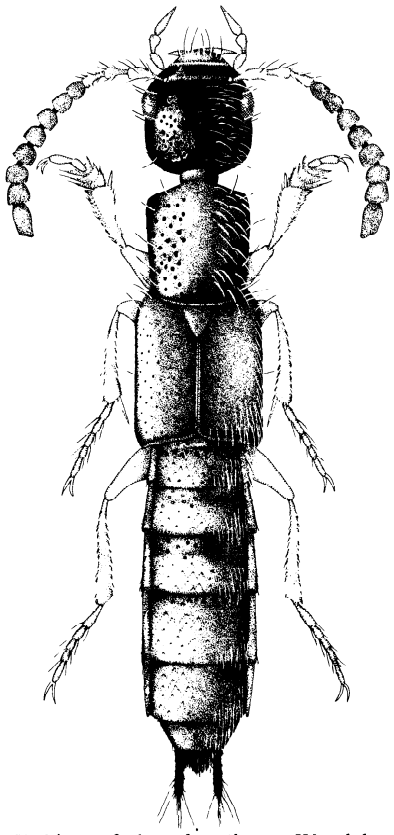
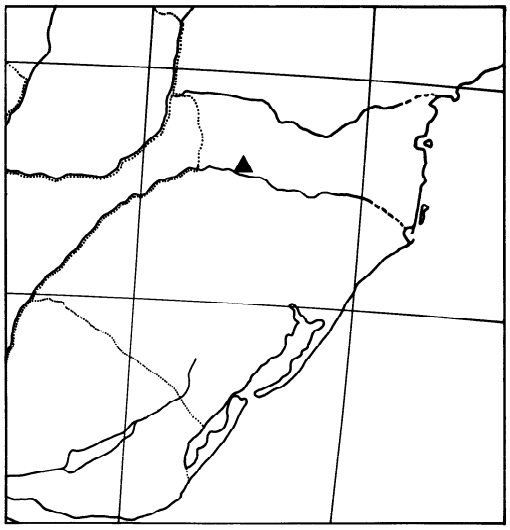


Fig. 9. Habitus of ♂ *N. brasilianus* Wendeler. Length 5.5-5.7 mm.

DISTRIBUTION (map 13): Southern Brazil.



Map 13. Distribution of *N. brasilianus* in southern Brazil

RECORDS: BRAZIL: Santa Catarina, Nova Teutonia, IV-1948, F. Plaumann (1 ♂, 2 ♀♀:MCZ), holotype ♀ of *brasilianus*, F. Plaumann (ISZ).

REMARKS: This species was described by Wendeler (1956) from the holotype ♀ alone, and the ♂ has remained unknown. Among South American species, individuals are distinguished by large size, dark color, coarse punctures, and lack of frontal fovea. They bear a superficial resemblance to Central American congeners, such as *fortis*. Apart from a close relationship to the Greater Antillean *nigrocoeruleus*, the nearest relatives may be those of the *jocosus* and *scutellaris* species groups.

16. *Neobisnius nigrocoeruleus* Cameron

(fig. 30, map 14)

Neobisnius nigrocoeruleus Cameron, 1922:118 (type locality: Jamaica, see remarks); Scheerpeltz, 1933: 1327.

Erichsonius nigrocoeruleus (Cameron); Blackwelder, 1943:441; 1944:131 (as a synonym of *N. humilis* (Erichson)).

Neobisnius carbonarius Bierig, 1933:49 (type locality: Cuba, Pinar de de Rio, Sierra del Rosario, Cayajabos).

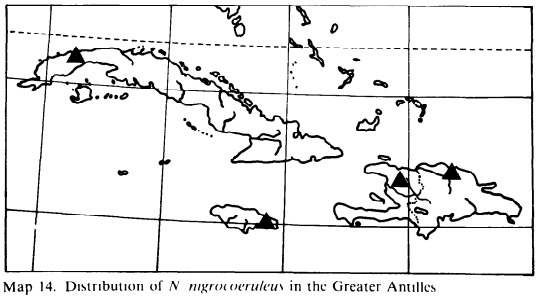
Erichsonius carbonarius (Bierig): Blackwelder, 1943:441; 1944:131 (as a synonym of *N. humilis* (Erichson)).

TYPES: Holotype ♀ of *N. nigrocoeruleus* in BMNH with labels: Type H. T. [in red circle on disc]/Jamaica Cameron/M. Cameron Bequest B.M. 1955-147/*N. nigrocoeruleus* TYPE Cam./. Holotype of *carbonarius* not examined by me.

DESCRIPTION: Length 4.7-5.0 mm. Head, pronotum, elytra, and abdomen entirely nigropiceous to nigrous; legs, trophi, and antennae piceous.

Head quadrate, narrowed behind eyes each of which occupies 0.4 of length of side of head; coarsely but not very closely punctate; surface shining between punctures and with scarcely evident microsculpture. Pronotum anteriorly as broad as head behind eyes; elongate; sinuate laterally and scarcely narrower posteriorly; coarsely but not very closely punctate; surface shining between punctures. Elytra together distinctly wider than pronotum; longer than jointly broad; broader posteriorly; coarsely punctate; shining between punctures and with a slight metallic luster which appears more blue than green or brown. Abdomen not much narrower than elytra, almost linear; terga III-VI each with a transverse anterior depression with tuberculate punctures; sternum VIII of male with a small and shallow apical notch. Legs and antennae rather long. Penultimate article of antenna quadrate. Aedeagus illustrated by fig. 30.

DISTRIBUTION (map 14): Mountains of the Greater Antilles.



Map 14. Distribution of *N. nigrocoeruleus* in the Greater Antilles.

RECORDS: JAMAICA: Surrey, St. Andrew Par., Blue Mountains, 13-20-VIII-1934, nr. 1,370 m, P. J. Darlington (1:MCZ), main range, Blue Mountains, 17-19-VIII-1934, 1,525-2,250 m, P. J. Darlington (1:MCZ), along path between Cinchona and Morce's Gap, 19-VI-1971, under rotten wood, about 1,600 m, J. H. Frank (5:JHFC), 1.9 mi. E. of Gordon Town, 30-I-1972, in gravel of river bank, J. H. Frank and A. C. Schaaf (2:JHFC); Portland Par., Silver Hill Gap, 10-V-1970, under stones by stream, J. H. Frank (6:JHFC), 14-VI-1970, under stone by stream, J. H. Frank (1:JHFC), 19-X-1970, under stones by stream, J. H. Frank and M. Alam (5:JHFC), 31-I-1971, under stones by stream, J. H. Frank (4:JHFC), Hardwar Gap, 9-IX-1971, under stones by stream, about 1,060 m, J. H. Frank (5:JHFC), 8-III-1972, in gravel of stream bank, J. H. Frank (1:JHFC), near Spring Hill, 19-X-1970, in donkey dung by river, J. H. Frank and M. Alam (2:JHFC); M. Cameron (holotype ♀ of *nigrocoeruleus*: BMNH); CUBA: Pinar del Rio, Cayajabos, II-1932, A. Bierig (1:FMNH), El Rangel, 29-XII-1933, A. Bierig (1:FMNH), 4-XII-1938 (2:FMNH), Aspiro, 1-I-1934, A. Bierig (1♂:FMNH; 1♂:USNM), 2-I-1934, A. Bierig (1 ♀:BMNH), Rio Taco-Taco, 20-II-1938, A. Bierig (1:FMNH); HAITI: L'Artibonite, Ennery, 6-11-IX-1934, near 300 m, P. J. Darlington (8:MCZ); M. Cameron (1 ♀:BMNH); DOMINICAN REPUBLIC: Puerto Plata, 25 km by road S. of Puerto Plata, VI-1938, P. J. Darlington (1:MCZ).

REMARKS: Individuals are very distinct among those of other West Indian species because of their large size and lustrous black color. They appear to inhabit higher elevations in the mountains of Jamaica, Cuba, and Hispaniola, but are not known from Puerto Rico. The aedeagus is very distinct (Fig. 30). The closest relative may be the South American *brasilianus*. I am unable to distinguish between examples from the 3 islands, and so I believe that *carbonarius* Brg. is a synonym of *nigrocoeruleus* Cam. It has already been pointed out by Blackwelder (1943) that, although the type locality of *nigrocoeruleus* was stated by Cameron (1922) to be Haiti, the specimen from Cameron's collection (in BMNH) bearing the type label is from Jamaica; so that the type locality should be considered to be Jamaica, and probably somewhere in the Blue Mountains in Surrey County. According to Bierig (1933), the holotype of *carbonarius* was collected on 14-II-1930; no specimen bearing a collection date earlier than 1932 is present in Bierig's collection (in FMNH), and no specimen bears a type label; therefore I do not know the present location of the holotype. I believe that the examples I have seen from Bierig's collection are of *carbonarius* Bierig and that *carbonarius* is a synonym of *nigrocoeruleus*. It may be that the synonymy was recognized by Bierig after the publication of his paper (1933), because the single example in USNM bears a label, apparently in Bierig's handwriting: *Neobisnius* (*carbonarius*) *Nigrocoerul.* ? Cam. Both *nigrocoeruleus* and *carbonarius* were placed incorrectly as synonyms of *humilis* by Blackwelder (1943, 1944).

N. jocosus group

DIAGNOSIS: Head of ♂ without frontal fovea; paramere of aedeagus asymmetrical (fig. 31, 32), 1 furca much reduced, but both with peg setae at apices; individuals large, 5.0 mm or more in length; anterior transverse depressions of terga III-VI with tuberculate punctures.

17. *Neobisnius jocosus* (Horn)

(fig. 10, 31, map 15)

Actobius jocosus Horn, 1884:232 (type locality: U.S.A., Delaware).
Neobisnius jocosus (Horn); Bernhauer and Schubert, 1914:323; Leng, 1920:106.
Actobius alternans Sharp, 1885:461 (type locality: Guatemala, Escuintla, Paso Antonio).
Neobisnius alternans (Sharp); Bernhauer and Schubert, 1914:322; Bierig, 1933:56.
Erichsonius alternans (Sharp); Blackwelder, 1944:131. NEW SYNONYMY.

TYPES: Lectotype ♀, designated here, of *Actobius jocosus* in Horn's collection in MCZ with labels: Del./Lectotype 3119 [red paper]*A. jocosus* Horn/. Lectotype ♂ and paralectotype ♀, designated here, of *Actobius alternans* Sharp, both mounted on same card in Sharp's collection in BMNH with labels: *Actobius alternans* Type D.S. Paso Antonio 400 ft. Champion [on specimen card]/type [with red circle on paper disc]/Paso Antonio, Guatemala, Champion/B.C.A. Col. I. 2. *Actobius alternans* Sharp/Sharp Coll. 1905-313/; 2 more paralectotypes on similar card and with similar labels but without a 'type' label.

DESCRIPTION: Length 5.0-5.5 mm. Head piceous, pronotum flavo-rufous, elytra piceous with narrow, indistinct, pale apical margin; terga II-VI flavo-rufous, VII-VIII piceous; legs flavo-rufous; antennae flavo-rufous with articles IV-XI darkly infuscate; trophi and labrum flavo-rufous; "parti-colored".

Head quadrate, slightly broadened behind eyes, each of which occupies 0.3 of length of side of head; coarsely punctate and with strigulose microsculpture between punctures. Pronotum slightly elongate, slightly narrowed behind; laterally sinuate; with coarse punctation as head; microsculpture strigulose between punctures. Elytra not much broader jointly than pronotum; longer than jointly broad; more finely and densely punctate than pronotum, scutellum scarcely punctate. Abdomen not much narrower than elytra; punctate about as densely as elytra but more finely so; terga III-VI each with anterior transverse depression with tuberculate punctures. Apex of sternum VIII of ♂ very shallowly notched. Articles VIII-X of antenna quadrate. Aedeagus of paramere asymmetrical (fig. 31); 4 peg setae at apex of each furca.

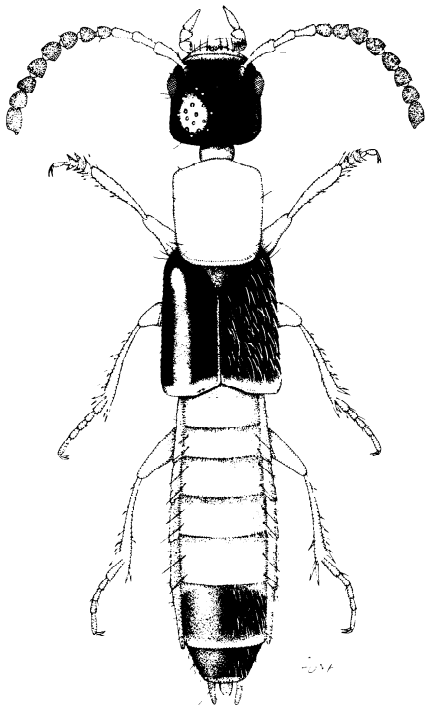
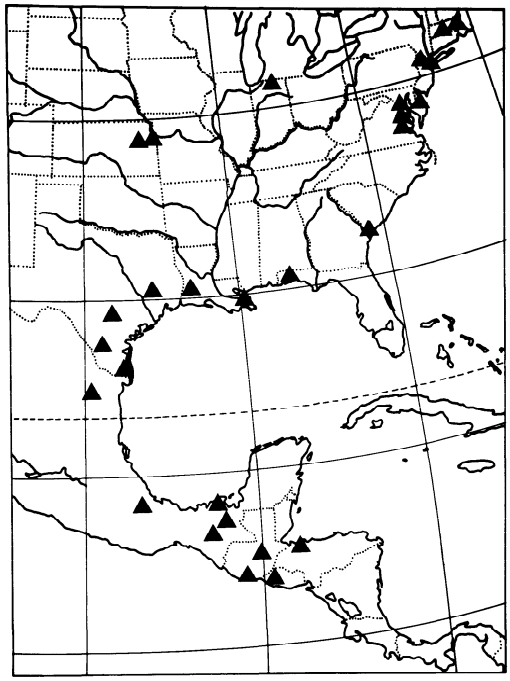


Fig. 10. Habitus of ♂ *N. jocosus* (Horn). Length 5.0-5.5 mm.

DISTRIBUTION (map 15): Northeastern U.S.A. southwards to El Salvador.



Map 15. Distribution of *N. jocosus* in North and Central America

RECORDS: U.S.A.: Massachusetts, Hampden Co., Chicopee, VIII-1907 (1 ♂:USNM); Suffolk Co., West Roxbury, 6-VI-1909, P. G. Bolster (1:MCZ); New York, Richmond Co., Staten Island, Watchogue, 4-V-1913, C. L. Pollard (1:CNC), Staten Island, Great Kills, 7-VI-1938 (1:MCZ); New Jersey, Essex Co., Montclair, 18-V-1929, E. Shoemaker (1 ♀:USNM); Maryland, Montgomery Co., 30-V-1904, E. Shoemaker (1 ♀:USNM); Delaware, (lectotype ♀ of *Actobius jocosus*:MCZ); District of Columbia, 2-VI-1904, E. Shoemaker (1:USNM); Virginia, Spotsylvania Co., Fredericksburg, 19-VI-1904, W. D. Richardson (1 ♀:USNM); S. Carolina, Beaufort Co., Hilton Head Island, 13-VII-1965, H. F. Howden (1 ♂:CNC); Florida, Okaloosa Co., Yellow River at hwy. 90, 21-IV-1977, in vegetation at river edge, J. H. Frank, G. A. Curtis and G. B. Marshall (1 ♂:JHFC); Indiana, Elkhart Co., Elkhart (1 ♂:MCZ); Kansas, Douglas Co., Lawrence, 7-VIII-1933, R. E. Blackwelder (1 ♀:AMNH); Leavenworth Co., Tonganoxie, 27-VII-1933, R. E. Blackwelder (1 ♀:AMNH); Louisiana, Orleans Par., Harahan, 31-VII-1944, F. G. Werner (1:MCZ), 25-VII-1946, F. G. Werner (1 ♂:MCZ); Rapides Par., Magnolia Recreation Area, 15 mi. S.W. of Alexandria, 4-X-1973, pine-hardwood, stream edge, A. F. Newton (1♂:AFNC); Leavenworth Co., Tonganoxie, 27-VII-1933, R. E. Blackwelder (1 ♀:AMNH); Louisiana, Orleans Par., Harahan, 31-VII-1944, F. G. Werner (1:MCZ), 25-VII-1946, F. G. Werner (1♂:MCZ); Rapides Par., Magnolia Recreation Area, 15 mi. S.W. of Alexandria, 4-X-1973, pine-hardwood, stream edge, A. F. Newton (1♂:AFNC); Texas, Brazos Co., Cedar Creek, 14-VII-1970, u.v. light trap, R. Phelps (1 ♀:TAMU); Cameron Co., Brownsville, H. F. Wickham (1♂:USNM), 11-16-VI-1933, P. J. Darlington (4:MCZ), 27-IX-1942, E. S. Ross (1:CNC); Comal Co., New Braunfels, 13-VI-1927, P. J. Darlington (1:MCZ); La Salle Co., Cotulla, 12-V-1906, F. C. Pratt (1 ♂:USNM); MEXICO: Nuevo León, 5 mi. S. of Monterrey, 28-VII-1963, H. F. Howden (1 ♂:CNC); Veracruz, Fortin de las Flores, Sumidero, Planta de la Cerveceria, Ing. Daniel Rábago Res., 22-23-V-1965, 760-915 m, u.v. light trap, H. V. Weems, Jr. (1 ♂:FSCA), Fortín de las Flores, 5-VII-1967, R. H. Crandall (1 ♂:IM); Tabasco, Frontera, 23-VI-1969, D. E. Bright and J. M. Campbell (1:CNC); Chiapas, Tinijapa, 8 mi. N.E. of San Cristóbal, 26-V-1969, J. M. Campbell (1:CNC), Palenque, 7-V-1969, D. E. Bright and J. M. Campbell (3:CNC); GUATEMALA: Escuintla, Paso Antonio, 120 m, H. G. Champion (lectotype ♂, 3 paralectotypes of *Actobius alternans*:BMNH), Torola, 305 m, H. G. Champion (1:BMNH); Baja Verapaz, San Jerónimo, H. G. Champion (1:BMNH); EL SALVADOR: La Paz, 20 km. E. of La Libertad, 8-V-1971, H. F. Howden (2:CNC); HONDURAS, Atlántida, Lancetilla, VIII, Stadelman (1 ♂:MCZ).

REMARKS: Horn (1884) gave the distribution of his new species, *Actobius jocosus*, as Delaware and North Carolina. The lectotype selected is from Horn's collection and is from Delaware. Sharp (1885) did not designate a holotype for his species *Actobius alternans*, so 1 of the syntypes is designated here. I find no difference between these lectotypes nor between them and other material mentioned above, so I reduce the name *Actobius alternans* Sharp to synonymy. The collecting of additional material from central Mexico may well show the distribution to be continuous from the eastern United States to El Salvador. Adults of *jocosus* are distinguished easily from those of all North American species except *paederoides*. The structure of the aedeagus separates ♂ specimens readily (*jocosus* fig. 31, *paederoides* fig. 25), though use of external structure (*jocosus* individuals are larger, with punctures of head and pronotum closer and coarser; head less transverse; eyes relatively smaller; pale apical margin of elytra indistinct; microsculpture of head and pronotum more distinct) calls for value judgment.

18. *Neobisnius armuellensis* Bierig

(fig. 32, map 16)

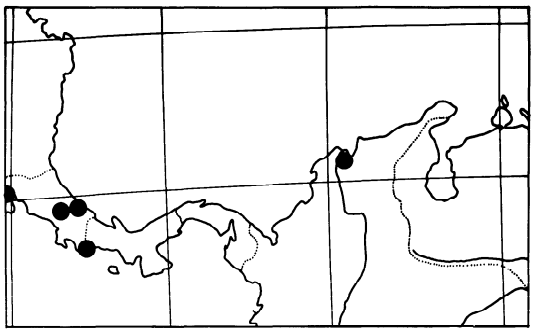
Neobisnius armuellensis Bierig, 1933:56 (type locality: Panama, Chiriquí, Puerto Armuelles).
Erichsonius armuellensis (Bierig); Blackwelder, 1944:131.

TYPES: Holotype ♂ in Bierig's collection in FMNH with labels: Pto. Armuelles VII. 30 Panama/TYPUS [green paper]/Field Mus. Nat. Hist. 1966 A. Bierig Colln. Acc. Z. 13812/*N. armuellensis* Brg./; 3 paratypes labelled similarly in the same collection, 2 of them labelled PARATYPUS [blue paper] and one labelled COTYPUS [red paper].

DESCRIPTION: Length 5.0 mm. Head piceous, pronotum flavo-rufous, elytra piceous but slightly rufescent, with narrow, pale, apical margin equal to about 0.08 elytral length; scutellum colored as pronotum; segments II-VI, and VIII colored as pronotum, but VII colored as elytra and with apical margin indistinctly paler; legs flavo-rufous with femora paler; antenna flavo-rufous but with apex of article III, and articles IV-XI darkly infuscate; trophi flavo-rufous; "parti-colored".

Head quadrate, scarcely narrowed behind eyes, each of which occupies about 0.37 of length of side of head; rather coarsely but shallowly punctate; with indistinct strigulose microsculpture between punctures. Pronotum longer than broad, not much narrower than head; narrowed posteriorly; with punctures much as head; with indistinct strigulose microsculpture. Elytra longer than jointly broad, not much broader than elytra; densely but rather finely punctate. Abdomen almost linear, not much narrower than elytra; anterior transverse depressions of terga III-VI without much evidence of tuberculate punctures; apical notch of sternum VIII of ♂ small and rounded. Articles VIII-X of antenna slightly transverse. Male aedeagal paramere asymmetrical (fig. 32); 1 furca with 5 peg setae, the other with 6.

DISTRIBUTION (map 16): Costa Rica southwards to Colombia.



Map 16. Distribution of *N. armuellensis* in Colombia and Central America

RECORDS: COSTA RICA: Limón, Hamburgfarm, I-1925, F. Nevermann (1:FMNH), 12-11-1935, on sandbank, F. Nevermann (1 ♀:USNM); San José, La Caja, II-IV-1940, H. Schmidt (1 ♂:FMNH); Guanacaste, El Viejo, 22-VII-1979, in drainage ditch, J. H. Frank (2: JHFC); PANAMA: Chiriquí, Puerto Armuelles, VII-1930, A. Bierig holotype ♂ and paratype ♀:FMNH), 22-VII-1930, A. Bierig (paratype ♀:FMNH; 1:AMNH), 27-VII-1930, A. Bierig (paratype ♀:FMNH); COLOMBIA: Magdalena, Río Frío, P. J. Darlington (3:MCZ).

REMARKS: It is evident that this species is related closely to *jocosus*. The apparent disjunction in the range of these 2 species (neither is recorded from Nicaragua) is worth further investigation to determine whether the specific characters of individuals remain constant. For *armuellensis*, these characters are the form of the aedeagus (each furca with 5 or 6 peg setae cf. 4 in *jocosus*), abdominal segment VIII colored as II-VI (not as VII as in *jocosus*), and eyes larger and more protruding. Individuals of no other species are likely to be confused with those of *armuellensis* in its geographical range, even if identification is based only on color.

N. scutellaris group

DIAGNOSIS: Head of ♂ without frontal fovea; paramere of aedeagus bifurcate symmetrically, furcae not long, each with 5-6 peg setae at apex (fig. 33-35); size small (4.0-4.2 mm); anterior transverse depressions of terga III-VI without coarse tuberculate punctures; head microsculpture not very evident. Known only from South America.

19. *Neobisnius fraternus* Bernhauer

(fig. 33, map 17)

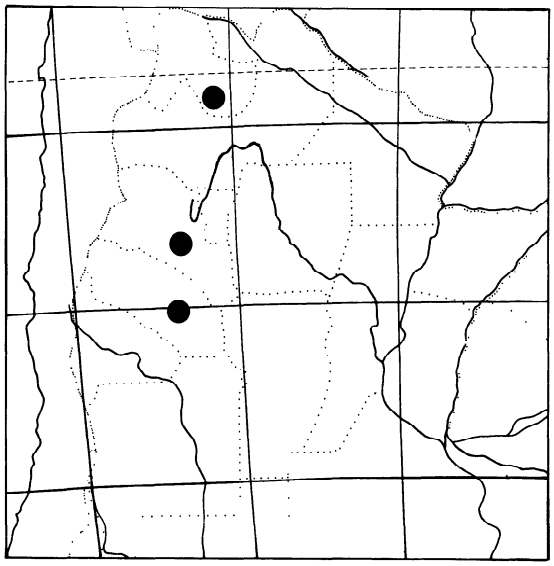
Neobisnius fraternus Bernhauer, 1921:105 (type locality: Argentina, Jujuy); Scheerpeltz, 1933:1327.
Erichsonius fraternus (Bernhauer); Blackwelder, 1944: 131.

TYPES: Holotype ♂ in Bernhauer's collection in FMNH with labels: Rep. Argentina Prov. Jujuy V. 1920 C. Bruch/*fraternus* Bernh. Typus/Chicago NHMus. M. Bernhauer Collection/.

DESCRIPTION: Length 4.0-4.2 mm. Head, pronotum, and scutellum piceous; elytra piceous basally, becoming paler posteriorly, so that hind margin is flavescent; abdominal segments piceous with apical margins slightly paler; legs piceous with tarsi flavescent; trophi castaneous; articles I-III of antenna castaneous with remaining articles piceous.

Head quadrate, not narrowed behind eyes, each of which occupies 0.3 length of side of head; rather densely punctate with indistinct strigulose microsculpture. Pronotum longer than broad, not much narrower than head; slightly sinuate laterally; not much narrowed posteriorly; punctate similarly to head and with indistinct strigulose microsculpture. Elytra anteriorly not much broader than pronotum, broadened posteriorly; longer than jointly broad; more finely and densely punctate than pronotum. Abdomen not much narrower than elytra, almost linear; anterior transverse depressions of terga III-VI without coarse tuberculate punctures; finely and densely punctate; sternum VIII of ♂ with moderately deep apical notch. Articles VIII-X of antenna transverse. Aedeagus (fig. 33) not acute at apex.

DISTRIBUTION (map 17): Western Argentina.



Map 17. Distribution of *N. fraternus* in western Argentina

RECORDS: ARGENTINA: Jujuy, V-1920, C. Bruch (holotype ♂:FMNH); Catamarca, Peñas Azúles, Weiser (2:FMNH), Pampa Grande, Weiser (1 ♀:FMNH); La Rioja, Sarmiento Dep., Ciénega Quebrada, 3,000 m, Weiser (1:FMNH).

REMARKS: The size, color, and lack of frontal fovea of ♂ individuals of this species distinguish them from those of all other South American congeners.

20. *Neobisnius scutellaris* Bernhauer

(fig. 11, 34, map 18)

Neobisnius scutellaris Bernhauer, 1908:336 (type locality: Paraguay); Bernhauer and Schubert, 1914:324; Scheerpeltz, 1933:1327.

Erichsonius scutellaris (Bernhauer); Blackwelder, 1944: 132.

TYPES: Holotype ♀ in Bernhauer's collection in FMNH with labels: Paraguay 1g Drake 1885/*scutellaris* Brh. Typus/Chicago NHMus. M. Bernhauer Collection/.

DESCRIPTION: Length 4.0 mm. Head castaneous, in some individuals picescent posteriorly from vertex; pronotum castaneous to flavo-castaneous; elytra including scutellum castaneous, with flavescent apical margin, and flavescent pale area on disc posterior to and lateral to scutellum; terga II-VI castaneous with flavescent apical margin; tergum VI feebly infuscate; terga VII-VIII piceo-castaneous with anterior margin castaneous and posterior margin flavescent; legs flavo-rufous; trophi flavo-rufous; antenna flavo-rufous with articles III-IX darkly infuscate and articles X-XI rufescent.

Head quadrate to very slightly transverse, not much narrowed behind eyes, each of which occupies 0.45 of length of side of head; punctures moderately large but rather sparse; microsculpture strigulose but scarcely evident. Pronotum scarcely narrower than head; elongate; slightly sinuate laterally; slightly narrowed posteriorly; punctures denser and rather coarser than those of head; microsculpture strigulose but indistinct. Elytra not much broader than pronotum, more finely and closely punctate. Abdomen almost linear; anterior transverse depressions of terga III-VI without coarse tuberculate punctures. Apical notch of sternum VIII of male very shallow. Penultimate article of antenna quadrate to slightly elongate. Aedeagus (fig. 34) blunt at apex.

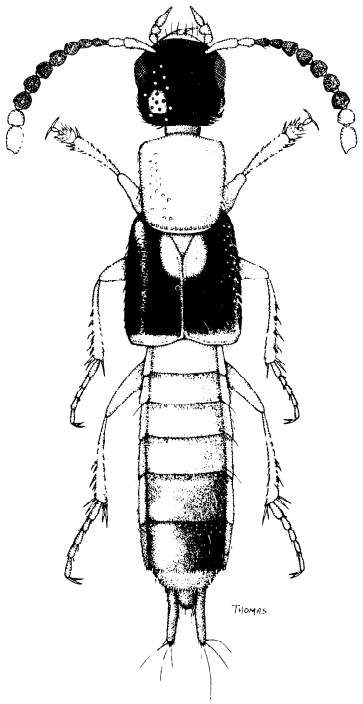
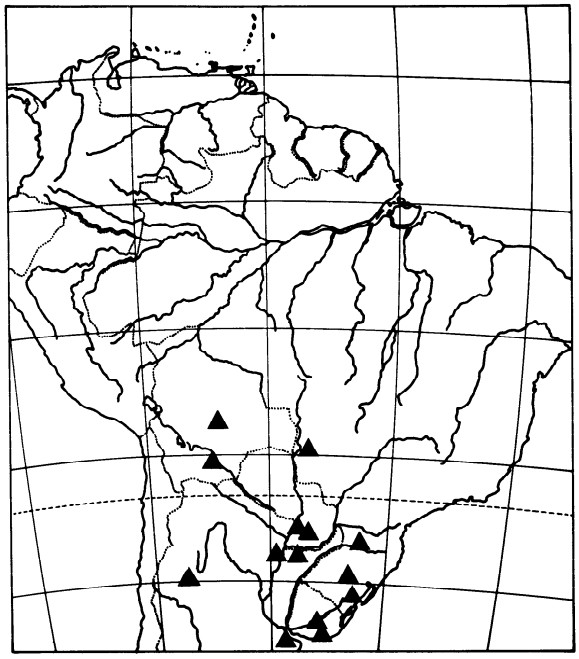


Fig. 11. Habitus of ♂ *N. scutellaris* Bernhauer. Length 4.0 mm.

DISTRIBUTION (map 18): South America.



Map 18. Distribution of *N. scutellaris* in South America

RECORDS: BOLIVIA: Tarija, Pilcomayo River, 15-VI-1920, G. L. Harrington (1 ♀:USNM); Santa Cruz, Saaredra Research Station, 10-IV-1978, u.v. light trap, H. Serrate (17:JHFC); BRAZIL: Mato Grosso Corumbá, B. Haas (2:FMNH: 1:BMNH); Santa Catarina, Nova Teutonia, IV-1948, F. Plaumann (1: MCZ), I-1971, F. Plaumann (18:CNC), III-1972, light trap, F. Plaumann (2:IM), I-1973, light trap, F. Plaumann (1:IM) Río Grande do Sul, Sinimbú, IX-1960, 200 m, F. Plaumann (1:CNC), Pelotas, 29-XI-1952, C. Biezanko (1 ♂:MCZ); PARAGUAY: (holotype ♀: FMNH); Paraguarí, Ybytymi, 10-I-1972, L. Pena (54: CNC); Caazapá, Villa Pastoreo, 1-3-I-1972, L. Pena (36: CNC); ARGENTINA: Corrientes, Loreto Misiones (1: FMNH); Catamarca, Concepción, 5-XII-1971, L. H. Herman (1 ♀:AMNH); Santa Fé, Villa Ana, XII-1925, K. J. Hayward (1 ♀:BMNH); Buenos Aires, Tigre, 1938, M. J. Viana (1:FMNH), V-1939, M. J. Viana (1:FMNH), La Plata, P. Spegazzini (11:MCZ); URUGUAY: San José, Río de las Balsas, 29-X-1933 (1:FMNH); Montevideo, Prado, 20-X-1933 (2:FMNH), Cerro, 22-X-1933 (4:FMNH), Montevideo (1 ♂:BMNH).

REMARKS: This species is not only widespread in South America, but I have seen more South American examples than of any other species. If these facts are

meaningful, they may mean that it is very successful, the counterpart of the North American *occidentoides*, and yet apparently not related closely. Species apparently closely related to it (and perhaps less successful) are *fraternus* and *omnirufus*; individuals of the 3 species can be distinguished by color.

21. *Neobisnius omnirufus* Frank, NEW SPECIES

(fig. 12, 35, map 19)

TYPES: Holotype ♂ in MCZ with labels: Mendoza Argentina/Gift of Thomas Barbour/*Neobisnius omnirufus* ♂J. H. Frank HOLOTYPE/.

DESCRIPTION: Length 4.3 mm. Body entirely rufoferruginous with legs slightly paler and articles V-XI of antennae infuscate.

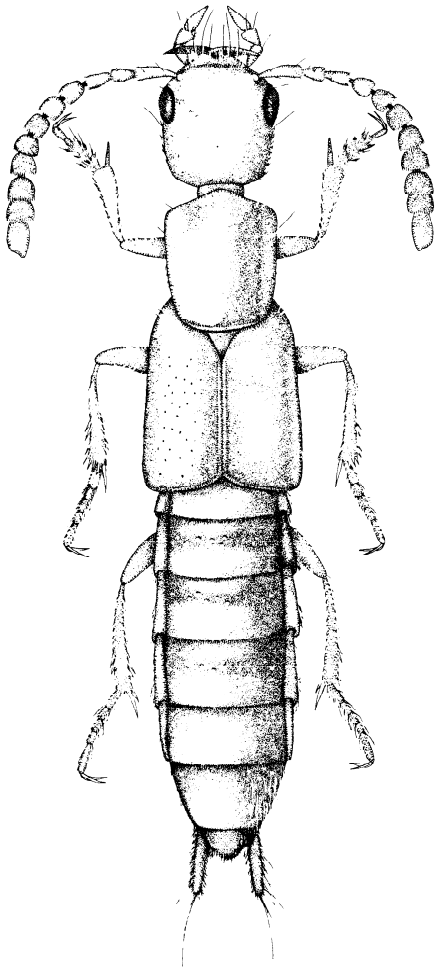
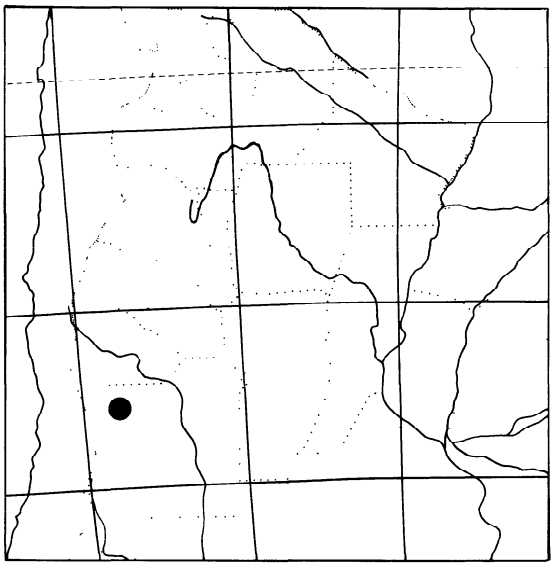


Fig. 12. Habitus of ♂ *N. omnirufus* Frank, Length 4.3 mm.

Head quadrate to slightly elongate, slightly narrowed behind eyes; eye occupying 0.35 length of side of head; moderately coarsely and closely punctate; microsculpture indistinct, but strigulose. Pronotum anteriorly as wide as head behind eyes; elongate; slightly sinuate laterally; narrowed posteriorly; moderately coarsely and closely punctate. Elytra longer than jointly broad; slightly wider anteriorly than pronotum; broader posteriorly; finely punctate. Abdomen slightly widened to segment VI which is about as broad as elytra; transverse depressions of terga III-VI without much evidence of tuberculate punctures. Apical notch of sternum VIII of ♂ rather broad and shallow. Article II of antenna scarcely broader than III; penultimate article quadrate to slightly elongate. Aedeagus (fig. 35) rather pointed at apex.

DISTRIBUTION (map 19): Western Argentina.



Map 19. Distribution of *N. omnirufus* in western Argentina

RECORDS: ARGENTINA: Mendoza (holotype ♂: MCZ).

REMARKS: There is no indication as to whether the type locality is the city of Mendoza, but the holotype must at least have been collected in the province of that name. The name is from Latin *omni* (all) and *rufus* (red) to stress the distinction from *semirufus*.

The species is closely related to *scutellaris*, but adults differ in color, in the more elongate shape of the head, smaller eyes, and different form of aedeagus (fig. 35 cf. 34) which is more pointed than in either *scutellaris* or *fraternus*. The holotype appears to be completely mature, not merely a pale, teneral specimen.

N. demmeli group

DIAGNOSIS: Head of ♂ without frontal fovea; aedeagus with symmetrically bifurcate paramere (fig. 36), each furca with 3 peg setae near apex; microsculpture of head indistinct to absent; anterior transverse fovea of terga III-VI with coarse tuberculate punctures.

22. *Neobisnius demmeli* Bierig

(fig. 13, 36, map 20)

Neobisnius demmeli Bierig, 1933:54 (type locality: Cuba, Pinar del Rio, Sierra del Rosario, Cayajabos).
Erichsonius demmeli (Bierig); Blackwelder, 1943:441, 1944:131 (as synonym of *humilis* (Erichson)).

TYPES: Holotype ♂ in Bierig's collection in FMNH with labels: Cayajabos 15.II.1932 Cuba/Typus [green paper]/Field Mus. Nat. Hist. 1966 A. Bierig Colln. Acc. Z-13812/*N. demmeli* Brg./; I have remounted the holotype on a 3 × 10 mm card; 4 paratypes in the same collection, 1 in USNM.

DESCRIPTION: Length 4.0 mm. Head dark castaneous; pronotum castaneous; elytra piceo-castaneous with apical margin of each segment paler; legs ferruginous; labrum and trophi ferruginous; antennae ferruginous with articles IV-XI infuscate.

Head quadrate, scarcely narrowed behind eyes, each of which occupies 0.3 of length of side; punctures fairly coarse but not dense, shining between and with microsculpture indistinct or absent; head of ♂ without frontal fovea but with a longitudinal depression. Pronotum elongate; narrowed posteriorly; slightly sinuate laterally; anteriorly as broad as head at hind angles; punctate similarly to head. Elytra longer than jointly broad; slightly broader posteriorly; with finer and denser punctation than pronotum. Abdomen not much narrower than elytra; more or less linear; terga III-VI each with anterior depression with rather coarse tuberculate punctures; apical notch of sternum VIII of ♂ deep. Article II of antenna scarcely broader than article III; penultimate article quadrate. All examples seen by me appear rather depressed (flattened), more so than examples of any other species I have seen. Aedeagus (fig. 36) symmetrically bifurcate with only 3 peg setae towards apex of each furca.

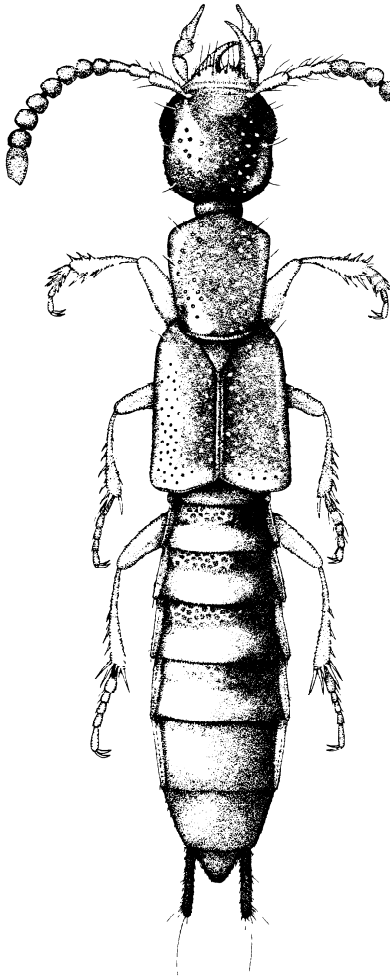
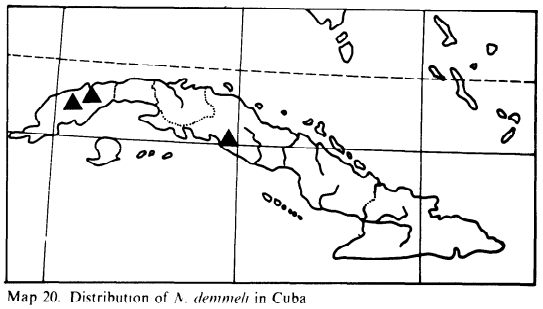


Fig. 13. Habitus of ♂ *N. demmeli* Bierig. Length 4.0 mm.

DISTRIBUTION (map 20): Mountains in Cuba.



Map 20. Distribution of *N. demmeli* in Cuba

RECORDS: CUBA: Pinar del Río, Cayajabos, 14-II-1932, Bierig and Demmel (2 paratypes:FMNH), 15-II-1932, A. Bierig (holotype♂:FMNH), 26-27-III-1932, A. Bierig (2 paratypes:FMNH; 1 paratype [no. 52744]: USNM), Sierra Rangel, 29-XII-1933, A. Bierig (1 ♀: BMNH), 24-VIII-1936, about 460 m, P. J. Darlington (1:MCZ); Cienfuégos, Soledad, IV-1936, P. J. Darlington (1 ♂:MCZ).

REMARKS: In the original description of the species, Bierig (1933) cited only 2 examples collected on 14-II-1932 and 3 on 26-27-III-1932, and stated "Tipos en mi colección". Yet the example bearing the "Typus" label is an example labelled 15-II-1932. I assume that, by some oversight, Bierig failed to mention the date 15-II-1932 or that he had a total of 6 examples, possibly because he had made a 2-day collecting trip on 14-15-II-1932, possibly because he considered the holotype distinct from the paratypes. I consider the example collected on 15-II-1932 and bearing the "Typus" label to be the holotype and the 2 examples collected on 14-II-1932 and 3 examples collected on 26-27-II-1932 to be paratypes.

Blackwelder (1943) placed *demmeli* in synonymy with *humilis* (Erichson), but I remove it from synonymy. Individuals of these 2 species bear only a superficial resemblance to one another, and those of *demmeli* are depressed, and the aedeagus (fig. 36) is distinctive. *N. demmeli* occurs within part of the range of *humilis*. It is not closely related to any species known to me but has characters which seem to be intermediate between other groups of species. It may be a relict species and is confined to mountains in Cuba.

N. semirufus group

DIAGNOSIS: Head of ♂ with frontal fovea; aedeagus with symmetrically bifurcate paramere (fig. 37-40), each furca with only 2 or 3 peg setae near apex; anterior transverse depressions of abdominal terga III-VI with evident tuberculate punctures; from South and Central America.

23. *Neobisnius semirufus* Bernhauer

(fig. 14, 37, map 21)

Neobisnius semirufus Bernhauer, 1921:105 (type locality: Argentina, Salta); Scheerpeltz, 1933:1328.
Erichsonius semirufus (Bernhauer); Blackwelder, 1944: 132.

TYPES: Holotype ♂ in Bernhauer's collection in FMNH with labels: Rep. Argentina Prov. Salta 190 C. Bruch/ *semirufus* Bernh. Typus unic. [yellow paper]/Chicago NHMus. M. Bernhauer Collection/.

DESCRIPTION: Length. 4.0 mm. Head and pronotum flavo-rufous; elytra piceo-castaneous with flavescent apical margin; terga piceo-castaneous with base slightly paler and apical margin flavescent. Legs and trophi flavo-rufous; antenna flavo-rufous with articles III-XI infuscate.

Head slightly elongate, narrowed behind eyes each occupying 0.35 of length of side; rather sparsely punctate; without any obvious microsculpture. Pronotum elongate; slightly sinuate laterally; anteriorly as broad as head behind eyes; sparsely punctate; without any obvious microsculpture. Elytra not much broader than pronotum; longer than jointly broad; very slightly broader posteriorly; punctate not much more finely and densely than pronotum. Abdomen almost linear; not much narrower than elytra; more closely punctate than elytra; anterior transverse depression of terga III-VI with fairly coarse tuberculate punctures; apical notch of sternum VIII of ♂ shallow. Article II of antenna scarcely broader than III; penultimate article quadrate to slightly transverse. Aedeagus illustrated by fig. 37; each furca with 2 peg setae at apex.

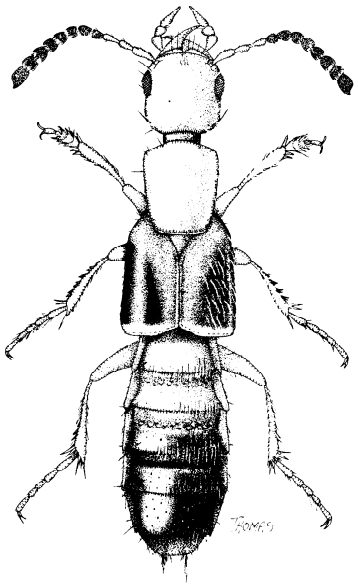
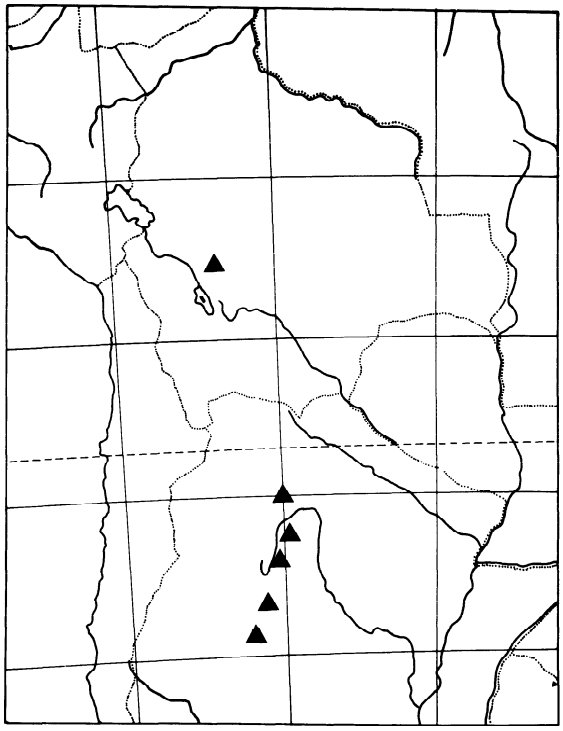


Fig. 14. Habitus of ♂ *N. semirufus* Bernhauer. Length 4.0 mm.

DISTRIBUTION (map 21): Western Argentina to central Bolivia.



Map 21. Distribution of *N. semirufus* in Bolivia and western Argentina

RECORDS: ARGENTINA: Salta, C. Bruch (holotype ♂:FMNH); Tucumán, IV-1906, P. Spegazzini (1:MCZ), 28-IX-1929 (1:AMNH), 14-X-1929, H. E. Box (1: BMNH), Candelaria, VII-1933, Bosq[. . .?](2:FMNH); Catamarca, 27-I-1912, C. Bruch (1 ♂:FMNH), Concepción, 5-XII-1971, L. H. Herman (3:AMNH); BOLIVIA: Cochabamba, 22-III-1940, W. Wittmer (1 ♂:BMNH).

REMARKS: Individuals of this species are readily distinguished from those of the South American near-relative, *richteri*, by the color pattern, denser punctation, broader pronotum, and aedeagus (fig. 37 cf. fig. 40). They are distinguished easily from those of *omnirufus* by the presence of a frontal fovea in the ♂ and by the darker color of the elytra and abdomen. Color alone is sufficient to distinguish them from specimens of *funerulus* and *nitidulus*, neither of which is sympatric.

24. *Neobisnius funerulus* Cameron

(fig. 38, map 22)

Neobisnius funerulus Cameron, 1922:119 (type locality: St. Vincent); Scheerpeltz, 1933:1327;
Erichsonius funerulus (Cameron); Blackwelder, 1943: 441; 1944:131 (as a synonym of *humilis* (Erichson)).

TYPES: Holotype ♀ in BMNH with labels: Type H. T. [in red circle on paper disc]/W. Indies 1920-353/St. Vincent, W. I. H. H. Smith 26/*Neobisnius funerulus* Cam./*Actobius funerulus* Fvl./.

DESCRIPTION: Length 4.2 mm. Head, elytra and abdomen dark castaneous to piceous; pronotum castaneous; elytra with narrow and indefinite pale apical margin; apical margins of abdominal segments somewhat rufous; legs entirely flavous; trophi ferruginous; articles I-II and base of III of antenna ferruginous, remaining articles darkly infuscate except for last article which is somewhat paler.

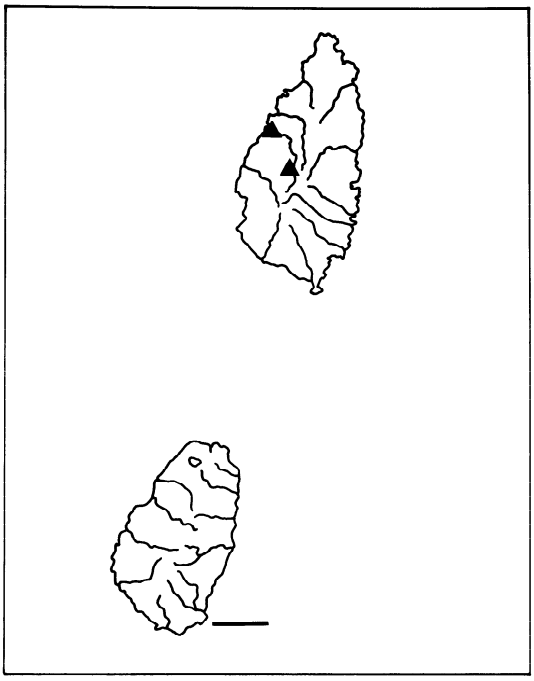
Head quadrate; eyes large, each occupying 0.45 of length of side, but not especially prominent; head not much narrowed behind eyes; ♂ with distinct small, circular frontal fovea, ♀ without fovea or depression; punctures of head large and close, with indistinct strigulose microsculpture between them. Pronotum at anterior angles slightly narrower than head, narrowed posteriorly and with sides rather sinuate; closely and coarsely punctate, as head. Elytra broader than pronotum, longer than jointly broad; broader posteriorly; with finely and moderately close punctures. Abdomen narrower than elytra, becoming broader towards segments V-VI; apical notch of sternum VIII of ♂ shallow. Antenna article II scarcely broader than III; penultimate article not at all transverse. Aedeagus illustrated by fig. 38, each furca with 3 peg setae at apex.

DISTRIBUTION (map 22): St. Lucia and St. Vincent (southern Lesser Antilles).

RECORDS: ST. LUCIA: Anse-la Raye, Roseau River, 29-III-1936, under stones and sand along stream, R. E. Blackwelder (1♂;USNM), Millet River, 3-IV-1936, under stones and sand along stream, R. E. Blackwelder (1 ♂;USNM); ST. VINCENT: H. H. Smith (holotype ♀;BMNH).

REMARKS: The precise type locality within St. Vincent was not stated by Cameron (1922). Blackwelder (1943) placed *funerulus* in synonymy with *humilis* (Erichson), but individuals of these species bear no more than a slight resemblance and are not sympatric; I remove it from synonymy here. *N. funerulus* occurs within the range of *ludicrus*, but individuals of *funerulus* are dark, while those of *ludicrus* from the southern Lesser Antilles are paler, almost "parti-colored". The aedeagus (fig. 38) differs markedly in structure from that of *humilis* (fig. 26), and of *ludicrus* (fig. 27).

N. funerulus is not sympatric with any of the 3 other known members of its species group.



Map 22. Distribution of *N. funerulus* in St. Lucia and St. Vincent

25. *Neobisnius nitidulus* (Sharp)

(fig. 39, map 23)

Actobius nitidulus Sharp, 1885:460 (type locality: Guatemala, Department of Guatemala, near Guatemala City).
Neobisnius nitidulus (Sharp); Bernhauer and Schubert, 1914:323.
Erichsonius nitidulus (Sharp); Blackwelder, 1944:131.
Actobius politus Sharp, 1885:461 (type locality: Mexico, state and locality unspecified, but doubtless in southern Mexico); Sharp 1887:790.
Neobisnius politus (Sharp); Bernhauer and Schubert, 1914:323.
Erichsonius politus (Sharp); Blackwelder, 1944:132. NEW SYNONYMY.

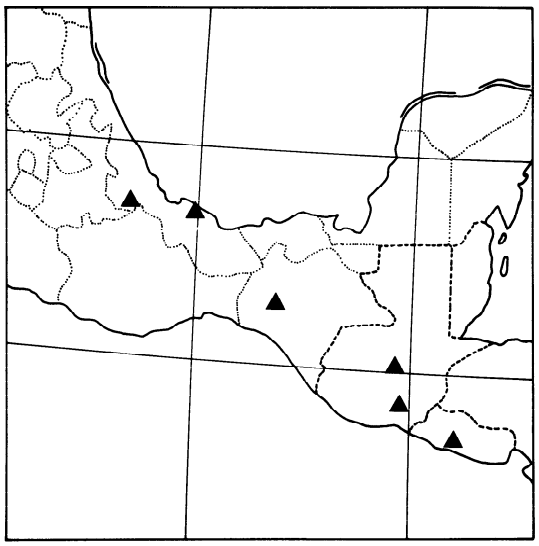
TYPES: Two syntypes of *Actobius nitidulus*, both mounted on the same specimen card in Sharp's collection to BMNH with labels: *Actobius nitidulus* Types D. S. Guatemala City Champion [written on specimen card]/Type [in red circle on disc]/Guatemala City, Champion/B. C. A. Col. 1.2. *Actobius nitidulus* Sharp/; I designate the example on the left as lectotype; 2 paratypes in same collection with similar labels, both mounted on 1 specimen card, without any "Type" labels. Holotype ♀ of *Actobius politus* in Sharp's collection in BMNH with labels: *Actobius politus* Type D. S. Mexico Flohr [written on specimen card]/Type [in red circle on

disc]/Mexico, Flohr/ B. C. A. Col. 1.2. *Actobius politus*, Sharp/Sharp Coll. 1905-313/.

DESCRIPTION: Length 4.2 mm. Head pale castaneous to piceo-castaneous; pronotum flavo-castaneous to dark castaneous; elytra dark castaneous to piceous with apical margin paler; abdomen colored as pronotum but with disc of each tergum and especially terga V-VI infuscate (the terga in the darkest examples have only a pale apical border); legs, trophi and antennae flavous to flavo-rufous, but with articles III-XI of antenna infuscate.

Head quadrate, slightly narrowed behind eyes; eye occupying about 0.4 of length of side; very sparsely punctate and without any obvious microsculpture. Pronotum anteriorly as broad as head behind eyes; narrowed posteriorly; slightly sinuate laterally; very sparsely punctate. Elytra jointly broader than pronotum; jointly as broad as long; slightly broader posteriorly; sparsely punctate. Abdomen narrower than elytra; slightly broader posteriorly toward segments V-VI; each tergum with anterior transverse depression with tuberculate punctures; apical notch of sternum VIII of ♂ shallow. Article II of antenna scarcely broader than III; penultimate article slightly transverse. Aedeagus illustrated by fig. 39, each furca with 2 peg setae at apex.

DISTRIBUTION (map 23): Southern Mexico southwards to El Salvador.



Map 23. Distribution of *N. nitidulus* in southern Mexico and Central America

RECORDS: MEXICO: Veracruz, Dos Amates, 3-4-V-1969, J. M. Campbell and D. E. Bright (1 ♂:CNC), Montepio, 8 mi. N. of Sontecomapan, 20-VI-1969, J. M. Campbell (1 ♀:CNC), Córdoba, A. Fenyes (2♂♂, 1 ♀:CAS); Chiápas, junction of routes 190 and 195, 6-VI-1969, J. M. Campbell (1♂:CNC); GUATEMALA: Baja Verapaz, San Jerónimo, H. G. Champion (6:BMNH), Guatemala City, H. G. Champion, (lectotype and 3 paratypes of *Actobius nitidulus*:BMNH); EL SALVADOR: La Libertad, Santa Tecla, Los Chorros, 5-7-V-1971, in human dung, S. Peck (1♂:CNC).

REMARKS: Mexican examples are palest, and the example from El Salvador is the darkest in color. I have seen an inadequate number of examples to determine whether the color variation is continuous from North to South. I am convinced that both pale and dark forms belong to the same species, *nitidulus* (Sharp), and that the pale example seen by Sharp and described as *Actobius politus* is merely a pale example of *nitidulus*. Although Sharp (1885) stated that the pale form (*politus*) is smaller, I have not found this to be so.

Specimens are particularly sparsely punctate, and the elytra are shorter and broader than in other species; these characters make specimens of this species easy to identify.

26. *Neobisnius richteri* Bernhauer

(fig. 40, map 24)

Neobisnius richteri Bernhauer, 1927:245 (type locality: Argentina, Buenos Aires (province)); Scheerpeltz, 1933:1327.

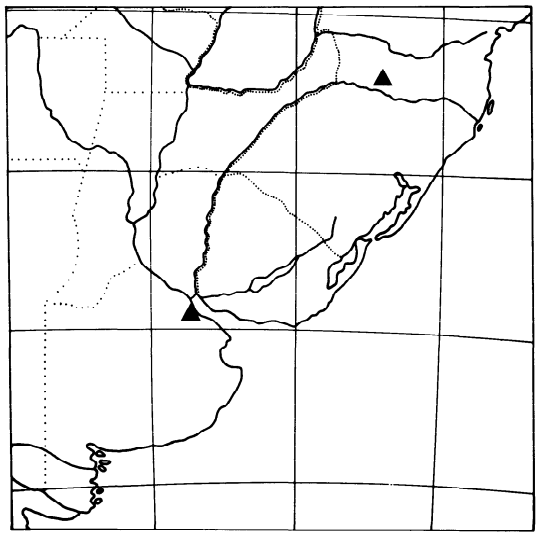
Erichsonius richteri (Bernhauer); Blackwelder, 1944:132.

TYPES: Holotype ♀ in Bernhauer's collection in FMNH with labels: REP. ARGENTINA PROV. BUENOS AIRES H. RICHTER 19 [in black border]/416/3/ *richteri* Brnh. Typus un. don. Richter [on yellow paper]/Chicago NHMus. M. Bernhauer Collection/.

DESCRIPTION: Length 4.5 mm. Head and pronotum unicolorous rufo-castaneous to dark castaneous, but with labrum flavescent; elytra (including scutellum) basally rufo-castaneous but with outer, apical half picescent and narrow apical margin flavescent; abdomen rufo-castaneous but with discs of terga VII-VIII slightly infuscate and with apical margin of each segment flavescent; legs flavous; trophi flavous to slightly infuscate; antenna with article I flavo-rufous, II-III basally flavo-rufous but apicallv infuscate and remaining articles infuscate.

Head quadrate to slightly elongate; slightly narrowed behind eyes, each occupying 0.4 of length of side; sparsely punctate. Pronotum anteriorly as broad as head behind eyes; elongate; slightly sinuate laterally; narrowed posteriorly; sparsely punctate. Elytra broader than pronotum; longer than jointly broad; broader posteriorly, sparsely punctate. Abdomen basally narrower than pronotum; broader towards segments V-VI; sparsely punctate; anterior transverse depressions of terga III-VI with coarse tuberculate punctures; with some evidence of strigulose microsculpture; apical notch of sternum VIII of ♂ shallow. Article II of antenna scarcely broader than III; penultimate article quadrate to very slightly transverse. Aedeagus as in fig. 40, the apex of each paramere with 3 peg setae.

DISTRIBUTION (map 24): Southeastern Brazil to eastern Argentina.



Map 24. Distribution of *N. richteri* in eastern South America

RECORDS: ARGENTINA: Buenos Aires, 19-XI-[? 1904], C. Bruch (1 ♂:FMNH), H. Richter (holotype ♀:FMNH), 21-IX-1920, C. Bruch (1:FMNH); BRAZIL: Santa Catarina, Nova Teutonia, F. Plaumann (10: FMNH), 15-XI-1938, F. Plaumann (1 ♀:BMNH), IV-1948, F. Plaumann (1:MCZ).

REMARKS: The example collected by C. Bruch on 19-XI-[? 1904] was mentioned by Bernhauer (1927) following the original description of the species, as being identical. Thus, I assume that the description is based only on holotype ♀ collected by Richter and that the ♂ collected by Bruch is not a paratype.

Adults are distinguished easily from those of other South American species of similar color by the sparse punctation, presence of a frontal fovea in the ♂ and elytral width, which is markedly broader than the pronotum, much as in *parcepunctatus*.

N. occidentoides group

DIAGNOSIS: Male head with frontal fovea; ♂ aedeagal paramere of most species symmetrically bifurcate (with 4 or more peg setae at apex of each furca (fig. 3, 41-47, 50-51), but in 1 species (fig. 52) with only 2 peg setae, and in 2 species (fig. 48-49) with paramere fused to median lobe, not bifurcate), anterior transverse depressions of terga III-VI with evident tuberculate punctures; mainly from North and Central America, unknown from West Indies.

27. *Neobisnius fortis* (Sharp)

(fig. 41, map 25)

Actobius fortis Sharp, 1885:457 (type locality: Panama, Chiriquí, Volcan de Chiriquí, 1,220-1,830 m).

Neobisnius fortis (Sharp); Bernhauer, 1910:383; Bernhauer and Schubert 1914:323; Lüderwaldt, 1917:46; Scheerpeltz, 1933:1327.

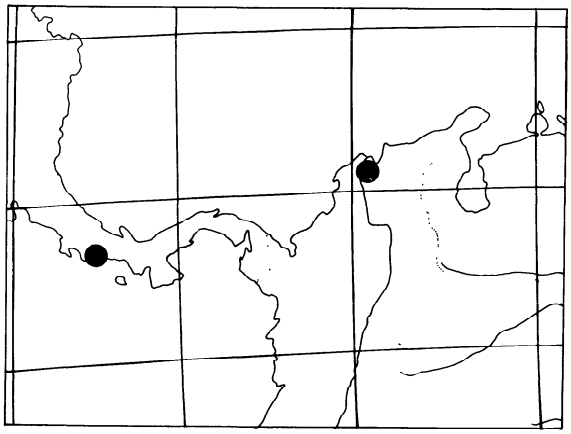
Erichsonius fortis (Sharp); Blackwelder, 1944:131.

TYPES: Holotype ♂ in Sharp's collection in BMNH with labels: *Actobius fortis* Type D. S. V. de Chiriquí 4-6000 ft. Champion [written on specimen card]/ Type [in red circle on disc]/ V. de Chiriquí 4,000-6,000 ft. Champion/ B.C.A. Col. 1.2. *Actobius fortis*, Sharp/ Sharp Coll. 1905-313/.

DESCRIPTION: Length 6.5 mm. Head and elytra nigro-piceous; pronotum and abdomen piceous; legs piceous with basal half of femur slightly paler; trophi dark ferruginous; antenna piceous with articles I-II slightly more rufescent.

Head quadrate to slightly transverse with large and prominent eyes, each occupying 0.4 of length of side; punctures close, not especially coarse relative to size of insect. Pronotum anteriorly as wide as head behind eyes; sinuate laterally; but not narrower posteriorly; more coarsely punctate than head; with a faint trace of microsculpture between punctures. Elytra longer than jointly broad, not much broader posteriorly; sparsely punctate with moderate punctures. Abdomen not much narrower than elytra, not much narrower posteriorly; terga III-VI with anterior transverse depressions with tuberculate punctures, but these not especially prominent; apical notch of sternum VIII of ♂ small and shallow. Hind tibia 0.2 longer than hind tarsus. Article II of antenna scarcely broader than III; penultimate article slightly elongate. Aedeagus (fig. 41) large, apex of each furca with about 8 peg setae.

DISTRIBUTION (map 25): Panama southwards to Colombia.



Map 25. Distribution of *N. fortis* in Panama and Colombia

RECORDS: PANAMA: Chiriquí, Volcan de Chiriquí, 1,220-1,830 m H. G. Champion (holotype ♂:BMNH); COLOMBIA: Magdalena, Río Frío, P. J. Darlington (1 ♀:MCZ).

REMARKS: This species is very closely related to *facilis*, but the adult hind tibia is 0.2 longer than the hind tarsus (cf. of equal length in *facilis*). The ♀ example from Colombia has the bases of the femora more flaves-

cent than in the holotype. The original description by Sharp (1885) gave the length as 7.5 mm, but the type is only 6.5 mm long. *N. maximus*, also closely related, is separated by the rufous abdomen of its adults, while adults of *concolor* are smaller (5.0-5.7 mm), and many of them have a massive head. I have not seen the example collected under a stone at Alto da Serra, in eastern Brazil, by Lüderwaldt (1917:46), and identified as belonging to *fortis* by Bernhauer; if it was identified correctly, the record represents a large extension to the known range.

28. *Neobisnius facilis* (Sharp)

(fig. 42, map 26)

Actobius facilis Sharp, 1885:458 (type locality; Guatemala, Baja Verapaz, San Jerónimo).
Neobisnius facilis (Sharp); Bernhauer and Schubert, 1914:323.
Erichsonius facilis (Sharp); Blackwelder 1944:131.

TYPES: Holotype♂ in Sharp's collection in BMNH with labels: *Actobius facilis* Type D. S. San Geronimo Champion [written on specimen card]/Type [in red circle on disc]/San Geronimo, Vera Paz Champion/B. C. A. Col. 1.2. *Actobius facilis*, Sharp/Sharp Coll. 1905-313/.

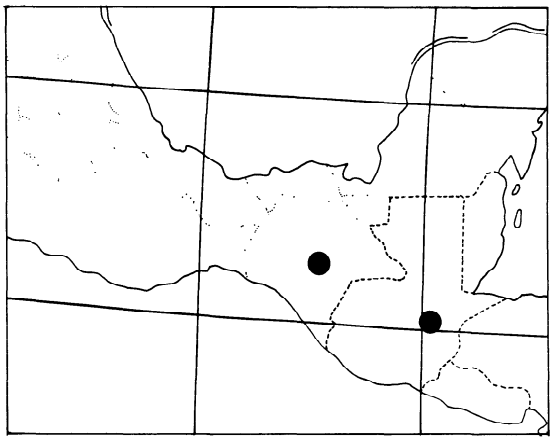
DESCRIPTION: Length 6.5 mm. Head and pronotum piceo-castaneous; elytra piceo-castaneous, slightly rufescent towards apical margin; abdomen slightly more rufous than rest of body; antenna trophi, tibiae, and tarsi colored as abdomen; femora flavous with apex narrowly (about apical 8th) colored as tibiae.

Head quadrate, narrowed behind the eyes, each of which occupies 0.4 of length of side; eyes prominent; punctures fairly close but not particularly coarse relative to size of insect; without distinct microsculpture. Pronotum longer than broad, anteriorly as broad as head behind eyes; sinuate laterally; not narrower posteriorly; impunctate median line narrow; punctures fairly close, not particularly coarse. Elytra not much broader than pronotum; jointly broader than long; slightly broader posteriorly; scarcely more densely punctate then head and pronotum, but punctures shallower. Abdomen not much narrower than elytra; almost linear; anterior transverse depressions of terga III-VI each with tuberculate punctures; sternum VIII of♂ with broad, shallow apical notch. Hind tarsus equal in length to hind tibia. Article II of antenna scarcely broader than III; penultimate article quadrate to slightly elongate. Aedeagus (fig. 42) large, apex of each furca with about 8 peg setae.

DISTRIBUTION (map 26): Southern Mexico and northern Guatemala.

RECORDS: GUATEMALA: Baja Verapaz, San Jerónimo, H. G. Champion (holotype♂:BMNH); MEXICO: Chiapas, junction of routes 190 and 195, 11-VI-1969, J. M. Campbell (1 ♀:CNC).

REMARKS: Examples of this species are similar to those of *fortis*, but the 2 species are not known to be sympatric; for distinguishing characters see remarks under *fortis*. *N. maximus* also is closely related but may be distinguished by the more rufous abdomen. The aedeagus (fig. 42) is produced more broadly to the apex, without constriction, than in the close relatives (fig. 41, 43-47).



Map 26. Distribution of *N. facilis* in Guatemala and southern Mexico

29. *Neobisnius maximus* Bernhauer

(Fig. 43, map 27)

Neobisnius maximus Bernhauer, 1910:383 (type locality: Mexico, Veracruz, Cordoba); Bernhauer and Schubert, 1914:323.
Erichsonius maximus (Bernhauer); Blackwelder, 1944: 131.

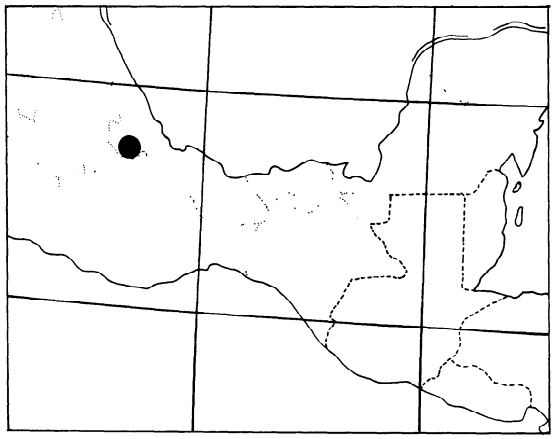
TYPES: Paratype♂ in Bernhauer's collection in FMNH labeled: Córdoba Mex. Ver. Dr. A. Fenyes/[6-pointed star of green paper]/ *maximus* Brh. Cotypus [on yellow paper]/Chicago NHMus. M. Bernhauer Collection/.

DESCRIPTION: Length 5.7 mm. Head, pronotum, and elytra piceo-castaneous, but elytra indefinitely paler at suture and apical margin; abdomen rufo-ferruginous terga VII-VIII slightly infuscate; legs flavous except that fore- and middle tarsi are slightly infuscate; antenna with article I and base of article II ferruginous, remaining articles piceo-castaneous; trophi castaneous.

Head quadrate, rounded behind prominent eyes each of which occupies 0.45 of length of side; punctures moderate in size, not very dense, shining between with scarcely evident microsculpture. Pronotum as broad as head behind eyes; sides almost parallel; rather more coarsely and closely punctate than head; shining between punctures and with scarcely evident microsculpture. Elytra longer than jointly broad; slightly broader than pronotum; more finely and rather more densely punctate than pronotum. Abdomen broader than pronotum, narrower than elytra; almost linear; anterior transverse depressions of terga III-VI with tuberculate punctures; sternum VIII of♂ with shallow apical notch. Article II of

antenna scarcely broader than III; penultimate article quadrate to slightly transverse. Aedeagus (fig. 43) similar to that of *fortis*; each furca with about 7 peg setae at apex.

DISTRIBUTION (map 27): Veracruz (Mexico).



Map 27. Distribution of *N. maximus* in southern Mexico

RECORDS: MEXICO: Veracruz, Córdoba, A. Fenyes (paratype ♂:FMNH).

REMARKS: The "cotype" mentioned above is the only example of the species I have seen. The present location of the "typus" or holotype is unknown to me- it is not in FMNH. Bernhauer (1910) made no mention of the number of examples before him at the time of the original description.

The species is closely related to *facilis* and to *fortis* but the more rufous color of the adult abdomen distinguishes it. Because *maximus* is known from Veracruz and *facilis* from Chiapas, it would not be surprising if the ranges of the 2 species overlap. When more examples of these 2 species become available, their relationships should be re-examined, and also their relationships with *fortis*.

30. *Neobisnius concolor* (Sharp)

(fig. 44, map 28)

Actobius concolor Sharp, 1885:458 (type locality: Panama, Chiriquí, Volcan de Chiriquí, 1,220-1,830 m).

Neobisnius concolor (Sharp); Bernhauer and Schubert, 1914:322; Cameron 1922:119.

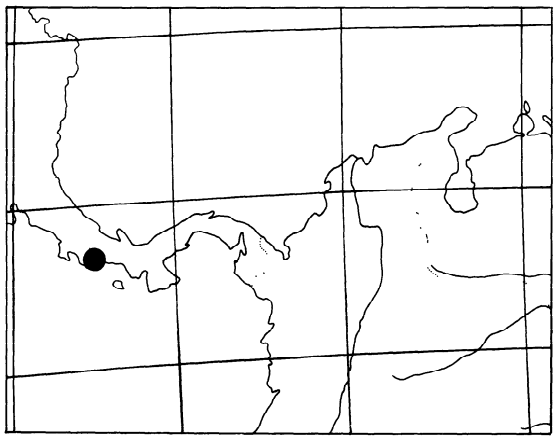
Erichsonius concolor (Sharp); Blackwelder, 1944:131.

TYPES: Holotype ♂ in Sharp's collection in BMNH with labels: *Actobius concolor* type D. S. V. de Chiriquí 4-6000 ft. Champion [written on specimen card]/Type [in red circle on disc]/V. de Chiriqui 4,000-6,000 ft. Champion/B. C. A. Col. 1.2. *Actobius concolor*, Sharp/Sharp Coll. 1905-313/.

DESCRIPTION: Length 5.0-5.7 mm. Head, pronotum and abdomen piceous; apex of each abdominal tergum slightly rufescent; apical margin of elytra very narrowly and indefinitely rufescent; tibiae piceous; femora and tarsi ferruginous; trophi ferruginous; articles I-II of antenna castaneous, remaining articles piceous.

Head quadrate, scarcely narrowed behind the eyes in all ♂♂ seen, but narrowed slightly in some ♀♀; eye occupying 0.35 of length of side of head, not very prominent; punctures of large size, not particularly close in most specimens with distinct strigulose microsculpture between; head of ♀ with elongate groove. Pronotum anteriorly as broad as head or almost so; elongate; narrowed posteriorly; punctures rather coarser than those of head, generally with distinct strigulose microsculpture between. Elytra longer than jointly broad; parallel-sided; finely punctate. Abdomen not much narrower than elytra; broader towards segments VI-VII; terga III-VI with transverse depressions with not very large tuberculate punctures; apical notch of sternum VIII of ♀ shallow. Antennae and legs moderately elongate. Antennal article II scarcely broader than III; penultimate article slightly transverse. Aedeagus (fig. 44) symmetrically bifurcate, similar to that of *sobrinus* (but slightly larger) apex of each furca with 5 or 6 peg setae.

DISTRIBUTION (map 28): Chiriqui (Panama)



Map 28. Distribution of *N. concolor* in Panama

RECORDS: PANAMA: Chiriquí, Volcán de Chiriquí, 1,220-1,830 m, H. G. Champion (holotype ♂ and 4 paratypes:BMNH), 1,220 m, H. G. Champion (1 ♀:BMNH), Peña Blanca, 910-1,220 m, H. G. Champion (1 ♀:BMNH).

REMARKS: I am uncertain whether *concolor* represents a distinct species. The habitus of the holotype is certainly distinct: the head is massive, the punctures of head and pronotum are large, and the microsculpture is

pronounced. One ♀ example, a topotype, resembles the holotype closely, but the head is less massive. The remaining examples, including topotypes are intermediate between the holotype and variants of *sobrinus* in the form of the head; 1 of the examples, a ♀ topotype, does not exhibit the pronounced microsculpture of the remainder; all examples have coarser punctation than is normal in *sobrinus*, but I have seen material which I have attributed to *sobrinus*, in which the punctation is almost as coarse as in *concolor*. The size of the examples of *concolor* varies, with the more distinctive examples, including the holotype, about 5.7 mm in length, but with others as small as 5.0 mm. The aedeagi of the holotype and of the 1 ♂ paratype differ slightly from each other (that of the holotype is slightly more acuminate at the apex), but both might readily be taken for aedeagi of *sobrinus*.

The question of the identity of *concolor* may demand a field study for clarification. For the present it seems preferable to retain the name as distinct from *sobrinus*. The question is pursued further in remarks under *sobrinus*.

31. *Neobisnius sobrinus* (Erichson)

(fig. 45, 46, map 29)

Philonthus sobrinus Erichson, 1840:512 (type locality: U.S.A., Pennsylvania); Hubbard and Schwarz, 1878:631.
Erichsonius sobrinus (Erichson); Fauvel, 1874:427.
Actobius sobrinus (Erichson); Horn, 1884:228.
Neobisnius sobrinus (Erichson); Bernhauer and Schubert, 1914:324; Leng, 1920:106; Bernhauer, 1921: 105; Bierig, 1933:51; Smetana, 1963:4; 1965:10.
Philonthus agnatus Erichson, 1840:513 (type locality: "valle Araguensis Columbiae", probably Venezuela, Aragua); Solsky, 1868:137.
Erichsonius agnatus (Erichson); Fauvel, 1874:427; Blackwelder, 1944:131.
Actobius agnatus (Erichson); Horn, 1884:229 (misidentification: see *Neobisnius ludicrus*); Sharp 1885:459.
Neobisnius agnatus (Erichson); Bernhauer and Schubert 1914:322; Leng, 1920:106: Bierig, 1933:51; Smetana, 1963:4. NEW SYNONYMY.
Actobius ocreatus Horn, 1884:228 (type locality: U.S.A., southern California); Bernhauer and Schubert, 1914:325; Leng, 1920:106. NEW SYNONYMY.
Actobius arduus Sharp, 1885:458 (type locality: Mexico, Puebla).
Neobisnius arduus (Sharp); Bernhauer and Schubert, 1914:322; Bierig, 1933:52.
Erichsonius arduus (Sharp); Blackwelder, 1943:433; 1944:131. NEW SYNONYMY.
Neobisnius simulator Smetana, 1963: 1 (type locality: Canada, Newfoundland, Humber District, Curling); 1965:11. NEW SYNONYMY.

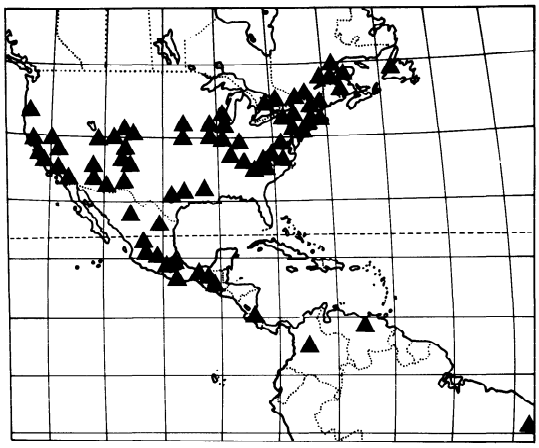
TYPES: I have not seen the lectotype ♂ of *Philonthus sobrinus* designated by Smetana (1963) in Erichson's collection in ISZ, together with 3 paralectotypes. Lectotype ♂ of *Philonthus agnatus* in Erichson's collection in ISZ, designated by Smetana (1963), labelled as described by Smetana (1963) and examined by me together with 3 paralectotypes. Lectotype ♂ designated here of *Actobius ocreatus* in Horn's collection in MCZ with labels: Cal./♂/Lectotype 3108 [red paper]/*A. ocreatus* Horn/; I have remounted the lectotype on a 3 × 10 mm card in place of the original card point. Lectotype ♂ of *Actobius arduus* in BMNH with labels: *Actobius arduus* Types D. S. Puebla, Mexico, Salle [in handwriting on specimen card]/Type [in red circle on paper disc]/Puebla/ Mexico Salle/ B.C.A. Col. 1.2. *Actobius arduus* Sharp/Sharp Coll. 1905-313/; 2 syntypes are mounted on the same specimen card; I designate the example at the left, a ♂, as lectotype; that at the right is labelled "♀"; I have dissected the lectotype. Holotype ♀ of *Neobisnius simulator* in CNC (not Zoological Institute of University of Lund as stated by Smetana (1963)) with label no. 9472, examined by me.

DESCRIPTION: Length 4.7-5.5 mm. Castaneous to piceo-castaneous; pronotum and elytra of most examples slightly paler than head; apical margin of elytra narrowly and in some individuals indistinctly flavescent; abdomen colored similarly to pronotum with apical margin of each segment paler. Legs flavous to slightly flavo-rufous, likewise trophi and articles I-III of antenna, but articles IV-XI dark, castaneous to piceous.

Head quadrate, narrowed behind eyes, each of which occupied 0.35 of length of side; punctures of moderate size, not dense; surface shining between punctures, but with slight trace of strigulose microsculpture. Pronotum anteriorly as broad as head at hind angles; not much elongate; punctate similarly to head; microsculpture scarcely evident; shining between punctures; narrowed posteriorly; slightly sinuate laterally. Elytra not much broader than pronotum; longer than jointly broad; broader posteriorly; finely and sparsely punctate. Abdomen not strikingly narrower than elytra; almost linear; finely and sparsely punctate; terga III-VI each with anterior fovea with quite coarse tuberculate punctures; apical notch of sternum VIII of ♂ moderately deep. Article II of antenna scarcely broader than III; penultimate article slightly elongate. Aedeagus (fig. 45) shows intra-specific variation in degree of elongation of tip of median lobe; apex of each furca with about 6 peg setae.

DISTRIBUTION (map 29): Southeastern Canada; U.S.A. (except Alaska and southern Florida); Mexico southwards to northern South America.

RECORDS: CANADA: Newfoundland, Humber Distr., Curling, 15-VIII-1949, C. H. Lindroth (holotype x of *Neobisnius simulator*:CNC); New Brunswick, York Co., Fredericton, 2-IX-1965, E. F. Legner (2:IM); Quebec, Montreal, 21-VIII-1968, E. J. Kiteley (1:CNC), 2-IX-1973, E. J. Kiteley (2:CNC); Gaspé Ouest Co., La Cascapedia, Parc Gaspesie, 14-VII-1972, 520 m, J. M. and B. A. Campbell (1:CNC); Lotbinière Co., Ste. Croix,



Map 29. Distribution of *N. sobrinus* in North, Central and South America

14-IX-1963, J.-C. Aubé (1:CNC); Deux Montaignes Co., La Trappe, 29-V-1937, A. Robert (3:CNC; 1:BMNH); Nicolet Co., Blandford, 13-V-1971, E. J. Kiteley (1♂:CNC); Portneuf Co., Cap Rouge, 21-V-1968 (1), 2-VIII-1959 (1), 18-V-1960 (11), 12-VIII-1960 (1) (all J.-C. Aubé:CNC); Quebec Co., Ste. Foy, 15-V-1956, J.-C. Aubé (1♂:CNC); Vaudreuil Co., Choisy, near Rigaud, 25-VIII-1956, Lindberg (1:CNC); Ontario, Grey Co., Owen Sound, 1937, M. Cameron (2:BMNH); Leeds Co., Athens, Lodi township, 27-IX-1945, W. C. Stehr (2:CNC), Athens, 16-VI-1945, W. C. Stehr (1:CNC); Russell Co., La Rose Forest, near Bourget, 29-VI-1967, R. de Ruette (2:CNC); York Co., Toronto, 1928, M. Cameron (7-BMNH); U.S.A.: Maine, Cumberland Co., Ft. Williams, 10-VI-1918, D. L. Bock (1:CNC); Oxford Co., Paris, 4-VII-1915, C. A. Frost (2:MCZ), 5-VII-1933, C. A. Frost (1:MCZ), 4-VII-1916, C. A. Frost (2:CNC); New Hampshire, Grafton Co., Franconia (1:MCZ), A. T. Slosson (1:AMNH); Vermont, Bennington Co., E. A. Schwarz (2:FMNH); Lamoille Co., Smugglers Notch, 27-VII-1936, J. W. Green (1:CAS); Windsor Co., Union Village, ex catbird nest, K. W. Cooper (1:IM); Massachusetts, Franklin Co., Northfield, 12-VIII-1898, F. C. Bowditch (1:MCZ); Middlesex Co., Arlington, 19-V-1924, P. J. Darlington (1:MCZ), Dracut, 21-V-1884 (1:MCZ), Lexington, 4-VI-1926, P. J. Darlington (1:MCZ), Lowell (1:MCZ), Natick, 17-IV-1937, sifting, C. A. Frost (1:CAS), Tyngsboro, 13-VIII-1870 (1:MCZ), 14-VIII-1870 (1♂:MCZ), Tyngsboro, Merrimack River, drift (1:MCZ); Hampden Co., Springfield, G. Dimmock (1:MCZ); Hampshire Co., Northampton, 10-VIII-1973, E. J. Kiteley (1♂:CNC); Norfolk Co., Brookline, 28-V-1888 (1:MCZ), 12-VI-1898 (1:MCZ), 28-IV-1903 (1:MCZ), Wellesley, 14-IV-1891, A. P. Morse (1:MCZ); Plymouth Co., Marion, 10-12-VIII-1902 (1:MCZ), 20-VI-1900 (1:MCZ); Suffolk Co., Dorchester, 10-V-1903 (1:MCZ); Connecticut, New Haven Co., Guildford, 20-IX-1967, J. M. and B. A. Campbell (2:CNC); New York, Bronx Co., Bronx, 17-IV-1904, L. B. Woodruff (1♂, 1♀:AMNH), 10-IV-1908, L. B. Woodruff (1♂:AMNH); Onondage Co., Elbridge, 1-V-1941, N. M. Downie (1:CNC); Queens Co., Long Island, Rockaway Beach, 8-VII-1948, E. Shoemaker (1:USNM); Richmond Co., Staten Island, Willow Brook, 30-XI-1916, splashing bank of brook, L. B. Woodruff (2♀♀, 1♂:AMNH), Watchogue, 4-V-1913, C. L. Pollard (1:CNC); Schuyler Co., Watkins Glen (2:MCZ); Pennsylvania, Allegheny Co. (4:CNC); Monroe Co., Water Gap, A. T. Slosson (1♂, 1♀:AMNH); Northampton Co., Easton, 14-IV-1911, J. W. Green (1:USNM); Philadelphia Co., Manayunk, 1-X-1903 (1:CNC), 5-X-1903 (1:CNC), 21-X-1903, (1:CNC); Illinois, Champaign Co., Brownfield Woods, 29-30-VI-1966, u.v. light, Allen and Rotramel (1♂:UAF); Coles Co., Fox Ridge State Park, 29-IV-1944, Ross and Wyatt (1:INHS); Cook Co., Chicago (1:AMNH); Henry Co., Alogonquin, 7-V-1907, Nason (2:INHS); Union Co., Pine Hills Field Station, 15-22-V-1967, J. M. Campbell (1:CNC); Wisconsin, Milwaukee Co., Milwaukee, 8-IX, H. van Emden (1♀:BMNH); Iowa, Johnson Co., Iowa City, H. F. Wickham (3:USNM); Nebraska, Douglas Co., Omaha, Childs Point, 11-X-1908, F. H. Shoemaker (1:CNC); Oregon, Benton Co., Blodgett, 20-VI-1927, P. J. Darlington (1♂:MCZ); New Jersey, Bergen Co., Hackensack, Wintersteiner (1:CAS); Kentucky, Butler Co., Logansport, 16-VIII-1968, J. M. and B. A. Campbell (1:CNC); Missouri, St. Louis Co., St. Charles (1:CNC); Monroe Co., Paris, 4-IX-1947, C. A. Frost (1:IM); Kansas, Douglas Co. (1♀:AMNH); (2:SMKU), Lawrence, R. Thaxter (65:MCZ); Colorado, El Paso Co., Colorado Springs, 20-26-VII-1896, H. F. Wickham (1:MCZ), 15-30-VI-1896, H. F. Wickham, 1,830-2,140 m (1♂:USNM); Fremont Co., Canon City, H. F. Wickham (1♂:MCZ); Garfield Co., Glenwood Springs, VIII (1♂:CAS); Boulder Co., Eldorado Springs, 12-VII-1939, J. W. Green (1:CAS); [? Morgan Co.], Deer Creek Canyon, 13-VII-1938, J. W. Green (6:CAS); Utah, Utah Co., Provo, VI-1896, H. F. Wickham (1♂:MCZ); Maryland, Baltimore Co., Baltimore, 10-VII-1909, F. E. Blaisdell (3:CAS), 19-VII-1909, F. E. Blaisdell (1♂:CNC); Montgomery Co., Plummers Island, 19-IV-1903, H. S. Barber (1:USNM), 11-V-1905, Barber and Schwarz (1:USNM), near Plummers Island, 26-X-1974, J. H. Frank and T. L. Erwin, under stones by stream (4♂♂, 4♀♀:JHFC); District of Columbia, Washington, 30-IV-1893, Chittenden (1:USNM), (4:MCZ); Virginia, Lee Co., Pennington Gap (2:MCZ); Mecklenburg Co., Roanoke River and U.S. hwy. 1, 20-VIII-1930, P. J. Darlington (4:MCZ); Spotsylvania Co., Fredericksburg, 26-IV-1891, W. D. Richardson (1:USNM), 21-VII-1891, W. D. Richardson (1♂:USNM); Stafford Co., Potomac Creek, 21-V-1896 (1:MCZ); W. Virginia, Greenbrier Co., White Sulphur Springs, A. Fenyes (4:FMNH); N. Carolina, Granville Co., Neuse River, 21-VIII-1930, P. J. Darlington; Buncombe Co., Black Mountain, 16-IX-1901 (1♂:AMNH), Swannanoa Valley, 21-VI (1♂:AMNH); Tennessee, Anderson Co., Crawford's Cave, 5 mi. W. of Norris, 15-V-1965, J. A. Payne (1♂:CNC); Carter Co., Elizabethton, 27-IX-1926, J. W. Green (1:CAS); Davidson Co., Nashville, 4-15-VIII-1897 (1:MCZ; 3:USNM); Sevier Co., Smoky Mountains, state road to Newfoundland Gap, 1-IX-1930, 1,065 m, P. J. Darlington (3:MCZ); S. Carolina, Kershaw Co., Camden 23-VI-1929, P. J. Darlington (1:MCZ); Georgia, White Co., bank of Chattahoochee River near Helen 15-VI-1978, J. H. Frank (4:JHFC); Florida, (1♀:MCZ); Louisiana, Rapides Par., Magnolia Recreation Area, 15

mi. S.W. of Alexandria, 4-X-1973, pine-hardwood leaf litter near stream, A. F. Newton (1:AFN); Texas, Bexar Co., San Antonio, 25-VI-1942, E. S. Ross (3:CAS; 2:CNC); Colorado Co., Columbus, H. F. Wickham (1 ♂:AMNH; 1 ♀:USNM); Comal Co., New Braunfels, 13-VI-1927, P. J. Darlington (11:MCZ), 21-V-1908 (1:CNC); New Mexico, Sandoval Co., Jemez Mountains, [dates "IV-22; VIII-23; IX-1; X-25"], J. W. Green (6:CAS), VIII, J. Woodgate (1:CNC); Dona Co., Las Cruces, 30-IV-1948, L. D. Beamer (1:SMKU); San Miguel Co., Pecos, VI-1903 (1:SMKU); Santa Fe Co., Santa Fe, VIII (1:CAS); Arizona, Maricopa Co., Cave Creek, 1-VI-1940, G. P. MacKenzie (1:IM); Yavapai Co., Granite Dells, 4-VII-1950, H. Wright (1♂:SMKU); Cochise Co., Chiricahua Mountains, Herb Martyr Camp, 6 mi. S. of Portal, 22-VII-1969, A. Smetana (22:CNC), Chiricahua Mountains, 7 mi. S.W. of Portal, Ash Spring, 23-VII-1969, 6,000 ft., A. Smetana (1:CNC); California, Calaveras Co., Mokelumne Hill, F. E. Blaisdell (4:CAS: 1:CNC), 460 m, F. E. Blaisdell (1:CAS), VII, F. E. Blaisdell (3:CAS), 18-VII-1910, F. E. Blaisdell (1:CAS); Fresno Co., Herndon, 20-VIII-1918 (1:CAS); Lake Co., Lakeport, 4-VI-1922 (1:CAS); Marin Co., Fairfax, 13-VI-1905 (1:CNC), 7-V-1911, F. E. Blaisdell (1 ♂:CAS), San Anselmo, 16-VI-1904 (1♂:CAS); Monterey Co., Carmel Valley, 5-X-1950, I. Moore (1:CNC), 15-VIII-1956, I. Moore (1:CNC); Mendoza Co., Hopland, 11-VIII-1956, I. Moore (2:CNC); San Diego Co., Mission Dam, 30-IX-1954, I. Moore (1:CNC), Pine Valley, 20-IV-1955, I. Moore (1:CNC), Poway, F. E. Blaisdell (1:CAS), San Diego (3:CAS), San Vicente Valley, 10-VII-1958, I. Moore (1:CNC), 30-IX-1958 (1:CNC); Alameda Co., Berkeley, 25-II-1919, J. O. Martin (1 ♂:CAS); San Francisco Co., [locality unspecified] (5:CAS), F. E. Blaisdell (2:CAS), San Francisco, 16-VIII-1908, F. E. Blaisdell (1:CNC), 10-V-1913, F. E. Blaisdell (1:CAS), 20-III-1920 (1 ♂:CAS); San Luis Obispo Co., Paso Robles, 10-X-1928 (1:CNC), Cambria Pines, 25-IX-1950, I. Moore (1:CNC), Atascadero, 23-IX-1950, I. Moore (1:CNC); Madera Co., Bass Lake, 24-VII-1934, F. E. Blaisdell (4:CAS); San Mateo Co., Pt. San Pedro, 5-IV-1910 (3:CAS); Contra Costa Co., Marsh Creek Springs, 22-V-1954, H. B. Leech (2:CAS), Moraga, 10-II-1932, E. S. Ross (1:CAS); Sonoma Co., Camp Meeker, 12-VIII-1906 (1:CAS; 1:CNC), Guerneville, 29-V-1908 (1:CAS), 12-VIII-1906 (1:CNC), Guerneville, Duncan Mills, 14-VII-1908, F. E. Blaisdell (1 ♂:BMNH); Riverside Co., Riverside, 17-IV-1905 (1:CAS); Orange Co., San Juan Canyon, 11-V-1960, 230 m, E. I. Schlinger (1:IM); Shasta Co., Anderson, 10-VII-1967, cow dung, E. F. Legner (1 ♂:IM); (lectotype ♂ of *Actobius ocreatus*:MCZ); Los Angeles Co., Azusa, IV (1:CAS), Pasadena, A. Fenyes (1:FMNH), V (3:CAS), Eaton Canyon, 1-VIII-1972, R. H. Crandall (1:IM), Los Angeles, 14-VIII-1890 (1: SMKU), Redondo, 29-VI-1905 (1:CAS); MEXICO: Chihuahua, Majaica road, 30 mi. N.W. of Chihuahua, 17-IV-1961, 1,525 m, Howden and Becker (1:CNC); Nuevo León, Chipinque Mesa, near Monterrey, 23-VII-1963, 5,400 ft., H. and A. Howden (1♂:CNC); Zacatecas, 1.3. mi. S. of Sain Alto, hwy. 45, 10-I-1966, about 1,980 m, D. R. Whitehead (1♂:JHFC); Aguascalientes, Arroyo San Francisco, 2.8 mi. S. of Aguascalientes, hwy. 45, 16-I-1966, about 1,675 m, D. R. Whitehead (2♂♂, 1♀:JHFC); Guanajuato, Sallé (2♂♂:BMNH); Mexico D.F., Höge (1 ♂:BMNH), Mexico City, Flohr (1 ♂:BMNH); Morélos, Yautepec, Flohr (1♀:BMNH); Puebla, Tehuacan, Höge (1♀:BMNH), Puebla, Sallé (1♀:BMNH) (lectotype ♂ and paralectotype ♀ of *Actobius arduus*:BMNH) Veracruz, Orizaba, XII-1887, Salvin and Godman (1 ♂:BMNH), San Andres, Chalcicomula, Höge (1♂:BMNH), Xalapa, Höge (1 ♂, 1♀:BMNH), Córdoba, Sallé (1♀:BMNH), A. Fenyes (2♂♂, 1♀:CAS), Mirador, Höge (1♀:BMNH), 13.2 mi. W. of Ciudad Mendoza, route 150 D, 22-VI-1966, 2,010 m, G. E. Ball and D. R. Whitehead (1 ♀:JHFC); Oaxaca, hwy. 131, 105 km S. of Oaxaca, 11-V-1971, 2,135 m, J. M. Campbell (12:CNC), 127 km S. of Oaxaca, 11-V-1971, 1,830 m, J. M. Campbell (9:CNC), 9 mi. N.E. of Oaxaca, on hwy. 175, 7-20-VIII-1973, 1,890 m, leaf letter, stream edge, A. F. Newton (4♂♂, 6 ♀♀:AFNC); Chiapas, El Rincón, 13-14-V-1969, J. M. Campbell (5:CNC), San Cristóbal de las Casas, 5-V-1969, 2,195 m, J. E. H. Martin (1:CNC), Lagos de Colores, 12-V-1969, J. M. Campbell (2:CNC); GUATEMALA: Baja Verapaz, San Jerónimo, H. G. Champion (6 ♂♂, 1 ♀:BMNH); Alta Verapaz, Balheu, H. G. Champion (1 ♀:BMNH), Tactic, H. G. Champion (1♂:BMNH); Solola, Panajachel, 1,525 m, H. G. Champion (1 ♂:BMNH); Quezaltenango, Cerro Zunil, 1,220 m, H. G. Champion (1 ♂:BMNH); Guatemala, Guatemala City, H. G. Champion (2♂♂, 1 ♀:BMNH); COSTA RICA: Cártago, 21-XI-1909, sweeping over grass, P. R. Calvert (1 ♂:BMNH) Puntarénas, Coronado, 10-VIII-1923, 1,400-1,500 m, F. Nevermann (1 ♂:USNM); VENEZUELA: ["in valle Araguensi Columbiae", probably Aragua], Moritz (lectotype ♂ and 3 paralectotypes of *Philonthus agnatus*:ISZ); COLOMBIA: Cundinamarca, Bogotá (1♂, 1♀:ISZ); BRAZIL: Pernambuco, Ribeirão, 15-XI-1970, 900 m, J. M. and B. A. Campbell (5 ♂♂, 2 ♀♀:CNC).

REMARKS: I am unable to differentiate the types of *Philonthus agnatus, Actobius ocreatus, Actobius arduus*, and *Neobisnius simulator*, all of which appear to lie well within the limits of variation of North American examples of *Neobisnius sobrinus*. It would not be surprising that a species with such a wide geographical distribution would show marked variation in external characters. Although variation occurs, this appears to be minimal throughout most of the range of the species, and uncorrelated with geographical distribution. However, in southern Mexico and Guatemala the following characters show an unprecedented amount of variation: the shape of the head, the prominence of the microsculpture of the head and pronotum, the color of the body, the color contrast between femora and tibiae, and the size of the individuals. I am unable to correlate variation in 2 or more characters in any consistent way, nor in a single character with geographical distribution.

More remarkable is that in 2 of the ♂ examples from Mexico: (Mexico City, Flohr; Veracruz, San Andres Chalcicomula, Höge) both of which are from the Sharp collection in BMNH, the former without an identification label but placed with examples labelled *Actobius arduus*, the latter with an identification label as *Actobius concolor*, the aedeagus (fig. 46) is of distinct form. The furcae of the paramere are significantly elongate and appear bevelled at the outer angles of their apices. This

difference would expectedly correlate with differences in external characters and would indicate a distinct species, particularly because I have not been able to assemble a series of examples showing progressive elongation of the paramere. However, this seems not to be the case, for the example from Mexico City is smaller, paler, with a more elongate head, more slender and the apex of the median lobe of the paramere is less narrowed, less elongate, than the other example.

The 2 opposing conclusions which might be drawn are (a) that several extremely similar species occur in southern Mexico and Central America, and that I have not discovered the appropriate characters for their discrimination, and (b) that *sobrinus* is, for some reason, genetically highly variable in that part of its range. For the present I tend to the latter view, but I do not believe that the question will be resolved easily.

If the 2nd conclusion is correct, the *concolor* could be an extreme variant of *sobrinus*, attaining its distinctive appearance only at higher elevations of the Volcan de Chiriquí in Panama. If morphological variants occur at higher elevations in Panama, then they could occur at higher elevations elsewhere in Central America. For example, the 3 related species with large individuals: *fortis, facilis*, and *maximus* might have differentiated, at higher elevations, from the same parental species, or even from *sobrinus* itself; these 3 species clearly are related to *sobrinus*, and examples differ principally by their much larger size. Their aedeagi are very similar to that of *sobrinus*, but are larger and have more peg setae at the apices of the parameral furcae (figs. 40-42) than does that of *sobrinus*. The number of peg setae in these species could be a function of the size of the aedeagus. However, these 3 species are known from so few examples that nothing can be stated about their range of variation.

32. *Neobisnius simplex* (Sharp)

(fig. 47, map 30)

Actobius simplex Sharp, 1885:459 (type locality: Mexico, Veracruz, Mirador)

Neobisnius simplex (Sharp); Bernhauer and Schubert, 1914:324.

Erichsonius simplex (Sharp); Blackwelder, 1944:132.

Neobisnius cavifrons Bierig, 1933:51 (type locality: Panama, Chiriquí, Puerto Armuelles).

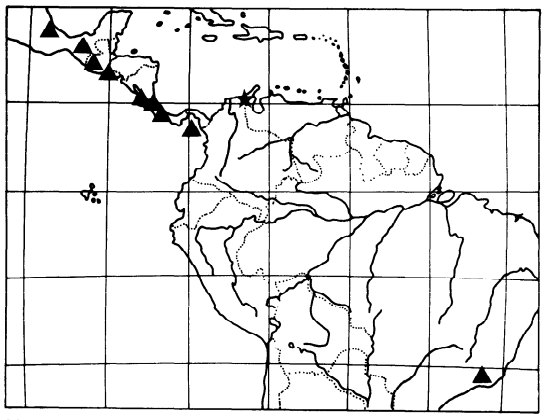
Erichsonius cavifrons (Bierig); Blackwelder, 1944:131. NEW SYNONYMY.

TYPES: Holotype ♂ of *Actobius simplex* in Sharp's collection in BMNH with labels: *Actobius simplex* Type D S. Mirador, Mexico. Höge [written on specimen card]/Type [in red circle on paper disc]/Mirador, Mexico, Hoege/B.C.A. Col. 1.2. *Actobius simplex*, Sharp/Sharp Coll. 1905-313/. The holotype is an immature example, not fully sclerotized. Holotype ♂ of *Neobisnius cavifrons* in Bierig's collection in FMNH with labels: Pto. Armuelles VII-1930 Panama/Typus [green paper]/Field Mus. Nat. Hist. 1966 A. Bierig Colln. Acc. Z-13812/. A paratype of *N. cavifrons* is in the same collection, with identical labels except for the "Typus" label. It is curious that the date of collection of the type and paratype (there is only 1 paratype in FMNH) is given by Bierig (1933) as "Junio 1930" while the labels give the date as VII-1930; I assume that this discrepancy is the result of an oversight by Bierig, so I believe that the supposed holotype is the example so selected by Bierig. Another paratype (♀), labelled "cotype", is in BMNH; the locality label (which is one of Bierig's) bears no date.

DESCRIPTION: Length 4.7-5.2 mm. Head dark castaneous to nigrous; pronotum castaneous to piceous; elytra dark castaneous to nigrous with apical margin scarcely at all paler; abdomen castaneous to piceous with apical margin of each segment slightly paler; legs flavo-ferruginous, tibiae infuscate; trophi ferruginous to infuscate; antenna dark fusco-ferruginous, with articles I-II slightly to distinctly paler.

Head slightly elongate; eye occupying 0.35 of length of side; sparsely but distinctly punctate; surface shining between punctures and with microsculpture scarcely evident; only very slightly narrowed behind the eyes; ♂ with frontal fovea poorly marked at front of distinct longitudinal groove, but with group of setae. Pronotum anteriorly as broad as head behind eyes; elongate (about 0.2 longer than broad); narrowed posteriorly; sinuate laterally so the narrowest width is before the hind angles; sparsely punctate as head; surface shining between punctures; microsculpture very inconspicuous to absent. Elytra not much broader than pronotum; longer than jointly broad; slightly broader posteriorly; finely, not very densely, punctate. Abdomen not greatly narrower than elytra; broadened to segment VI; anterior transverse depressions of terga III-VI with distinct and quite coarse tuberculate punctures; apical notch of sternum VIII of ♂ broad and shallow. Antenna with article II scarcely broader than III; penultimate article slightly transverse. Aedeagus (fig. 47) acuminate, and acute at apex.

DISTRIBUTION (map 30): Eastern Mexico southwards to Panama and Brazil.



Map 30. Distribution of *N. simplex* in Mexico, Central and South America

RECORDS: MEXICO: Veracruz, Córdoba, A. Fenyes (1 ♂, 2 ♀♀:CAS), Mirador, Höge (holotype ♂ of *Actobius simplex*:BMNH); Chiapas, junction of routes 190 and 195, 11-V-1969, J. M. Campbell (2 ♂♂, 1 ♀:CNC); GUATEMALA: Escuintla, Torola, 305 m, H. G. Champion (1 ♂:BMNH); Solola, Panajachel, 1,525 m, H. G. Champion (1 ♀:BMNH); Alta Verapaz, Senahu, H. G. Champion (1 ♂:BMNH); EL SALVADOR: La Libertad, Los Chorros, 4 km S. of Santa Tecla, 10-V-1971, funnel extract of leaf litter, S. Peck (1 ♀:CNC); COSTA RICA: Guanacaste, Orosi, 10-V-1940, Marin (1 ♀:FMNH); Cártago, Paraiso, 24-IV-1956, E. F. Legner (1:IM), Turrialba, 24-IV-1956, E. F. Legner (1:IM); PANAMA: Chiriquí, Puerto Armuelles, VII-1930, A. Bierig (holotype ♂, paratype ♀ of *Neobisnius cavifrons:* FMNH); paratype ♀:BMNH); Pearl Islands, San Miguel, H. G. Champion (1 ♂:BMNH); BRAZIL: Rio de Janeiro Squires (2 ♂♂, 1 ♀:BMNH).

REMARKS: The aedeagus of examples of this species is quite distinct from that of its congeners because of the acuminate, acute apex (fig. 47). This character seems invariable. However, the width of the aedeagus varies somewhat, that of the holotype of *Actobius simplex* broader than that of the holotype of *cavifrons*, but the examples from Brazil are intermediate in width. Additionally, the form of the paramere varies slightly, the 2 furcae becoming divergent to a greater or lesser extent. Bierig (1933), in his original description of *cavifrons*, did not compare his material with the description by Sharp (1885) of *Actobius simplex*; I see no reason to believe that *cavifrons* is distinct.

33. *Neobisnius vigii* Frank, NEW SPECIES

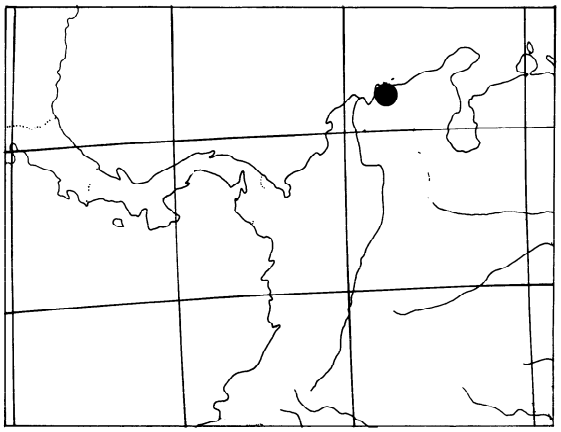
(fig. 48, map 31)

TYPES: Holotype ♂ in CNC with labels; COLOM. Magd. Parque Tayrona, 21 mi. E. Sta. Marta, V-17-1973 Howden and Campbell/ *Neobisnius vigii* ♂ J. H. Frank HOLOTYPE/. Paratype ♂ in ISZ with labels: La Vigi [?]/ *Neobisnius vigii* ♂ J. H. Frank PARATYPE/.

DESCRIPTION: Length 4.0-4.2 mm. Head dark brunneous to castaneous; pronotum pale brunneous to pale castaneous, elytra dark brunneous to castaneous with narrow, pale apical margin; abdomen pale brunneous to pale castaneous with apical margins of terga slightly paler and discs of terga VI-VII slightly darker; legs flavous to flavo-rufous with tibiae infuscate; trophi and articles I-II of antenna fusco-flavous to flavo-rufous with remaining antennal articles picescent.

Head quadrate, rounded behind the eyes which occupy 0.4 of length of side; punctures moderately large, but sparse and shallow; surface shining between punctures and without any obvious microsculpture; head of ♂ with small, shallow frontal fovea marked by long setae. Pronotum anteriorly as broad as head posteriorly; elongate; narrowed posteriorly; slightly sinuate laterally; punctures similar to those of head, not dense; surface shining between punctures and without any obvious microsculpture. Elytra longer than jointly broad, broader than pronotum; finely, sparsely punctate. Abdomen slightly broader at segment VI than at III, narrower than elytra; anterior transverse depressions of terga III-VI with tuberculate punctures; apical notch of sternum VIII of ♂ large, deeper than wide. Metatarsi shorter than metatibiae. Article II of antenna scarcely broader than III; penultimate article quadrate. Aedeagus (fig. 48) broad but very acuminate, with small, slightly elongate paramere fused to medial lobe.

DISTRIBUTION (map 31): Northwestern South America.



Map 31. Distribution of *N. vigii* in Colombia

RECORDS: COLOMBIA: Magdalena, Parque Tayrona, 21 mi. E. of Santa Marta (holotype ♂:CNC).

REMARKS: The holotype is teneral and has the aedeagus feebly sclerotized and shrivelled. The paratype ♂ evidently was collected many years ago and is discolored and dusty; in attempting to remove the accumulated dust and dirt I have dislodged some setae. Probably, neither example shows the typical coloration, the holotype because of its teneral condition and the paratype through discoloration. The collection locality of the paratype is obscure; the specimen bore only a handwritten label appearing to read "La Vigi"; but in the same collection with it (in ISZ) was an example of *sobrinus* with a label "Bogota" apparently in the same handwriting. It is therefore possible that the paratype was collected in Colombia or neighboring Venezuela. The only place names of similar, but not identical form I have been able to locate in these countries are Vijes in the Department of Valle in Colombia and El Vigia in the State of Merida in Venezuela. Because of the uncertain collection locality, it seemed preferable to designate the example from Parque Tayrona as holotype, even though this is a teneral individual.

The distinct form of the aedeagus separates the species clearly from all other New World *Neobisnius* known to me. Because of the existence of the frontal

fovea, even though this is shallow, the species appears to belong to either the *semirufus* group or the *occidentoides* group. Because of the very acuminate median lobe of the aedeagus (about as acuminate as that of *simplex*) and the fusion of the paramere to the median lobe (slightly resembling that of *edznai*), as well as general similarity of external structures to those of *edznai*, I have placed *vigii* tentatively in the *occidentoides* group between *simplex* and *edznai*.

The name of the species is derived from the cryptic label appearing to read "La Vigi".

34. *Neobisnius edznai* Frank, NEW SPECIES

(fig. 15, 49, map 32)

TYPES: Holotype ♂ (now in BMNH) with labels: MEXICO: Campeche, Edzná, marsh, 150'. IV.22. 1966/George E. Ball, D. R. Whitehead collectors/ *Neobisnius edznai* ♂J. H. Frank HOLOTYPE/. All other examples listed under records are paratypes and are so labeled.

DESCRIPTION: Length 4.0-4.2 mm. Head nigropiceous; pronotum castaneous; elytra and abdomen piceo-castaneous; apical margin of elytra narrowly flavescent; apical margins of abdominal segments narrowly rufous; legs flavo-ferruginous; trophi and antennal articles I-II and base of III flavo-ferruginous, remaining articles picescent.

Head quadrate, narrowed behind eyes each of which occupies 0.4 of length of side; punctures moderately large, not very dense; surface shining between punctures and without obvious microsculpture. Pronotum anteriorly as broad as head posteriorly; elongate; narrowed posteriorly; slightly sinuate laterally; punctures rather finer than those of head, not dense; surface shining between punctures and without any obvious microsculpture. Elytra longer than jointly broad; broader than pronotum; finely and not very densely punctate. Abdomen almost linear; narrower than elytra; anterior transverse depressions of terga III-VI with very distinct tuberculate punctures; apical notch of sternum VIII of ♂ large and deep. Tarsi short in relation to tibiae. Article II of antenna scarcely broader than III; penultimate article quadrate. The aedeagus of this species (fig. 49). is of unusual form: the paramere appears fused to the median lobe as a ridge.

DISTRIBUTION (map 32): Eastern Mexico southwards to northern Guatemala.

RECORDS: MEXICO: Campeche, Edzná, 22-IV-1966, marsh, 45 m, G. E. Ball and D. R. Whitehead (holotype ♂, paratype ♀:BMNH; paratype ♂ and ♀:MCZ), 31.8 mi. W. of Escarcega, 14-15-IV-1966, 60 m, G. E. Ball and D. R. Whitehead (2♂♂, 1 ♀:JHFC); Veracruz, Dos Amates, 16-17-VI-1969, D. E. Bright and J. M. Campbell (1♂:CNC); GUATEMALA: Baja Verapaz, San Jerónimo, H. G. Champion (1 ♀:BMNH).

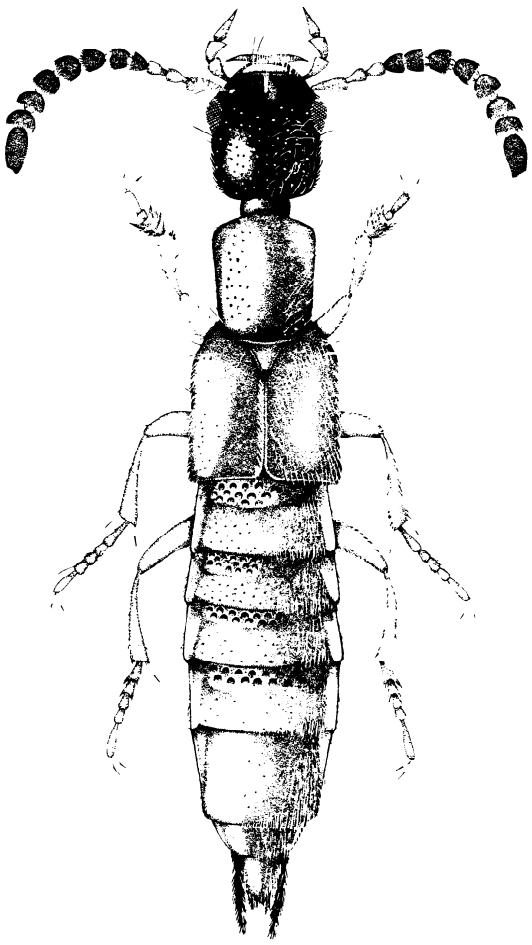
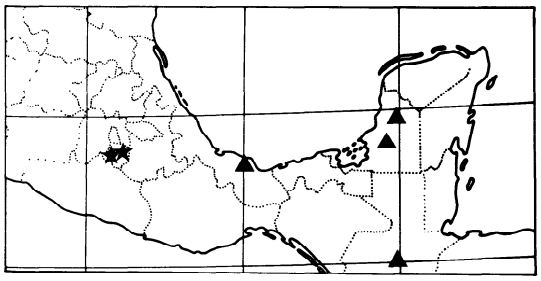


Fig. 15. Habitus of ♂ *N. edznai* Frank. Length 4.0-4.2 mm.



Map 32. Distribution of *N. edznai* in Guatemala and southern Mexico

REMARKS: The name of this species is derived from the type locality. The small size, dark color, and distinct habitus of individuals of the species should enable them to be distinguished from those of all other Mexican and Central American species; the form of the aedeagus is distinctive (fig. 49).

The habitus is of the same general form as that of *senilis*. The tuberculate punctures of the abdomen are pronounced and the frontal fovea of the head of the♂ is distinct. The true position of the species could be in the *semirufus* group or in the *occidentoides* group or

distinct from both of these groups; it is possible that it might be decided by examination of the larva (if this were known) and by comparison with the larvae of the 2 species groups mentioned. For the present, I have placed it close to *moestus* and *senilis* because of resemblance in adult external characters.

35. *Neobisnius moestus* (Sharp)

(map 33)

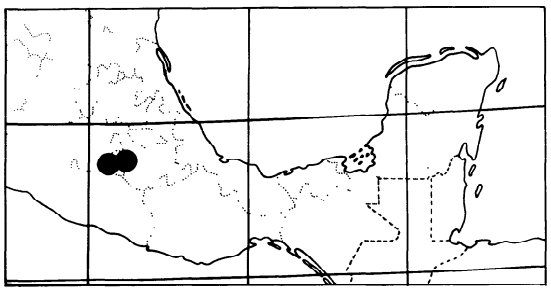
Actobius moestus Sharp, 1887:790 (type locality: Mexico, Mexico D.F., near Mexico City).
Neobisnius moestus (Sharp); Bernhauer and Schubert, 1914:323.
Erichsonius moestus (Sharp); Blackwelder, 1944:131.

TYPES: Holotype ♀ in Sharp's collection in BMNH with labels: *Actobius moestus* Type D.S. Mexico City [written on specimen card]/Type [in red circle on disc]/Mexico City Hoege./B.C.A. Col. 1.2. *Actobius moestus*, Sharp/Sharp Coll. 1905-313/.

DESCRIPTION: Length 4.7 mm. Head and elytra nigro-piceous; pronotum and abdomen piceous, legs piceous with apex of femur, apex of tibia and most of tarsus rufescent; trophi piceous; antenna piceous with articles I-III very slightly paler.

Head quadrate, not much narrowed behind the eyes; eye occupying less than 0.3 of length of side; punctures fine and quite close; without any obvious microsculpture. Pronotum broadest anteriorly; scarcely narrower than head; slightly sinuate laterally; punctate similarly to head; without any obvious microsculpture. Elytra not much broader than pronotum; longer than jointly broad; almost parallel-sided; unusually deeply excised to suture, giving apical margin of each elytron a rounded appearance; finely and densely punctate. Abdomen scarcely narrower than elytra; almost linear; finely and densely punctate except for anterior transverse depressions of terga III-VI which have obsolescent tuberculate punctures. Legs short and stout. Antenna short and stout; article II scarcely broader than III; penultimate article slightly transverse. Male unknown.

DISTRIBUTION (map 33): Central Mexico.



Map 33. Distribution of *N. moestus* in southern Mexico

RECORDS: MEXICO: Mexico D.F., near the city, Höge (holotype ♀:BMNH), 13.9 mi. west of Villa Victoria, route 15, 21-I-1966, ca. 2,440 m, D. R. Whitehead (1 ♀:JHFC).

REMARKS: I have seen no ♂ of this species, therefore I can only guess its relationship to its congeners. Adults share the habitus of those of the *semirufus* and *occidentoides* species groups, but I do not know whether ♂ adults have a frontal fovea. The close punctation and small eyes are reminiscent of *senilis, occidentoides*, and *jucundus*; among these, examples might only be confused with those of *senilis*, from which they are separable by larger size, sparser punctation, and more cylindrical shape.

36. *Neobisnius senilis* (Horn)

(fig. 50, map 34)

Actobius senilis Horn, 1884:226 (type locality: U.S.A., Colorado, Costilla Co., Garland); Bernhauer and Schubert, 1914:325; Leng, 1920:106.
Neobisnius senilis (Horn); Hatch, 1957:175.

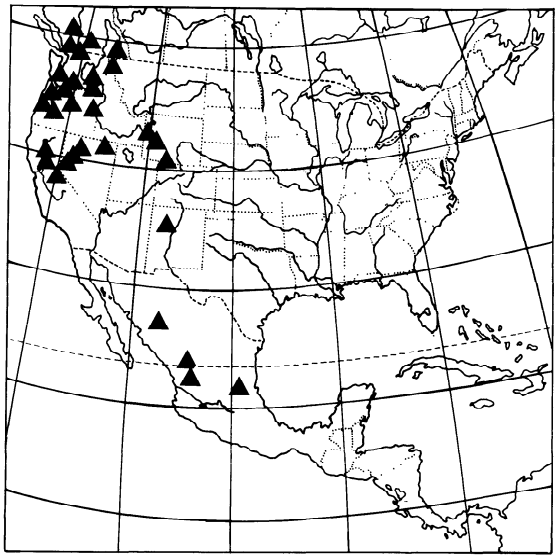
TYPES: Lectotype ♂ in MCZ with labels: Garland 25.6 Col./F. C. Bowditch Coll./*Actobius senilis* Horn lectotype desig. J. H. Frank/; paralectotype ♂ and paralectotype ♀ in same collection with same collection labels; paralectotype ♀ in USNM with labels: Garland 25.6 Col./Coll Hubbard & Schwarz/Cotype no. 4662 USNM [red paper]/ n. sp. near *cinerascens* LeC. fide LeC. 200 Col./*Actobius senilis* fide Fvl./*A. senilis* Horn/. Designation of lectotype and paralectotypes are made here. There is, in Horn's collection in MCZ, a ♂ example labelled: Cal./Lectotype 3106/*A. senilis* Horn/; I do not know who selected this example as lectotype and am not aware of any published designation; I choose not to validate this selection by designation, but to select and designate instead the examples from Garland, Colorado on the basis of the labels present on the example in USNM giving Garland, Colorado as the collection locality of a "cotype". The undesignated "lectotype" in MCZ is undoubtedly of the same species, but its collection locality is not specified.

DESCRIPTION: Length 4.0-4.3 mm. Head piceous to nigrous; pronotum castaneous to piceous; elytra piceous to nigrous and with or without a paler narrow apical margin; abdomen of most examples piceous to nigrous but in some examples castaneous with discs of each segment infuscate; legs picco-castaneous; trophi castaneous to piceo-castaneous; antenna with articles I-III castaneous, but II-III picescent apically, and remaining articles picescent.

Head quadrate to very slightly elongate; narrowed behind eyes, each of which occupies 0.3 of length of side; densely punctate; without any obvious microsculpture. Pronotum anteriorly as broad as head behind eyes; elongate; scarcely sinuate laterally; narrowed posteriorly; with narrow impunctate median line, elsewhere very

densely punctate. Elytra not much broader than pronotum; longer than jointly broad; not much broader posteriorly; finely and very densely punctate. Abdomen not much narrower than elytra; almost linear; finely and densely punctate except in anterior transverse depressions of terga III-VI, which contain tuberculate punctures though these are not very coarse; apical notch of sternum VIII of ♂ shallow, not very broad. Article II of antenna scarcely broader than III; penultimate article quadrate. Aedeagus illustrated by fig. 50, with 5 or 6 peg setae at apex of each parameral furca.

DISTRIBUTION (map 34): Southwestern Canada southwards to northern Mexico.



Map 34. Distribution of *N. senilis* in North America

RECORDS: CANADA: British Columbia, Thompson-Nicola Distr., Kamloops, 12-V-1937, J. K. Jacob (1:CNC); Dewdney-Alouette Distr., Mission City, 7-VI-1953, S. D. Hicks (1:CNC); Cowichan Valley Distr., Duncan, 1-VII-1972, P. J. Darlington (2:MCZ); Central Kootenay Distr., 8 mi. W. of Creston, 10-VI-1968, J. M. Campbell and A. Smetana (20:CNC), 2 mi. S. of Salmo, 9-VI-1968, J. M. Campbell and A. Smetana (1 ♂:CNC), Ymir, 8-VI-1968, J. M. Campbell and A. Smetana (1 ♂:CNC); North Okanagan Distr., Enderby, Shuswap River, 11-X-1946, H. B. Leech (1:MCZ), Vernon, 17-VIII-1943, H. B. Leech (1:MCZ); Kootenay Boundary Distr., Midway, 6-VI-1968, J. M. Campbell and A. Smetana (13:CNC); Okanagan Similkameen Distr., 7 mi. N. of Oliver, 24-V-1958, H. and A. Howden (1:CNC), 4-VI-1958, H. and A. Howden (1 ♂:CNC), 16 mi. W. of Osoyoos, 5-VI-1968, J. M. Campbell and A. Smetana (14:CNC); U.S.A.: Washington, Adams Co., McElroy Lake, 8 mi. S. of Ritzville, 21-VII-1969, on shore of lake, L. H. Herman (1 ♂:AMNH); [? Chelan Co.], Wenass Valley, Pressy's, 7-VII-1882 (1:MCZ); Lewis Co., Packwood, Cowlitz River, 21-23-VII-1969, on shore of river, L. H. Herman (3♂♂, 4♀♀:AMNH); [? Mason Co.], Skokomish River, 13-V-1892 (2:MCZ); Walla Walla Co., 3 mi. S. of College Place, 20-III-1949, G. H. Nelson (1:MCZ); Yakima Co., N. Yakima (1 ♀:USNM); Idaho, Bonner Co., Priest River, VI, H. F. Wickham (1 ♂, 1 ♀:USNM; 6:MCZ); Oregon, Baker Co., Huntington (1:SMKU); Benton Co., Corvallis Watershed, 12-V-1953, V. Roth (2:CNC); Hood River Co., Hood River, 22-IX-1897, A. P. Morse (1:MCZ); Lane Co., 3 mi. N. of Florence, Harbor Vista County Park, 1-VIII-1969, L. H. Herman (1 ♂:AMNH); Wasco Co., The Dalles (1:SMKU; 1 ♀:USNM); Yamhill Co., Dayton, 20-IV-1941 (2:MCZ); Colorado, Costilla Co., Garland, 25-VI, H. G. Hubbard and E. A. Schwarz (lectotype ♂ and 2 paralectotypes: MCZ; paralectotype ♀:USNM), La Veta, H. G. Hubbard and E. A. Schwarz (1 ♀:USNM); Garfield Co., Glenwood Springs, VII (1 ♀:CAS); Pitkin Co., Janeway Campground, 5 mi. N. of Redstone, 29-VI-1972, 1,830 m, near stream, A. F. Newton (2♀♀:AFN); Nevada, Carson City Co., Carson City, 30-VII (1:MCZ); [? Douglas Co.], Lake Tahoe, H. G. Hubbard and E. A. Schwarz (2:USNM); Elko Co., Ruby Valley, 65 mi. So. of Wells, hot spring no. 28 (3:MCZ); Pershing Co., Lovelock, VI, H. F. Wickham (4:MCZ); Washoe Co., 15 mi. N.W. of Reno, 18-X-1968, S. Bleszynski (3 ♂♂, 1 ♀:JHFC), 16 mi. N.W. of Reno, Purdy, 3-XI-1968, S. Bleszynski (1 ♂:JHFC); New Mexico, Sandoval Co., La Cueva, 10-VII-1969, 2,285 m, A. Smetana (1:CNC); California, Mono Co., Coleville, 3-VII-1904 (1 ♀:CAS); Nevada Co., Boca, hwy 80, N.W. of Truckee, 8-X-1968, S. Bleszynski (1 ♂:JHFC), Truckee, VIII, 1,770 m, H. F. Wickham (3:MCZ); Plumas Co., Clover Valley, 17-VI-1923, J. O. Martin (1 ♀:CAS); Shasta Co., Castle Crag, 5-VII-1904 (1 ♀:CAS); Tuolumne Co., Yosemite National Park, Lake Eleanor, VI-1915, H. G. Champion (1:BMNH), 15-17-VII, H. G. Champion (1:BMNH); MEXICO: Sonora, Yecora, 20-22-V-1961, Gibson, Howden and Martin (1 ♂:CNC); Aguascalientes, Arroyo San Francisco, 2.8 mi. S. of Aguascalientes, hwy. 45, 16-I-1966, about 1,675 m, D. R. Whitehead (1♂:JHFC); Zacatecas, 1.3 mi. southeast of Sain Alto, route 45, 10-I-1966, ca. 1,980 m, D. R. Whitehead (1♂:JHFC); Hidalgo, hwy. 85, Río Tula near Tasquillo, 13-XI-1965, 1,615 m, D. R. Whitehead (1 ♂:JHFC).

REMARKS: Examples of this species have the head and pronotum more densely punctate than in any other species known to me; this, together with the dark color should make them easily recognizable. However, some of the examples I have examined from British Columbia have the pronotum pale castaneous and the abdomen pale castaneous with the disc of each tergum infuscate, making them fairly similar in size and appearance to the "parti-colored" adults of *occidentoides* and *jucundus*, both of whose ranges extend to southern Alberta, and that of *jucundus* to southern British Columbia. *N. senilis* adults resemble those of *jucundus* in the shape of the head and the small size of they eyes, but are markedly more densely punctate; however, *occidentoides*, while having a head of less similar shape, is almost as densely punctate. Further, the aedeagus of examples of *occidentoides* is similar with a similar paramere; though generally the 2 rami of the paramere in *senilis* are somewhat divergent, but more parallel in *occidentoides*. Particular care should be taken in separating examples of these closely-related species from British Columbia. I have not seen such pale examples from elsewhere in the range of *senilis*, but examples with castaneous pronotum seem to occur

in all parts of the range, and the single example from Aguascalientes is of this color. I regard the possibility that *senilis* and *occidentoides* might be 2 color forms of 1 species as slight because their ranges overlap widely in the western United States, yet all examples I have seen (except from British Columbia) have been clearly attributable to 1 or other of the 2 species. Additionally, the 2 species are distinct in the size of the eyes and the density of the punctation.

It seems that Horn had seen the Hubbard and Schwarz specimens from Garland, Colorado (from which I selected the lectotype), and that this resulted in his inclusion of Colorado in the published range of the species; it would then also seem likely that he had seen the Hubbard and Schwarz examples from Lake Tahoe, which may have caused the inclusion of Nevada in the range (Horn, 1884). It is not clear to me what examples, if any, he had seen from California in addition to the "lectotype" in MCZ marked simple "Cal.", nor from whence such examples might have come.

The species seems to be restricted to mountainous parts of western North America.

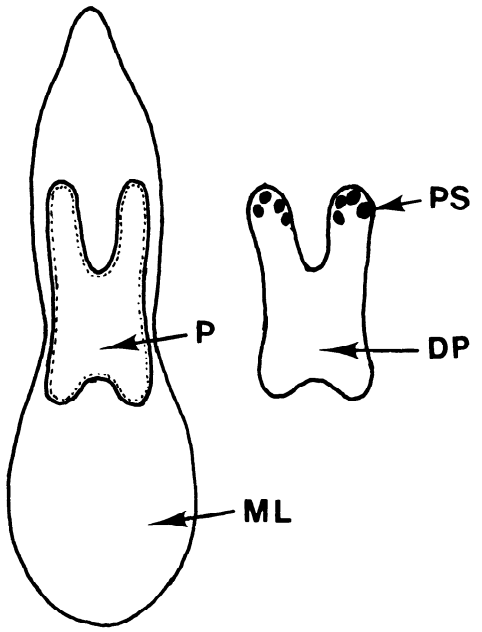


Fig. 3. Enlargement of aedeagus of *N. occidentoides* Frank, showing names of structures: ML median lobe; P paramere; DP dorsal surface of paramere; PS peg setae at apex of paramere.

37. *Neobisnius occidentoides* Frank, NEW SPECIES

(fig. 3, 16, map 35)

TYPES: Holotype ♂ (now in BMNH) with labels: U.S.A. Texas, San Patricio Co., Lake Corpus Christi St. Pk. 1 Dec. 1973/on muddy shore of lake Frank/Murray/ *Neobisnius occidentoides* ♂ J. H. Frank HOLOTYPE/; 2 paratypes with same collection labels in BMNH, 2 in MCZ, 2 in USNM, 2 in AMNH, 2 in CNC, and 2 in FSCA.

DESCRIPTION: Length 4.0-4.2 mm. Head piceous to nigrous; pronotum flavo-rufous; elytra piceous with narrow pale apical (flavescent) margin; terga II-VI flavo-rufous, VII-VIII piceous, VII with pale anterior margin; legs flavo-rufous; antenna with articles I-III flavo-rufous, remaining articles piceous; maxillary palpi flavo-rufous with last article picescent; "parti-colored."

Head quadrate to slightly transverse; eye occupying 0.45 length of side; narrowed behind eyes; punctures of moderate size and dense. Pronotum anteriorly as broad as head behind eyes; narrowed posteriorly; scarcely sinuate laterally; densely punctate with punctures of moderate size; without any obvious microsculpture. Elytra not much broader than pronotum; longer than jointly broad; slightly broader posteriorly; finely and densely punctate. Abdomen almost linear; finely and densely punctate except in anterior transverse depressions of terga III-VI which contain moderate tuberculate punctures; apical notch of sternum VIII of ♂ shallow. Article II of antenna scarcely broader than III; penultimate article quadrate to slightly transverse. Aedeagus illustrated by fig. 3, apex of each parameral furca with 4 peg setae.

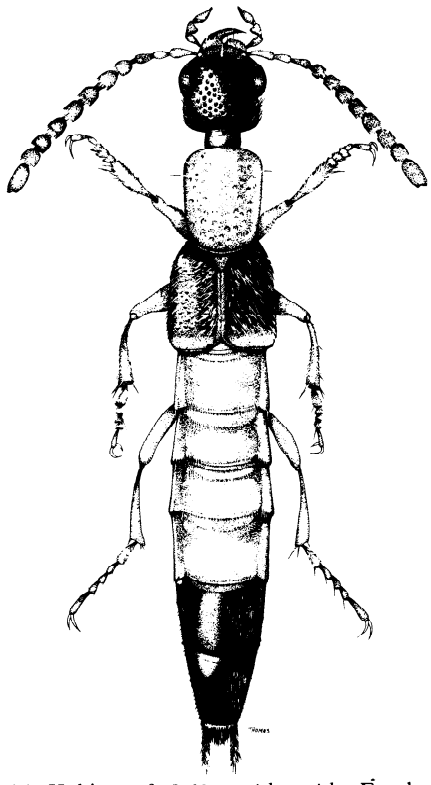
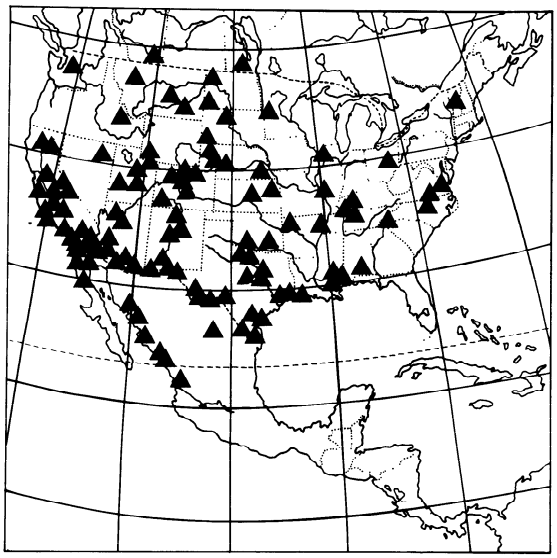


Fig. 16. Habitus of ♂ *N. occidentoides* Frank. Length 4.0-4.2 mm.

DISTRIBUTION (map 35): Western Canada, northern U.S.A. southwards to northern Mexico.



Map 35. Distribution of *N. occidentoides* in North America

RECORDS: CANADA: Manitoba, MacDonald Distr., Baldur, 29-VII-1922, N. Criddle (2:CNC); Alberta, Medicine Hat Distr., 25-VIII-1926, F. S. Carr (1♂:CAS); U.S.A.: Vermont (1 ♂:USNM); New York (1 ♂, 1 ♀:USNM); Ohio, Muskingum Co., 5 mi. S.E. of Zanesville, Muskingum River, 23-IX-1970, L. H. Herman (1 ♂:AMNH); Virginia, Fairfax Co., Mt. Vernon, 13-VII-1909, F. H. Shoemaker (1 ♀:CAS); Mecklenburg Co., Roanoke River and route 1, 20-VIII-1930, P. J. Darlington (2:MCZ); North Carolina, Macon Co., Highlands, VI-1888 (1 ♂:MCZ); Graham Co., Bryson City, Deep Creek, 27-VIII-1930, P. J. Darlington (1:MCZ); Wake Co., Wake Forest, 21-VIII-1930, P. J. Darlington (1:MCZ); Kentucky, Butler Co., near Logansport, 16-VIII-1968, J. M. and B. A. Campbell (3:CNC); Tennessee, Davidson Co., Nashville, 4-15-VIII-1897, H. F. Wickham (2 ♂♂:USNM); Stewart Co., Kentucky Lake, near Model, 8-VIII-1968, J. M. and B. A. Campbell (9:CNC); Missouri (7:SMKU; 1:MCZ); Alabama, Mobile Co., Mobile, VI-1927, P. J. Darlington (3:MCZ), VIII, B. P. Loding (1:MCZ); Covington Co., Florala, 1-VIII-1938, L. Henderson (1:INHS); Mississippi, Harrison Co., Long Beach, Gulf Park College, 26-VI-1968, u.v. light trap (1:FSCA); Illinois, St. Clair Co., Cohokia, 30-X-1899, G. W. Bock (3:CNC); Henry Co., Algonquin, 23-VIII-1908, Nason (1:INHS); Minnesota, Big Stone Co., Odessa Township, 23-VIII-1946, W. C. Stehr (1:CNC); Kansas, Douglas Co., 27-IX-1932, M. W. Sanderson (1 ♀:AMNH), F. H. Snow (1:SMKU), Lawrence, R. Thaxter (14:MCZ), 22-VII-1930 (1 ♂:AMNH), 16-IV-1933 (1 ♂:AMNH), 17-VI-1933 (1 ♂, 1 ♀:AMNH), 19-VI-1933 (4♂♂, 9♀♀:AMNH), 7-VIII-1933 (11♂♂, 7♀♀:AMNH), 18-VIII-1933 (3♂♂, 2♀♀:AMNH), 2-X-1937, L. S. Henderson (9:INHS); Leavenworth Co., VII-1933 (4♂♂, 4 ♀♀:AMNH), Tongonoxie, 27-VII-1933 (1♀:AMNH); Saline Co., Salina (2:SMKU); Oklahoma, Comanche Co., Wichita N. F., 28-VI-1938, R. H. Beamer (2:SMKU); Atoka Co., Atoka, 13-15-VI-1896, H. F. Wickham (1 ♂:USNM; 2:MCZ); Arkansas, Washington Co., 18-X-1939, M. W. Sanderson (1:INHS); Mississippi Co., 30-VI-1970 (1), 6-VII-1970 (4), 20-VII-1970 (1), 21-VII-1970 (3), 29-VII-1970 (1), 13-VIII-1970 (1), 17-VIII-1970 (4), 18-VIII-1970 (2), 19-VIII-1970 (2♂♂), 20-VIII-1970 (1), 24-VIII-1970 (1) (all taken in pitfall traps, UAF); Louisiana, St. John the Baptists Par., 4 mi. N. of Laplace, 12-VIII-1972, under debris, Allen and Thompson (1:UAF); Cameron Par., 15 mi. E. of Creole, 18-VI-1948, L. D. Beamer (1♂:SMKU); North Dakota, Williams Co., Williston, 8-9-VI-1896, H. F. Wickham (1 ♂:USNM); Slope Co., Little Missouri River at U.S. hwy. 12, 20-VIII-1970, L. H. Herman (1 ♂:AMNH); Montana, Rosebud Co., Forsyth, Yellowstone River, 21-VIII-1970, L. H. Herman (2♂♂, 2♀:AMNH); Musselshell Co., 38 mi. E. of Roundup, Musselshell River, 24-VIII-1970, L. H. Herman (3♂♂, 3 ♀♀:AMNH); Teton Co., 8 mi. S.E. of Chateau, 2-IX-1970, L. H. Herman (1♂:AMNH); Idaho, Lemhi Co., Salmon River Gorge, 37 mi. S. Salmon, 13-VII-1959, H. B. Leech (1 ♀:CAS); Washington, Pierce Co., Rainier National Park, 20-VII-1949, W. C. Stehr (1:CNC); South Dakota, Carson Co., 4 mi. N.W. of Mobridge, 20-VIII-1970, L. H. Herman (8 ♂♂, 1 ♀:AMNH); Fall River Co., Angostura Dam, S. of Hot Springs, 6-10-VII-1968, H. F. Howden (2:CNC); Nebraska, Lancaster Co., Lincoln, 31-V-1891 (8:USNM); Lincoln Co., 2 mi. E. of N. Platte, 21-VII-1970, Fisher and Orth (1 ♂:IM); Garden Co., Oshkosh, near Platte River, 7-IX-1970, L. H. Herman (1♂:AMNH); Sheridan Co., 14 mi. S. of Hay Springs, Niobrara River, 5-IX-1970, L. H. Herman (4♂♂, 2♀♀:AMNH); Dawes Co., Chadron, 3-VIII-1949, W. C. Stehr (7:CNC); Wyoming, Sweetwater Co., Green River, 1-VIII-1949, W. C. Stehr (2:CNC); Colorado, Larimer Co., Ft. Collins, 15-V-1933, K. W. Maehler (1 ♂:CAS), 29-IV-1933 (1:CNC); Arapahoe Co., Denver, 14-VIII-1902 (1:MCZ), 21-VI-1911, C. A. Frost (2:MCZ), 30-VI-1911, C. A. Frost (3:MCZ); Boulder Co., Eldorado Springs, 12-VII-1939, J. W. Green (2:CAS); Montezuma Co., 6 mi. W. of Cortez, McElmo Creek, 12-VII-1968, E. C. Becker (1:CNC); Morgan Co., Deer Creek Canyon, 13-VII-1938, J. W. Green (23:CAS); El Paso Co., Colorado Springs, 15-30-VI-1896, 1,830-2,135 m, H. F. Wickham (1 ♂:USNM; 1 ♀:AMNH), 20-26-VII-1896, 1,830-2,135 m, H. F. Wickham (1:MCZ); Weld Co., 7 mi. E. of Greeley, S. Platte River, 10-IX-1970, L. H. Herman (1♂:AMNH), Coal Creek Canyon, 11-VII-1938, J. W. Green (24:CAS); Utah, Utah Co., Benjamin, 6-VIII-1960, u.v. light trap, G. F. Knowlton (3:BMNH), Provo, VI-1896, H. F. Wickham (8:MCZ; 1 ♀:AMNH); Millard Co., Fillmore 18-VIII-1968, at light, E. C. Becker (1:CNC), Delta, 14-VII-1947, G. F. Knowlton (1:INHS), Clear Lake, 2-VII-1896, H. F. Wickham (1:MCZ), C. Palm (3 ♂♂, 1 ♀:AMNH); Uintah Co., VII-1937, 1,635 m, Carpenter and Watson (2:MCZ); Wayne Co., 12 mi. S. of Hanksville, 22-VII-1968, H. F. Howden (1:CNC), 14 mi. S. of Hanksville, 3-VIII-1968, at light, sand-oak area, H. and A. Howden (1:CNC), Hanksville, 7-9-VIII-1968, at light, H. F. Howden (5:CNC); Nevada, Elko Co., Elko, H. F. Wickham (1:USNM); Texas, Val Verde Co., Del Rio, 22-27-VI-1896, 955 ft., H. F. Wickham (2:MCZ; 2

♀:USNM), 25-26-IV-1959, E. Becker and H. F. Howden (1:CNC); Comal Co., New Braunfels, 13-VI-1927, P. J. Darlington (3:MCZ); Cameron Co., Brownsville, VII-1896, H. F. Wickham (10:MCZ; 1 ♀:USNM), VI (1:SMKU), 10-XII-1911, river bank (2:INHS), 13-II-1928 (1♂:AMNH); Comanche Co., Proctor and nearby farms, 24-VI-1970, Smith and Hardy (1:IM); Aransas Co., Goose Island Park, 30-XI-1973, along drainage ditch, T. L. Erwin (1 ♂, 1♀:JHFC); Brewster Co., Big Bend National Park, Panther Junction, 29-30-IV-1959, 4,000 ft., at light, Becker and Howden (5:CNC), Big Bend National Park, The Basin, 3-VIII-1963, M. Allender (1 ♀:TAMU); Eastland Co., Cisco, 19-VI-1947, R. H. Beamer (7:SMKU), A. C. Michener (1:SMKU); El Paso Co., El Paso, 8-9-VII-1896, 1,130-1,160 m, H. F. Wickham (1 ♀:USNM), IV (1:CAS), 15-VI-1927, P. J. Darlington (5:MCZ); Brazos Co., College Station, 5-VIII-1968, V. V. Board (1 ♀:TAMU); Harris Co., VI, C. R. Oertel (1:MCZ); Jefferson Davis Co., Fort Davis, 10-V-1959, at light, Howden and Becker (2:CNC); La Salle Co., Cotulla, 12-V-1906, F. C. Pratt, (1 ♀:USNM); Lee Co., Lexington, VII-1908, Birkmann (41:INHS), XI-1908, Birkman (1:INHS), III-1909, Birkman (1:INHS), VII-1909, Birkman (2:INHS), VIII-1909, Birkman (2:INHS); Lubbock Co., 21-X-1970, J. D. Kemper (1:IM); Orange Co., Vidor, 13-VI-1970, R. Phelps (1 ♂:TAMU); Presidio Co., Presidio, 5-VI-1968 (2♂♂), 1-VII-1968 (1 ♀), 2-VIII-1968 (1♂), 21-VIII-1968 (1 ♀) (all by u.v. light trap, J. E. Hafernik:TAMU); San Patricio Co., Lake Corpus Christi State Park, 1-XI-1973, on muddy shore of lake, J. H. Frank, R. and M. Murray (holotype ♂ and 2 paratypes:BMNH; 2 paratypes:MCZ; 2 paratypes:USNM; 2 paratypes:AMNH; 2 paratypes: CNC; 2 paratypes:FSCA; 24 paratypes:JHFC); Randall Co., Palo Dura State Park, 12-VIII-1965, at light, J. E. Schaffner (1 ♀:TAMU); Travis Co., Austin, 15-IV-1924, J. O. Martin (1:CAS); Williamson Co., Taylor, 2-V-1968, u.v. light trap, J. E. Hafernik (1 ♀:TAMU); New Mexico, Bernalillo Co., Sandia Mountains, Cibola N.F., Las Huertas Creek, 8-VII-1969, A. Smetana (2:CNC), Albuquerque, H. F. Wickham (1 ♀:USNM); Colfax Co., Maxwell, 1905, C. E. Bryant (4:BMNH); Dona Ana Co., Mesilla Dam, 25-IV-1924, J. O. Martin (1:CAS), Las Cruces, 12-VI-1950, L. D. Beamer (1:SMKU); Hidalgo Co., Lake Cienega, 26-VII-1965, L. H. Herman (8♂♂, 3 ♀♀:AMNH), Asimas Mountains, Double Adobe Ranch, 15-VIII-1952, H. B. Leech (1♂:CAS), La Cueva, 10-VII-1969, 7,500 ft., A. Smetana (6:CNC), 15 mi. W. of San Ysidro, 10-VII-1969, A. Smetana (7:CNC); San Miguel Co., 15 mi. W. of Las Vegas, 24-VII-1950, J. G. Rozon (1:SMKU); Santa Fe Co., 9-IX-1959, C. Shaefer, (1:MCZ); Sierra Co., Truth or Consequences, 29-VII-1954, I. Moore (1:CNC); Arizona, Cochise Co., Chiricahua Mountains, Herb Martyr Camp, 6 mi. W. of Portal, 22-VII-1969, 1,830 m, A. Smetana (1:CNC); Coconino Co., Grand Canyon, North Rim, 19-VII-1934, 2,440-2,745 m, D. Rockefeller (1♂:AMNH), Bill Williams Fork, F. H. Snow (1:SMKU), Oak Creek Canyon, 9-VII-1941, R. H. Beamer (2:SMKU); Graham Co., Geronimo, 28-IV-1924, J. O. Martin (1 ♂:CAS); Maricopa Co., Phoenix, 29-III-1894 (2:MCZ), 4-VII-1935, R. H. Crandall (1:IM), 15-V-1945, in grasshopper fragments, G. F. Knowlton (2:INHS), Salt River (1:MCZ), 10 mi. W. of Scotsdale, 2-VI-1962, R. F. Sternitzky (21:CNC), Verde River (1:MCZ); Navajo Co., Kayenta, 10-VII-1935, C. T. Brues (1:MCZ), Show Low, 21-VII-1940, O. Bryant (3:CAS), 11-XI-1941, O. Bryant (1:CAS), Lakeside, 9-VI-1946, G. P. MacKenzie (1:IM); Pima Co., Mt. Lemmon, 29-IV-1948, L. D. Beamer (1:SMKU), Tucson (2:MCZ), 5-IV-1897 (1:CAS), 1-V-1933 (13: CAS), 15-XII-1933 (1:CAS), 10-II-1935 (1:CAS), 17-II-1938 (1:CAS), 17-III-1940 (2:CAS), 1-XI-1940 (1♂:CAS), Santa Catalina Mountains, 8-V-1933 (3:CAS), 14-V-1933 (2:CAS), Arivaca Creek at Arivaca, 31-VII-1952, Leech and Green (1:CAS); Pinal Co., Picacho, 19-IV-1933 (2:CAS), Oracle, 24-VIII-1934, 4,500 ft., I. Moore (1:CAS); Santa Cruz Co., Amado, 3-XI-1953, I. Moore (3:CNC), Nogales, 10-XI-1906 (3:CAS), 11-XI-1906 (3:CAS); Yavapai Co., Bumble Bee, 13-VI-1919, E. Schiffel (3:CAS), Red Rock Camp, 15-VIII-1968, D. E. Bright (2:CNC); Yuma Co., Yuma, 7-IV-1879, 45 m (9:INHS), Gila River Valley, 12 mi. N.E. of Yuma, 29-V-1961. H. F. Howden (8:CNC); California, Calaveras Co., Mokelumne Hill, VII, F. E. Blaisdell (1:CAS), 18-VII-1910, F. E. Blaisdell (1 ♂:CNC); Fresno Co., Waltham Creek, 4 mi. W. of Coalings Hot Springs, 17-IV-1954, 760 m (3:CAS), Herndon, 20-VIII-1918 (1♂:CAS); Inyo Co., Big Pine, III-1971, under logs at river's edge, D. Giuliani (1:IM), VI-1970, u.v. light, D. Giuliani (1:IM), Fish Springs, 28-V-1971, around edge of small pond, D. Giuliani (1:IM), Independence, 17-VII-1896, H. F. Wickham (2:MCZ), Little Black Rock Spring, XI-1970, under board, dry area, D. Giuliani (1 ♂:IM), Lone Pine, 15-18-VI-1923, R. Hopping (4:CAS); Imperial Co., 1911, J. C. Bridwell (1 ♂:USNM), Brawley, 29-VI-1952, I. Moore (4:CNC), 29-VII-1958, vacuum trap in alfalfa, E. I. Schlinger (1:IM), 18-IX-1958, E. I. Schlinger (2:CNC), 29-I-1959, *Medicago sativa*, E. I. Schlinger (1:IM), 13-VIII-1959 (1:IM), Calexico, 15-X-1958, alfalfa field, E. I. Schlinger (1:IM), 10-VI-1958 (1), 16-VI-1958 (1), 18-VI-1958 (3), 19-VI-1958 (1) (all by vacuum cleaner trap in alfalfa field, E. I. Schlinger:CNC), 1.5. mi. E. of Calexico, 5-6-1961, at light, H. F. Howden (14:CNC), Algodones Dunes, 13-IV-1968, associated with *Sphaeralcea*, R. Hobza (1:IM), E. Centro, 26-I-1910, F. E. Blaisdell (7:CAS), 6-XII-1927, F. E. Blaisdell (2:CAS; 6:MCZ), 6-XII-1928, F. E. Blaisdell (2:CAS), 29-IV-1952, I. Moore (7:CNC), 3.5 mi. N.W. of Glamis, 13-IV-1968, at light, P. A. Rauch (1:IM), Holtville, 9-V-1940, R. P. Allen (1 ♀:CAS), Imperial Valley, II-1911 (1 ♂:USNM), Sebley, 30-IV-1954, I. Moore (2:CNC), 1 mi. W. of Westmorland, Jack Brothers Ranch gate 129, 5-IX-1963, ex cotton suction machine, R. T. Reynolds (1:IM), Yuma, 5-7-VIII-1896, H. F. Wickham (5:MCZ; 1 ♂:CAS), 2-IV-1904 (2:CAS), 20-V-1932 (1♂, 1♀:USNM); Kern Co., 12 mi. S. of Bakersfield, 20-V-1958, E. I. Schlinger (1:CNC; 1:IM), 11-VIII-1958, alfalfa field, E. I. Schlinger (1:IM), 30-IX-1958, by vacuum cleaner in alfalfa field, E. I. Schlinger (1:CNC), Bakersfield, V-1912, E. Schiffel (2:CAS); Los Angeles Co., Altadena, 18-VIII-1964, R. H. Crandall (1:IM), Azusa, IV (1:CAS), Los Angeles (5:MCZ), Palmdale, 9-VI-1918 (2:CNC; 2:CAS), Pasadena, I (2:CAS), Pasadena, Eaton Canyon, 1-VIII-1972, R. H. Crandall (1:IM), San Clemente Island, 18-VI-1938, T. D. A. Cockerell (1:CAS), San Clemente Island, Wilson's Cove, 21-VI-1938, J. T. Scott (1:CAS), San Clemente

Island, 7 mi. S. of H.Q., 12-VI-1971, B. S. Cheary (1 ♂:IM), Redondo, IV (1:CAS), Rivera, 14-IV-1918 (1:CAS), San Marino, 4-IV-1932, G. P. MacKenzie (1:IM), Santa Monica, 1-V-1979 (1:INHS), Tujunga Canyon, 15-V-1946, G. P. MacKenzie (1 ♂:IM); Lassen Co., Amedee, 21-28-VII-1896, H. F. Wickham (1 ♂:USNM); Madera Co., Bass Lake, 18-VII-1934 (8:CAS); Mariposa Co., Yosemite, 1-VIII-1940, L. J. Lipovsky (28:SMKU); Mendoza Co., Hopland, 11-VIII-1946, I. Moore (1:CNC); Mono Co., Casa Diablo Hot Spring, 23-IV-1971, damp area near springs, D. Giuliani (1:IM); Orange Co., 4 mi. E. of Olive, 14-V-1970, J. Wilcox (1 ♀:IM), [locality unspecified], 14-VIII-1964, E. F. Legner (1 ♀:IM); Riverside Co., Blythe, 19-VII-1969, watermelon, G. S. Olton (1:IM), Indio, 17-XII-1932, on decaying date palm tissue, F. S. Stickney (7:USNM), Elsinore, 18-IX-1970, walnut hulls, Z. Skates (1:IM), Hemet, 20-IX-1954, I. Moore (1:CNC), Palm Springs, 6-IV-1932 (1 ♀:AMNH), 13-VIII-1932 (1 ♂:USNM), 9-VI-1916 (1:CAS), Riverside, H. C. Fall (2:MCZ), 17-IV-1905 (1:CAS), 8-VIII-1969, at u.v. light, R. G. and M. C. Malin (1:IM), VII-1972, vacuum trap in alfalfa field, E. I. Schlinger (1:IM), San Jacinto, 3-VIII-1958, vacuum trap in alfalfa, E. I. Schlinger (1:IM), 13-VIII-1958, vacuum trap in alfalfa, E. I. Schlinger (1:IM), Soboba Hot Springs, 18-IX-1954, I. Moore (1:CNC); San Diego Co., Barrett, 7-VI-1950, I. Moore (2:CNC), Borrego, 7-X-1939, G. P. MacKenzie (1:IM), 7-IV-1959, E. I. Schlinger (1:IM), Borrego Springs, 3-VI-1961, O. W. Richards (2:BMNH), 4-VI-1961, O. W. Richards (4:BMNH), Camp Dixon, 27-VI-1950, I. Moore (2:CNC), Campo, 8-V-1959, I. Moore (1:CNC), 11-VI-1950, I. Moore (2:CNC), Campo Creek, 15-IV-1951, I. Moore (3:CNC), 14-IV-1951, I. Moore (1:CNC), Cuyamaca, 11-VI-1961, I. Moore (1:CNC), Dulzura Creek, 27-V-1951, I. Moore (1:CNC), El Cajon, 10-IV-1953, I. Moore (1:CNC) El Monte Oaks, 5-VI-1950, I. Moore (3:CNC), 23-III-1955, I. Moore (1:CNC), Laguna Mountain, 1,525 m, I. Moore (2:CNC), Lake Wohlford, 20-III-1955, I. Moore (2:CNC), Mission Dam, 5-VI-1950, I. Moore (2:CNC), 30-XI-1954, I. Moore (1:CNC), Mission Valley, 31-V-1931, I. Moore (2:CAS), 7-VI-1950, I. Moore (3:CNC), Montezuma Valley, 18-VI-1950, I. Moore (2:CNC), Potrero, 11-VI-1950, I. Moore (3:CNC), Poway, F. E. Blaisdell (3:CAS), San Diego, F. E. Blaisdell (1:CAS), VI, F. E. Blaisdell (3:CAS), VIII, F. E. Blaisdell (1:CAS), 19-VIII-1917 (4:CAS), San Luis Rey River, 1 mi. from coast, 11-V-1968, bank of stagnant pool, S. Freeman (1:IM), San Vicente Valley 4-V-1959, I. Moore (1:CNC), 20-V-1961, I. Moore (1:CNC), Scissors Crossing, 29-VI-1952, I. Moore (1:CNC), Wynola, 19-VI-1950, I. Moore (1:CNC); San Bernardino Co., Colton, 26-28-V-1917, E. P. VanDuzee (1:CAS), Pine Canyon, 15-V-1952 (1 ♂:CAS): San Luis Obispo Co., Atascadero, 15-VIII-1956, I. Moore (1:CNC), Morro Bay Park, 9-IX-1969, decaying seaweed, J. Pinto (1:IM), 8 mi. E. of Morro Bay, 15-VI-1961, at light, H. F. Howden (1:CNC), Paso Robles, 29-VIII-1926, L. S. Slevin (1:CAS), San Joaquin Valley, Tracy, 9-X-1938, B. E. White (3:CAS); Santa Barbara Co., Ynez River, Victoria Station, 13-VII-1971, light trap, 335 m, S. Frommer (1:IM); Shasta Co., Anderson, 10-VII-1967, cow dung, E. F. Legner (1:IM); Stanislaus Co., Adobe Creek, 22 mi. W. of Patterson, H. B. Leech (1:CAS), La Grange, 9-IX-1970, at light (1:IM), 12-IX-1970, at light (1:IM); Santa Cruz Co., Freeman, 3-VI-1905 (1:CAS); Tulare Co., Three Rivers, 5-VIII-1940, E. E. Kenaga (2:SMKU), Woodlawn, 23-VI-1936, F. T. Scott (7:CNC), Sequioa National Park, 25-III-1931, F. T. Scott (1:CNC); Ventura Co., 18-VIII-1964, E. F. Legner (1:IM); Yolo Co., Davis, 10-V-1960, ex dung, J. L. Bath (1:IM); MEXICO: Baja California, 30 mi. S. of Mexicali, 3-VI-1961, H. F. Howden (2:CNC), El Mayor, 14-III-1958, I. Moore (1:CNC), 26-XI-1960, I. Moore (1:CNC), Ojos Negros, 11-V-1951, I. Moore (2:CNC), San Felipe (1:CNC), San Quintin, 7-XI-1955, I. Moore (1;CNC), Santo Domingo, 19-VIII-1950, I. Moore (3:CNC), Tecate, 11-VI-1950, I. Moore (2:CNC); Sonora, Ciudad Obregon, 16-V-1961, H. F. Howden and J. E. Martin (4:CNC), near San José beach, 40 mi. S.W. of Ciudad Obregon, 16-23-V-1961, H. F. Howden and J. E. Martin (1:CNC), 10 mi. N.E. of Ciudad Obregon, 10-VIII-1964, Howden and Lindquist (2:CNC), 16 mi. N.E. of Ciudad Obregon, 13-14-V-1961, H. F. Howden and J. E. Martin (3:CNC), Hermosillo, 15-IX-1963, I. Moore (1:CNC), Noche Buena, 4-XI-1958, I. Moore (13:CNC); Sinaloa, Los Mochis, 5-XI-1958, I. Moore (4:CNC), Aruya, 5-XI-1958, I. Moore (1:CNC), El Limón, 5-XI-1958, I. Moore (1:CNC), Mazatlan, 21-XII-1966, R. H. Crandall (1 ♀:IM), 54 mi. S. of Culiacan, 23-IV-1969, u.v. light, dry wash, M. E. Erwin (1 ♀:IM); Nayarit, 24 mi. S.E. of Tepic, 22-VI-1968, 1,220 m, Hardy, Espinosa and Abrayaya (1 ♂:IM); Coahuila, Salado, near Las Hermanas, 1-VIII-1963, D. R. Whitehead (1 ♂:JHFC).

REMARKS: Adults of this species are the most frequently-collected of the "parti-colored" *Neobisnius* in the western United States. Examples in collections have generally been placed under the name *paederoides*, which properly belongs to a similarly-colored but otherwise different, and largely allopatric species. Use of the key in Horn (1884) would most likely result in the identification of examples of *occidentoides* as *jucundus*; the distributional range of these 2 species overlap, but examples may be distinguished easily by the aedeagus (figs. 3, 51), by the larger eyes, closer punctation, less elongate and posteriorly more narrowed head of *occidentoides*, and by the more pronounced frontal fovea of its ♂ adults. Some examples of *infimus* appear "parti-colored" but have the abdomen more or less unicolorous, segments VII-VIII not darker than the basal segments. Examples of *jocosus*, also "parti-colored", are distinctly larger, and the head is not narrowed behind the eyes, the punctures of head and pronotum are sparser and the ♂ lacks a frontal fovea. Pale examples of *senilis* from British Columbia may be mistaken for *occidentoides*: see remarks concerning *senilis*.

The specific epithet combines *occidens* (meaning both sunset and western) with the suffix—*oides* (resembling), thus meaning resembling the (orange and black color of) the sunset. Consonance with *paederoides* is deliberate, to stress the common color pattern in *paederoides* and *occidentoides*.

38. *Neobisnius jucundus* (Horn)

(fig. 51, map 36)

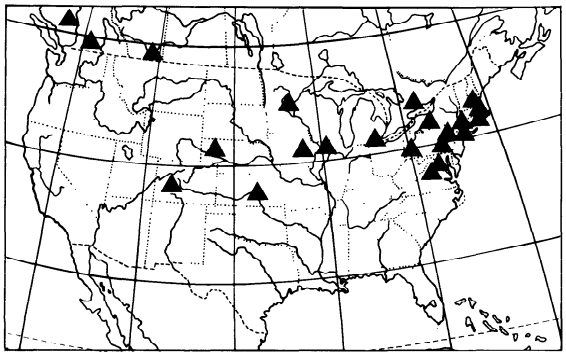
Actobius jucundus Horn, 1884:232 (type locality U.S.A.: South Carolina).
Neobisnius jucundus (Horn); Bernhauer and Schubert, 1914:323; Leng 1920:106.

TYPES: Lectotype ♀, designated here, in Horn's collection in MCZ with labels: Lectotype 3116 [red paper]/*Actobius jucundus* Fvl. S. Carol./.

DESCRIPTION: Length 3.5-3.7 mm. Head piceous; pronotum flavo-rufous; elytra piceo-rufous to piceous with scutellum more or less paler and apical margin narrowly flavescent; terga II-VI flavo-rufous, VII-VIII piceo-rufous to piceous; legs flavous, slightly rufescent; maxillary palpus with penultimate and last articles piceo-rufous; antenna with articles I-III flavo-rufous, slightly infuscate, remaining articles darkly infuscate, picescent; "parti-colored".

Head elongate, not strongly narrowed behind eyes which are small, each occupying scarcely 0.3 of length of side; frontal fovea of ♂ small and shallow but containing a tuft of setae; punctures not very dense, not coarse; strigulose microsculpture scarcely evident. Pronotum anteriorly as broad as head behind eyes; elongate; scarcely narrowed posteriorly; slightly sinuate laterally; punctures and microsculpture much as on head. Elytra scarcely broader than pronotum; more finely and densely punctate than pronotum; hardly broader posteriorly; longer than broad. Abdomen even more densely punctate than elytra; almost linear; anterior transverse depressions of terga III-VI with tuberculate punctures, but these not coarse; apical notch of sternum VIII of ♂ shallow. Article II of antenna scarcely broader than III; penultimate article quadrate. Aedeagus (fig. 51) with small paramere, each furca with 5 or 6 peg setae near apex; median lobe unusually flat, thus appearing strap-like, downcurved before apex.

DISTRIBUTION (map 36): Southern Canada, northern to southeastern U.S.A.



Map 36. Distribution of *N. jucundus* in North America

RECORDS: CANADA: Ontario, York Co., Toronto, VI-1906, R. J. Crew (1 ♀:USNM); Alberta, Medicine Hat, 25-VI-1926, F. S. Carr (1:CNC), 21-VII-1927, F. S. Carr (1 ♀:CAS), 21-VIII-1927 (1:MCZ), Cypress Hills, F. S. Carr (1 ♂, 1 ♀:AMNH), Cypress Hills, Reesor Lake area 27-28-V-1967, J. H. Frank (2:JHFC); British Columbia, Okanagan-Similkameen Distr., Summerland, 1-V-1959, R. E. Leech (1 ♂:CNC); Cariboo Distr., 24 mi. S. of Hundred Mile House, 22-VI-1968, J. M. Campbell and A. Smetana (13:CNC); U.S.A.: New Hampshire, Cheshire Co., Walpole, 31-V-1920, C. A. Frost (2:MCZ); Rockingham Co., Exeter, 6-VI-1925, P. J. Darlington (2:MCZ); Connecticut, Litchfield Co., Cornwall, 6-V-1925, on sandbar, L. B. Woodruff (1:AMNH); Massachusetts, Bristol Co., Somerset, 13-VII-1911, N. S. Easton (1 ♂:MCZ); Middlesex Co., Arlington, 14-VII-1924, P. J. Darlington (1:MCZ), Framingham, 10-V-1908, C. A. Frost (1:MCZ), Natick, 8-V-1909, C. A. Frost (5:MCZ), 9-V-1909, C. A. Frost (1:MCZ), Tyngsboro (3:MCZ), Norfolk Co., Brookline, 1-V-1888 (3:MCZ); Rhode Island, Newport Co., Portsmouth, 24-VII-1908, N. S. Easton (1:MCZ); New York, Kings Co., Brooklyn, 12-V-1907, E. Shoemaker (1 ♀:USNM), 30-V-1907, E. Shoemaker (1 ♀:USNM), 21-V-1910, E. Shoemaker (1 ♀:USNM), 18-V-1914, A. Nicolay (2:AMNH), 25-V-1914, A. Nicolay (1:AMNH), 8-V-1915, A. Nicolay (2:AMNH), Fort Hamilton, 29-V-1916, under stone at edge of salt marsh, L. B. Woodruff (2:AMNH), 25-V-1918, under stones at edge of salt marsh, L. B. Woodruff (2:AMNH); [? Nassau Co., "Long Island"], J. B. Smith (1:USNM); Queens Co., Rockaway Beach, 19-V-1918, under drift, L. B. Woodruff (1:AMNH); Richmond Co., Staten Island, Chittenden (1 ♀:USNM); Tompkins Co., Ithaca, Chittenden (1 ♂, 3 ♀♀:USNM); Westchester Co., Peekskill (2:USNM); Pennsylvania, Allegheny Co. (1:CNC); Bucks Co., 1914 (1:MCZ); Monroe Co., Water Gap, A. T. Slosson (1:AMNH); Northampton Co., Easton, 13-V-1915, J. W. Green (1 ♂:CNC); Michigan, Washtenaw Co., 25-V-1921, M. H. Hatch (2:BMNH); Illinois, Henry Co., Algonquin, Nason (1:INHS); Iowa, Johnson Co., Iowa City, 22-V-1897, H. F. Wickham (1 ♂:USNM); Minnesota, Sherburne Co., Elk River, 16-X-1967, E. J. Kiteley (1 ♂:CNC); Kansas, Saline Co., Salina (1 ♂:SMKU); Nebraska, Garden Co., Oshkosh, near N. Platte River, 7-IX-1970, L. H. Herman (2 ♀:AMNH); Colorado, Chaffee Co., Salida, H. F. Wickham (1 ♂:USNM); New Jersey, Essex Co., Cedar Grove, 5-IV-1925, E. Shoemaker (1:USNM); Maryland, Montgomery Co., Plummers Island, 1905, Barber and Schwarz (1 ♂:USNM); District of Columbia, Washington IV-1897, Chittenden (1 ♀:USNM); Virginia, Arlington Co., Rosslyn, 5-V, Chittenden (1 ♂:USNM); Spotsylvania Co., Fredericksburg, 11-V-1891, W. D. Richardson (1 ♀:USNM); S. Carolina, (lectotype ♀ of *Actobius jucundus*:MCZ).

REMARKS: The species was described by Horn (1884) from 2 syntypes; I have seen only 1 of these, and it is here designated as lectotype. The type locality appears to be at the extreme southern end of the distributional range of the species, which seems to be absent from the

southwestern United States. Horn (1884) mentioned that the pale apical border of the elytra is broader and gradually wider externally; I find this to be frequently, but not invariably true.

The distributional ranges of this species and 3 others with "parti-colored" adults *jocosus, paederoides*, and *occidentoides*) as well as 2 species in which some adults approach this condition (*terminalis* and *ludicrus*) overlap. Adults of *jucundus* are the smallest of them all. Males of only 1 other of these species (*occidentoides*) have a frontal fovea. Males of *jucundus* alone among these species have an aedeagus (fig. 51) with a strap-like median lobe, and a paramere with very short furcae. Adults of *jucundus* alone among the "parti-colored" adults have the head slightly elongate with small eyes and a closely punctured surface.

39. *Neobisnius infimus* (Horn)

(fig. 52, map 37)

Actobius infimus Horn, 1884:227 (type locality: U.S.A., California, vicinity of San Jose); Bernhauer and Schubert, 1914:325; Leng, 1920:106.

Actobius formosus Fall, 1901:221 (type locality: U.S.A., California, Los Angeles Co., Pomona).

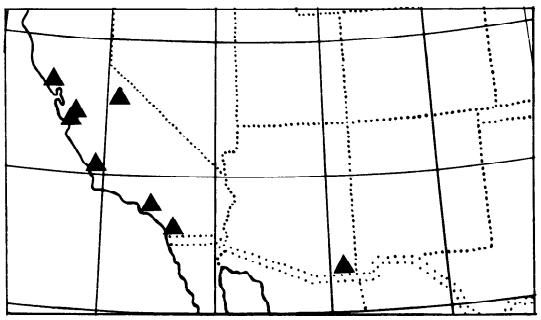
Neobisnius formosus (Fall); Bernhauer and Schubert, 1914:323; Leng, 1920:106. NEW SYNONYMY.

TYPES: Lectotype ♀ of *Actobius infimus* Horn in Horn's collection in MCZ labeled: Lectotype 3107 [red paper]/[gold disc]/*A. infimus* Horn/; 2 paralectotype♂♂ in LeConte's collection in MCZ, each with a gold disc and ♂ label, 1 with red label "Type 7320"; I have dissected the 1 without the "Type" label and remounted it on a 3 × 10mm card; the designations are made here. Holotype ♀ of *Actobius formosus* Fall in MCZ labelled: Pomona Cal./TYPE*formosus*/MCZ Type 24100; paratype ♀ in USNM labelled: ♀/Pomona 5/5 94 Cal./COTYPE/H. C. Fall det./Coll. Hubbard & Schwarz/; paratype ♂ in USNM labelled; ♂/Pom Cal Mts Sep./COTYPE/Coll. Hubbard & Schwarz/*Actobius formosus* Fall MS/; paratype ♂ in CAS labelled: Pomona 5/5 94 Cal./Fall/♂/A. Fenyes Collection/*formosus* Fall/.

DESCRIPTION: Length 4.8-5.2 mm. Head piceous; pronotum flavo-rufous to dark castaneous; elytra rufo-piceous with distinct flavescent apical margin occupying 0.12 to 0.25 of length of elytra; abdomen flavo-rufous to dark castaneous with apical margin at least of segments II-V pale, flavous to rufous; legs very pale to dark ferruginous; trophi ferruginous to dark ferruginous; antenna with articles I-II flavo-ferruginous to ferruginous, remaining articles darkly infuscate.

Head quadrate to slightly elongate; scarcely narrowed behind eyes; coarsely and quite closely punctate except of vertex; surface smooth and shining between punctures; eye occupying slightly more than 0.3 of length of side. Pronotum anteriorly as broad as head behind eyes; elongate; narrowed posteriorly; punctate a little more sparsely than head; the surface smooth and shining between punctures. Elytra not much broader than pronotum; longer than jointly broad; distinctly broader posteriorly; finely and densely punctate. Abdomen slightly widened to segment VI; finely and densely punctate; anterior transverse depressions of terga III-VI with distinct tuberculate punctures; apical notch of sternum VIII of ♂ rather narrow, not deep. Article II of antenna scarcely broader than III; penultimate article slightly elongate. Aedeagus (fig. 52) resembling that of *jucundus* (fig. 51), but with a narrower apex, and the furcae of the paramere smaller, more slender, and more parallel, with 2 peg setae near apex of each furca.

DISTRIBUTION (map 37): Extreme southwestern U.S.A.



Map 37. Distribution of *N. infimus* in western North America

RECORDS: U.S.A.: California, [county and locality unspecified on specimen label, but original description gives "in the vicinity of San Jose", so probably Santa Clara Co., San Jose] (lectotype ♀ and 2 paralectotype♂♂ of *Actobius infimus*:MCZ); Santa Clara Co., Los Gatos, 10-VI-1904 (1 ♀:CAS); San Luis Obispo Co., La Panza, 25-VI-1916, J. O. Martin (1 ♀:CAS); San Diego Co., The Willows, 27-III-1955, I. Moore (1♂:CNC), San Diego, 23-IV-1879 (1:INHS); Sonoma Co., Duncan Mills, 21-VII-1905, F. E. Blaisdell (2 ♀♀:CAS); [? Orange Co.], Santa Ana Canyon, H. F. Wickham (1:MCZ); Tuolumne Co., Yosemite National Park, Lake Eleanor, 15-17-VII-1915, H. G. Champion (1:BMNH); Los Angeles Co., Pomona (holotype ♀ of *Actobius formosus*:MCZ), 5-V-1894, H. G. Hubbard and E. A. Schwarz (paratype ♀ of *Actobius formosus*:USNM; paratype ♂:CAS), IX, mountains, H. G. Hubbard and E. A. Schwarz (paratype ♂ of *Actobius formosus*:USNM), Pasadena, 1917 (1 ♂:CAS), Tujunga Canyon, 6-III-1947, G. P. MacKenzie (1:IM); Arizona, Cochise Co., San Bernardino Ranch, 15 mi. E. of Douglas, 19-VII-1976, at light, P. M. Hammond (1 ♀:BMNH).

REMARKS: The closest relative of this species may be *jucundus*, but individuals are markedly larger, and the aedeagus is distinct (fig. 52 cf. fig. 51). Examples may be distinguished from all other North American *Neobisnius* by the coarse and fairly close punctation combined with the broad pale apical margin of the elytra. There is considerable color variation. Darker forms (e.g., the type of *Actobius infimus*) bear some resemblance to pale examples of *sobrinus* (but are more closely, coarsely

punctate and with a broader, more distinct pale apical margin to the elytra), while paler forms (e.g., the types of *Actobius formosus*) are almost "parti-colored" (lacking only the strong color contrast between abdominal segments II-VI and VII-VIII found in the typical "parti-colored" species). The larger size and more elongate head distinguishes individuals from those of *occidentoides*, the only "parti-colored" species known to have an overlapping distributional range. I have seen too few examples to determine whether 2 distinct subspecies occur; for the present I consider the pale and dark forms to be only color variants.

DISCUSSION

Certain species are particularly well represented in collections and among the material I have examined. These include *occidentoides* with a North American distribution, *ludicrus* with a circum-Caribbean distribution, *sobrinus* distributed from Newfoundland through North and Central America and northern South America, *humilis* in the Greater Antilles, and *scutellaris* and *semirufus* in South America. I equate the large numbers of specimens of these species with the success of the species. Thus I see *occidentoides, sobrinus, ludicrus,* and *humilis* as being highly successful with their respective distributional ranges. With *scutellaris* and *semirufus* I am not so certain of this, because the total quantity of South American material available is small. Interspecific differences in type of habitat occupied are not obvious from the collection records.

North American material is particularly well represented in collections, and so the opposite conclusion may be drawn for the species of which I have seen few examples, namely that *villosulus, lathrobioides, nothocreatus, lepidulus,* and *infimus* are not very successful. This should be so unless these species have a highly specialized way of life, so that the more routine collection methods have failed to produce many specimens, or that any of these species is very recently introduced. *N. villosulus* and *lathrobioides* differ from *nothocreatus, lepidulus,* and *infimus* in having a holarctic distribution, while the other 3 species are very restricted in distribution. *N. villosulus* and *lathrobioides*, with a broad distributional range coupled with rarity of their individuals in the New World, either belong to: a) group of species which evolved early in the phylogeny of *Neobisnius*, occupied a very broad distributional range but was later displaced by more recently evolved groups from much of its former range or b) they belong to a group which evolved early in the phylogeny of *Neobisnius*, in isolation in the Old World, and some of whose species have become established, possibly by the aid of human commerce, in the New World. If they have been introduced, this was almost certainly by multiple introductions. The evidence supporting either of the 2 alternate hypotheses is inconclusive, though I prefer the latter, and I wonder whether the South American *semipunctatus* will be discovered in the Old World.

I have little doubt that the structure of individuals of the *villosulus* group is relatively plesiomorphic in absence of a frontal fovea, and lack of tuberculate punctures of the anterior transverse depressions of terga III-VI of the abdomen. Presence of strigulose microsculpture may also be a plesiomorphic condition for *Neobisnius*, but the presence of an entire (cf. bifurcate) paramere does not fit this concept. I have discussed the evolution of the staphylinine aedeagus with special reference to *Erichsonius* in a manuscript not yet published. It seems to me that the *villosulus* species group, when compared with other New World *Neobisnius*, is worthy of subgeneric status and should be viewed as a phyletic line which evolved early in the evolution of *Neobisnius* and in which the furcae of the paramere fused. Fusion of parameral furcae is found in subgeneric taxa of other Staphylininae, and I presume that the condition is polyphyletic.

The Californian *nothocreatus* represents my concept of an ancestral *Neobisnius*, especially with reference to the structure of the aedeagal paramere and the distribution of peg setae. Its structure may be plesiomorphic for New World *Neobisnius* (except the *villosulus* group) in most respects. However I suspect that "parti-coloration" is an apomorphic character, and some individuals of *nothocreatus* have this color pattern. The *terminalis, gratus, ludicrus, brasilianus, jocosus, scutellaris,* and *demmeli* species groups, some of whose individuals exhibit "parti-coloration", may all be derived from a *nothocreatus*-like ancestor, and together with the *nothocreatus* species groups may form a natural larger grouping of subgeneric rank.

All known males of the *semirufus* and *occidentoides* species groups have a frontal fovea, an apomorphic character. There is little difference between individuals of these 2 species groups, and their separation is as much a matter of convenience as a division based on the apparent standardization of the shape of the aedeagus in the former group and the broadly South American distribution of its species. This standardized form of aedeagus is presaged in the *scutellaris* species group (also South American) and the *demmeli* species group. Thus, the 3 major groupings, of subgeneric rank are: a) the *villosulus* group, b) the *nothocreatus-terminalis-gratus-ludicrus-brasilianus-jocosus-scutellaris-demmeli* groups, and c) the *semirufus-occidentoides* groups.

I have not named subgenera for 2 reasons. Firstly, I am unfamiliar with Old World *Neobisnius* species and cannot guess what additional information on subgeneric groupings will become available when these are studied. Secondly, the lack of a common apomorphic character in group (b) above makes it inadvisable to formalize their classification as a subgenus. Individuals of groups (b) and (c) share the apomorphic character of tuberculate punctures in the anterior transverse depressions of terga III-VI, though there is inter-species-group variation in development of these punctures. Further evidence on the relationships between the groups might be provided by a study of their immature stages.

Despite lack of recognition of *Neobisnius* as distinct from *Erichsonius* until Ganglbauer's (1895) work, there is no close relationship between these genera. Although

adults of both genera have subulate last articles of the maxillary palpus, this is a convergence. The relationship of *Neobisnius* to *Cafius* is much closer; adults of these 2 genera have a mesosternal carina, and the position of the large lateral seta of the pronotum is the same. Relationship of *Neobisnius* to *Cafius, Gabrius, Belonuchus, Hesperus*, and some species of *Philonthus* is suggested by the equally advanced structure of the osmeteria of the 1st abdominal tergum. Osmeteria are present in some other genera of Staphylininae, such as *Trichoderma, Ocypus,* and *Heterothops*, but their structure is simpler (Sulč, 1922) and appears to represent a more primitive stage in their development.

Several facets of the color, structure, and distribution of some *Neobisnius* arouse my curiosity and have potential for studies in ecological genetics. These are outlined below as questions.

Does the evolution of "parti-colored" adults in some species (e.g., *paederoides, jocosus, armuellensis, occidentoides, jucundus*) involve mimicry of the genus *Paederus*?

Some species have dark individuals and paler individuals (e.g., *nothocreatus, ludicrus, senilis,* and *infimus*), and the coloration of the paler individuals approaches that of the "parti-colored" adults mentioned above. What genetic or environmental factors control this coloration?

Dark individuals of *ludicrus* occur in N.W. Florida - Texas, and in Costa Rice - Panama, but are unknown from elsewhere in the range of the species. Are these dark individuals more closely related genotypically to each other than to the widespread paler individuals?

The subspecies *terminalis elegantulus*, with flavo-rufous adults (with dark head), occurs in the arid southwestern U.S.A. Likewise, *gratus* has flavo-rufous adults and a similar range. No other adults of this color pattern occur in the U.S.A. Is the color pattern an adaptation to climate? It is noted that there is only 1 *Paederus* species with adults of similar color pattern in the U.S.A., and it has a similar distribution.

N. paederoides and *gratus* are distinguishable by adult coloration and seem to have disjunct ranges. Will additional collection between the known ranges discover specimens intermediate in color, suggesting conspecificity?

N. occidentoides adults are distinguished from those of *senilis* by size of eyes, and by color, though some individuals of the latter from British Columbia approach those of the former in color. They have complementary ranges. How close is the relationship of these taxa?

N. sobrinus adults show considerable intraspecific variation in Mexico and Central America. The species is related closely to several other species occurring at high altitudes in this area (*fortis, facilis, maximus, concolor*); these 4 species have adults of large size and are known from few individuals. What influences variability in *sobrinus*, and are the other 4 species truly distinct from it?

Was *semipunctatus* introduced into Chile from the Old World? If so, what is its distribution?

The classification of *Neobisnius* needs further study, and this should be approached in part by a world-wide revision of the genus, in part by study of the immature stages, and in part by a revision of Staphylininae on a world-wide basis at the generic level. The present study provides a means of accurate identification of adults for the furtherance of studies in applied entomology, zoogeography, and the taxonomy of Staphylinidae.

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FIGURES

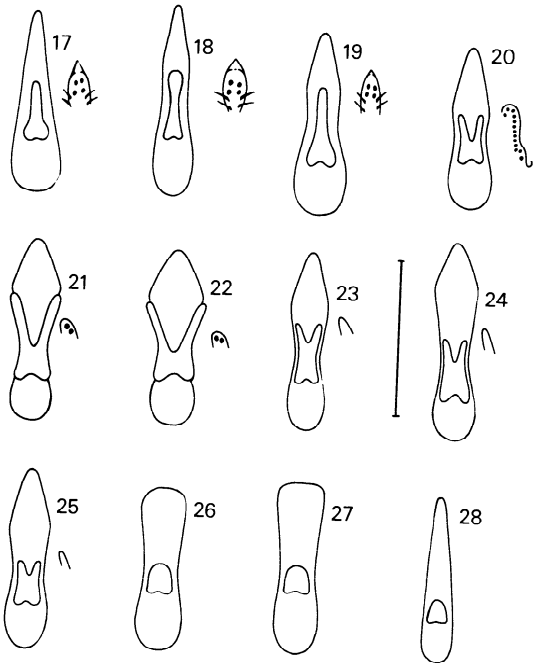

Fig. 17-28. Aedeagus with enlargement of apex of paramere of 17) *N. villosulus* (Stephens), 18) *N. lathrobioides* (Baudi), 19) *N. semipunctatus* (Fairmaire and Germain), 20) *N. nothocreatus* Frank, 21) *N. parcepunctatus* Bernhauer, 22) *N. terminalis* (LeConte), 23) *N. flavomaculatus* Bernhauer, 24) *N. gratus* (LeConte), 25) *N. paederoides* (LeConte); aedeagus showing paramere fused to median lobe of 26) *N. humilis* (Erichson), 27) *N. ludicrus* (Erichson) 28) *N. mixtus* (Sharp). Scale line = 0.5 mm.

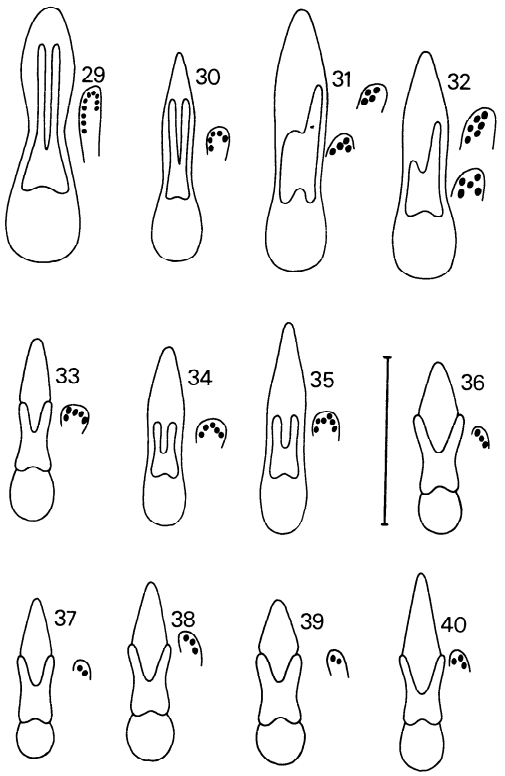

Fig. 29-40. Aedeagus with enlargement of apex of paramere of 29) *N. brasilianus* Wendeler, 30) *N. nigrocoeruleus* Cameron, 31) *N. jocosus* (Horn), 32) *N. armuellensis* Bierig, 33) *N. fraternus* Bernhauer, 34) *N. scutellaris* Bernhauer, 35) *N. omnirufus* Frank, 36) *N. demmeli* Bierig, 37) *N. semirufus* Bernhauer, 38) *N. funerulus* Cameron, 39) *N. nitidulus* (Sharp), 40) *N. richteri* Bernhauer. Scale line = 0.5 mm.

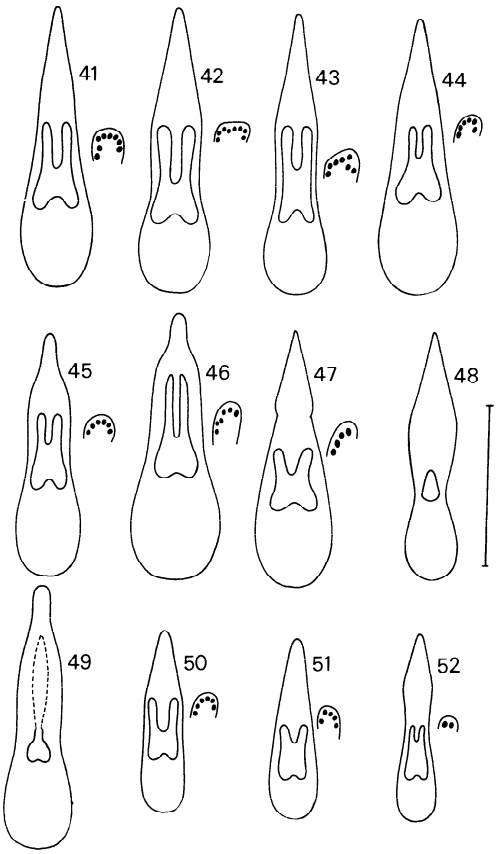

Fig. 41-52. Aedeagus with enlargement of apex of paramere of 41) *N. fortis* (Sharp), 42) *N. facilis* (Sharp), 43) *N. maximus* Bernhauer, 44) *N. concolor* (Sharp), 45) *N. sobrinus* (Erichson), 46) possible variant of *N. sobrinus* (see text), 47) *N. simplex* (Sharp); aedeagus showing paramere fused to median lobe of 48) *N. vigii* Frank, 49) *N. edznai* Frank; aedeagus with enlargement of apex of paramere of 50) *N. senilis* (Horn), 51) *N. jucundus* (Horn), 52) *N. infimus* (Horn).
Scale line = 0.5 mm.

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