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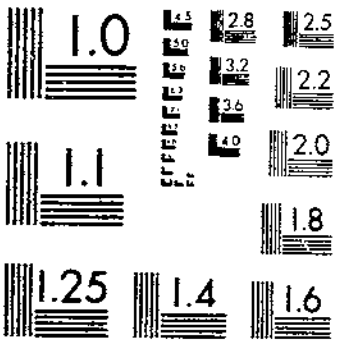

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A Revision of

The New World Species of Powder-Post Beetles Belonging to the Family Lyctidae

By Eugene J. Gerberg

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Contents

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A Revision of

The New World Species of Powder-Post Beetles Belonging to the Family Lyctidae[1]

By Eugene J. Gerberg,[2] collaborator, *Entomology Research Division, Agricultural Research Service*

This revisionary study of the beetles of the family Lyctidae evolved from the lack of adequate descriptions, illustrations, and, most important, keys to enable accurate identification of these economically important insects. All species, including those introduced or intercepted in the Americas and Caribbean islands, are treated. Five genera and twenty-nine species are discussed. As there had been no key to the genera of lyctids of the world, a key to the 12 genera was devised. Whenever specimens were not available, reliance was placed on the original descriptions of genera and species. Keys to the New World species were prepared, and the species have been redescribed and illustrated. This information should be of material aid, as most of the previous taxonomic work on this family consisted of individual descriptions, usually short, vague, and inadequate. The nearest approach to a comprehensive work is that of Kraus (*89*),[3] who discussed 3 genera and 18 species. Since then the apparently indefatigable Pierre Lesne has added a considerable number of new genera and species. In his catalog (*129*) he listed 12 genera and 63 species.

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[3] Italic numbers in parentheses refer to Selected References, p. 46.

The study herein reported has been based largely on material in the United States National Museum and the American Museum of Natural History. It has been handicapped by the fact that many of the type specimens, particularly those of Lesne, are in the Museum of Natural History in Paris, France. The author has not been able to ascertain the location of Reitter's types. The author was fortunate in having over 3,000 specimens of lyctids at his disposal, largely undetermined material. Where material was not available and it was necessary to omit species from the keys, the original description or a translation has been included. This occurs mainly with New World species described by Reitter.

The lyctids have been seldom extensively collected. The main sources of material have been interceptions at the ports of entry or investigations of excessively damaged wood products. Because these insects have been so difficult to determine, adequate records on distribution and host plants have been lacking.

Historical Review

The most recent classification of the family Lyctidae was presented by Kraus (*89*) in 1911. In order to augment his data and furnish a complete history, each of Kraus' references was examined. Other references have been added, and the review has been brought up to date. It is believed that for all practical purposes all literature pertaining to the lyctids has been checked and the significant facts have been recorded.

The first published reference to an insect group under what is now considered the family Lyctidae was made by Geoffroy (*66*) in 1762, when he described "*Dermestes* oblongus fuscus, elytris striatis." Linnaeus (*130*) described as *Silpha fusca* an insect that is believed to be the same species as that described by Geoffroy. Goeze (*67*) described the same insect as *Dermestes linearis*[4] (=*Lyctus linearis* (Goeze)). However, *Dermestes* was assigned to the family Dermestidae. Herbst (*77*) placed this species in the genus *Dermestoides*, but his genus was preoccupied by *Dermestoides* Schffr. Thunberg (*175*) gave a short description of *Dermestes linearis*. Fourcroy (*57*) listed Geoffroy's *Dermestes oblongus*. Olivier (*137*) described the well-known *linearis* (Goeze) as *Ips oblonga*.

Fabricius (*47*) erected the genus *Lyctus* in 1792. His brief description[5] embraced 13 species. Of these, only 1, (*canaliculatus* F.) =*linearis* (Goeze), can be considered as belonging to the genus as now defined. Hellwig (*75*) placed *canaliculatus* in the genus *Synchita* Hellwig. Herbst (*77*) listed 4 species under his newly erected genus *Bitoma*, and included (*Dermestoides unipunctatus* Hbst.) =*linearis* (Goeze). Panzer (*139*) described *Lyctus pubescens*. Paykull (*143*) divided *Lyctus* into 2 "families." He listed

[4] "*Linearis*, das schmale gestreifte Speckkäferchen. Geoffr. Ins. Tom. I . . . p. 103 no. 9 le Dermeste levrier à stries. . . ."

[5] "Palpi quatuor brevissimi filiformes. Maxilla brevis membranacea, bifid. Labium integrum. Antennae clavasolida."

11 species, mostly Fabrician, of which only *canaliculatus* F. can be considered a valid lyctid.

Latreille (*91*) erected the family Xylophages, and grouped within it *Lyctus* F. and *Bostrichus* Geoff. In 1807 he classified *Lyctus* F. under the Bostrychini. Gyllenhal (*72*) listed 3 species under *Lyctus* F.—(*canaliculatus*) =*linearis* (Goeze), *contractus* (=*Bothrideres contractus* (F.)), and *nitidus* (=*Rhizophagus nitidus* (F.)). Duftschmid (*42*) listed 2 lyctids—*canaliculatus* F. and *pubescens* Panz.—in his Fauna Austriaca. Chevrolat (*29*) under Xylophages described (*Lyctus glycyrrhizae*) =*brunneus* (Steph.). Stephens (*171*) more or less arbitrarily lumped the Latreilleian groups of Nitidulariae, Ipsides, Xylophagi, and Erotylenae under the family Engidae. He included the genera *Xylotrogus* Steph. and *Lyctus* F. Faldermann (*49*) described 2 species of lyctids under Xylophages. Comolli (*33*) described 2 more species of *Lyctus* F. Melsheimer (*134*) described (*Lyctus axillaris*) =*linearis* (Goeze), (*striatis*) =*linearis* (Goeze), and *Xylotrogus parallelopipedus*, and placed them all in the family Engidae. Erichson (*44*) believed that *Lyctus* F. should be placed in the Bostrychides, following the genus *Exops* Curt.

In 1854 Wollaston (*188*) placed *Lyctus* F. in the family Colydiidae. He also considered *Xylotrogus* Steph. as a synonym of *Lyctus* F. Lacordaire (*90*) evidently not too sure of the position of *Lyctus* F. placed it in the Cissides, but relegated *Xylotrogus parallelopipedus* Melsh. to the genus *Pycnomerus* Er. of the family Colydiidae. Walker (*182*) described very briefly 3 new species of lyctids under the family Colydiidae. LeConte (*94*) in 1861 described the genus *Trogoxylon*, separating it from *Lyctus* F. on the prolongation of the outer apical angle of the tibia. He placed both genera in the subfamily Lyctidae, family Ptinidae. Pascoe (*141*) described the genus *Minthea* with 3 species, and placed it in the family Colydiidae. Thomson (*174*) divided the family Lyctidae into the tribes Dinoderina and Lyctina. LeConte (*95*) described 3 species of *Lyctus* F. and 1 of *Trogoxylon* LeC. in the family Cioidae, and listed 21 species of lyctids. Crotch (*35*) stated that *Lyctus* F. is heterogenous and has no type. Tournier (*177*) presented a key to 7 species occurring in Europe. Redtenbacher (*146*) believed that *Lyctus* F. should be in the family Cryptophagidae. Seidlitz (*160*) placed *Lyctus* F. in the family Cucujidae.

In 1877 Kiesenwetter (*86*) categorized the genus *Lyctus* F. in the group Lyctini, subfamily Bostrychini, family Anobiidae. He commented that the Lyctini might be of family rank. Reitter (*148*) congregated a number of genera in the family Lyctidae. He included *Lyctus* F., *Trogoxylon* LeC., *Lyctoxylon* Reitt., and *Lyctopholis* Reitt. LeConte and Horn (*96*) placed the subfamily Lyctinae in the Ptinidae. They distinguished the Lyctinae from the Bostrychinae by the former having the "first ventral segment elongated." Henshaw (*76*) in his list of Coleoptera of America put 7 species—4 *Lyctus* and 3 *Trogoxylon*—under the Ptinidae. Des Gozis (*40*) believed that *Lyctus* F. should be applied to *Rhizophagus* Hbst. and that *Xylotrogus* Steph. become the generic name

in place of *Lyctus* F. Casey (*26*) described *Lyctus parvulus* under the family Ptinidae, then in the appendix placed the genus in the family Cucujidae. Waterhouse (*186*) discussed the synonymy of *Ditoma rugicollis* Wlk. and *Minthea similata* Pasc., and remarked that though *Minthea* Pasc. had originally been placed in the family Colydiidae, it was related to the genus *Lyctus* F., which he considered belonged to the family Cioidae. Lesne in 1896 divided the Bostrychidae into 4 tribes without including the lyctids. Seidlitz (*163*) considered the Lyctinae as a subfamily of the Bostrychidae. Everts (*46*) listed *Lyctus* F. and *Lyctopholis* Reitt. under the family Lyctidae.

Ganglbauer (*62*) continued to give the Lyctidae family rank, under the suborder Polyphaga, superfamily Diversicornia. Reitter (*79*) supported the family rank of Lyctidae, and placed it immediately after the Bostrychidae and before the Ptinidae and Anobiidae. Blatchley (*17*) included the 4 species from Indiana under the genus *Lyctus* F., subfamily Lyctinae, family Bostrychidae. Kraus (*89*) considered the family Lyctidae valid. He believed that the lyctids are closely allied to the bostrychids, and concurred with Reitter's (*79*) classification. Kraus placed the genus *Trogoxylon* LeC. within the genus *Lyctus* F., though he did state that it might be of subgeneric rank. Sharp and Muir (*165*) in their discussion of the male genitalia maintained that the Lyctidae are separate from the Bostrychidae. They believed that the lyctids might be allied to the colydiids. They also remarked that the male genitalia of *Lyctus* F. appear very different from the male genitalia of the bostrychid genus *Apate* Redt.

Leng (*98*) listed the family Lyctidae with 2 groups, Lyctini and Bergini (for the genus *Berginus* Er.). He included 4 genera and 17 species. Lesne (*117*) believed *Trogoxylon* LeC. was distinct, and erected the tribe Trogoxylini. Lesne (*119*) was not convinced by Sharp and Muir's argument that the male genitalia of the lyctids differ from those of the bostrychids. He considered the Lyctitae [sic] a subfamily of the Bostrychidae. He in turn divided the subfamily Lyctitae into 2 tribes, Lyctini and Trogoxylini. Under Lyctini he included *Lyctus* F., *Minthea* Pasc., and *Acantholyctus* Lesne. Under the Trogoxylini he placed *Trogoxylon* LeC., *Lyctopsis* Lesne, and *Lyctoderma* Lesne.

Bradley (*21*) divided the family Lyctidae into 2 tribes, the Lyctini and the Bergini. Böving and Craighead (*20*) separated the larval lyctids from the bostrychids and other Bostrychoidea on the basis of size of the last abdominal spiracle in comparison with other abdominal spiracles. Gardner (*63*) discussed the biology of certain species of the subfamily Lyctinae. Poll (*145*) placed the family Lyctidae among the Terediles. Lesne (*129*) cataloged the subfamily Lyctinae under the family Bostrychidae. He listed 12 genera and 63 species. Anderson (*4*) in his larval studies apparently considered the Lyctidae close to but separate from the Bostrychidae. The 10th abdominal segment of lyctid larvae lacks the longitudinal groove and folds in front of the anus, which are present in bostrychid larvae. In addition, the 8th ab-

dominal spiracle of the Lyctidae is comparatively huge, whereas in the bostrychids it is not larger than the other abdominal spiracles.

Blackwelder (*14*) listed 19 species among 5 genera under the family Lyctidae. Vrydagh (*179, 180*) discussed the African species of Lyctinae. Crowson (*36*) considered the Lyctidae of family rank, and placed it with the Bostrychidae, Anobiidae, and Ptinidae in the superfamily Bostrychoidea. Arnett (*5*) gave the Lyctidae family rank, but doubted the validity of the generic position for *Trogoxylon* LeC.

Biology

The Lyctidae, commonly known as powder-post beetles, are so designated because of the propensity of the larvae to reduce sapwood, particularly of hardwoods, into a powdery frass.

The study of the biology of the various species of lyctids is far from complete. Alston (*1, 2*), Fisher (*53*), Kojima (*88*), Parkin (*140*), and Snyder (*168*) have largely contributed to the present knowledge of their biology. As this study is primarily taxonomic, biological studies were not attempted, though specimens were secured by rearing.

The following biological information is presented as compositely as possible, considering the paucity of comprehensive life-history studies. Xambeu (*191*) and Bureau (*24*) studied (*Lyctus canaliculatus* F.) =*linearis* (Goeze), with emphasis on mating and oviposition. Snyder (*168*) discussed the egg and manner of oviposition of *planicollis* LeC. Alston (*1, 2*) reported on *brunneus* (Steph.). Kojima (*88*) studied *linearis*. Gardner (*63*) described the larvae of *africanus* Lesne, *brunneus, Lyctoxylon japonum* Reitt., *Minthea rugicollis* (Wlk.), and *Trogoxylon auriculatum* Lesne. Parkin (*140*) reported on the work of the Forest Products Research Laboratory, which dealt primarily with *Lyctus brunneus*, though *linearis, planicollis, parallelopipedus* Melsh., *cavicollis* LeC., and *sinensis* Lesne were reared and observed. Beeson and Bhatia (*9*) discussed the biology of *Lyctus africanus, brunneus, malayanus* Lesne, *M. rugicollis, T. auriculatum, spinifrons* Lesne, *Lyctoxylon japonum, convictor* Lesne, *beesonianum* Lesne, and *Lyctoderma ambiguum* Lesne.

Life History and Habits

Adult lyctids are sexually mature upon emergence. Copulation occurs soon afterward, more often crepuscularly or nocturnally than diurnally.

Oviposition takes place 2 to 3 days after mating, usually nocturnally (Alston *2*). The female may feed on the surface of the wood by gnawing the torn fibers, possibly to detect the suitability of the timber for oviposition in relation to food value for the larvae. The egg-laying period usually lasts from 1 to 2 weeks, with most of the eggs being laid within the first 7 to 8 days of the female's life.

The female extends the long, flexible ovipositor directly into the lumen of the vessel, tracheae, or pores of the wood. The eggs are

laid at depths of from 1 to 3 mm. by *Lyctus parallelopipedus* and from 4 to 7.5 mm. by *planicollis* (Christian *31*). Those woods in which the vessels are most numerous are more liable to heavy attack. Before the ovipositor is actually inserted into a vessel, a preliminary examination of the surface is made with the ventral pygidial palps. After a vessel is selected, the ovipositor is slowly inserted. Apparently a further examination is made within the vessel by the vaginal palps on the apex of the ovipositor. If conditions are suitable, one or more eggs are deposited longitudinally in the vessel. If more than one is deposited, the eggs are placed in juxtaposition, the anterior pole of one adjacent to the posterior pole of the other (Alston *2*). The total number of eggs deposited may vary from 1 to 221. Kojima (*88*) reported an average of 15 to 20 for *linearis*. Parkin (*140*) reported 17 to 21 for *brunneus*.

The diameter of the vessels in which oviposition occurs is of great importance, as it must be large enough for insertion of the ovipositor, according to Parkin (*140*). For example, the average diameter of the ovipositor of *brunneus* is 0.078 mm., with a minimum of 0.056 mm.; therefore timber to be attacked must have an abundance of vessels with a diameter of 0.056 mm. or greater. The average diameter of the ovipositor of *linearis* is 0.083 mm. and of *planicollis* 0.076 mm. The egg is never deposited in cracks or in polished, waxed, varnished, or painted surfaces.

The egg is translucent white and cylindrical, with rounded ends. Eggs of *brunneus* average 0.8 mm. to 1.25 mm. in length and 0.15 mm. to 0.175 mm. in width, according to Alston (*2*). Parkin (*140*) gave 1 mm. as an average length for the eggs of this species. He further stated that the eggs of *brunneus*, *linearis*, *planicollis*, and *sinensis* are similar. The egg bears a threadlike process at the anterior end.

Parkin (*140*) found the incubation period was approximately 8 to 12 days; however, at 26° C. Christian (*31*) found it to be 6 to 7 days, whereas at 15° it was 19 to 20 days. Snyder (*168*) stated that when the *planicollis* larva is ready to emerge from the egg, it ruptures the posterior end of the shell and works itself backward through the opening. Alston (*2*) reported *brunneus* feeding on the egg yolk present in the anterior end and emerging forward. When free of the egg shell, the young larva is facing the pore opening in which the female has inserted her ovipositor. Feeding on the ventral wall occurs in this direction for a distance of about 1 or 2 mm. The young larva then eats through the vessel wall at a right angle for 1 or 2 mm., after which the original course is reversed, the young larva tunneling away from the point of entrance of the mother's ovipositor.

The larva on hatching is white and straight bodied, armed caudally with a pair of small spines. *L. linearis* is approximately 0.6 mm. long and 0.2 mm. wide (Kojima *88*); *brunneus* is about 0.65 mm. long (Tooke *176*). After the first molt, the larva assumes a curved form. The young larva usually tunnels with the grain of the wood. In the later stages the larval tunnel takes an irregular course, often recrossing its earlier track or intersecting the tunnels

of other larvae. Tunnels approaching the surface of infested wood do not penetrate it but leave a thin, unbroken skin. The larva continues to excavate the tunnels, and grows chiefly during the spring and summer. It is usually dormant during the winter. In heated rooms it will continue to develop during cool weather (Tooke *176*).

A mature larva is variable in size, usually less than 5 mm. in length. The body is small, curved, and enlarged at the thorax. The antennae are 3-segmented, with an accessory appendage. The labial palps are 1-segmented. The mandibles have a pseudomola. The abdomen bears 8 spiracles, the spiracle of the eighth abdominal segment being oval and 6 times as large as the others. The legs are distinct and 3-segmented, the prothoracic pair usually stouter than the other 2 (Gardner *63*). The larva may remain in the wood for about 10 months, the length of time varying with the temperature, moisture, and condition of the wood. When fully matured it bores its way near the surface of the wood and builds a pupal chamber (Tooke *176*).

The pupa is at first white but gradually darkens in color, is free, and shows the external features of the adult (Gahan *60*). The pupal period lasts approximately 12 days to 1 month (Tooke *176*), though this again is variable, depending on the environment. When the transformation from pupa to imago occurs, the beetle cuts its way to the surface. When emerging it generally pushes some of the fine dust in front of it, and as a result small piles of dust can often be seen near new holes. These emergence or flight holes are about 2 or 3 mm. in diameter. Sometimes where the beetle has no other means of emerging, the holes may be bored through heartwood, softwood, asbestos, lead sheeting, or plaster, according to Tooke (*176*).

The same author stated that under conditions of normal temperature and humidity the complete cycle from egg laying to emergence of the adult beetle takes from 9 to 12 months. Under exceptionally favorable conditions, such as high temperature and humidity and high starch content of the wood, the life cycle may take from 7 to 8 months. The shortest period observed was 76 days in pecan sapwood for *parallelopipedus* (Christian *31*). Two generations a year are not uncommon in the Southern United States. Beeson and Bhatia (*9*) reported up to 3 generations per year for *africanus* in India. Under adverse conditions the life cycle may take from 2½ to 4 years or longer.

During daylight the beetles conceal themselves in cracks and holes in the wood, but become active at dusk. They fly readily and are positively phototropic. The length of life of the *brunneus* female averages about 6 weeks; the male is shorter lived, surviving only 2 to 3 weeks (Alston *2*). According to Parkin (*140*), there is little difference in length of survival between the 2 sexes of *brunneus*. Kojima (*88*) reported a maximum of 23 days for a female and 32 days for a male *linearis*.

The larva feeds mainly on the sapwood of hardwoods. Lyctids are polyphagous. Beeson and Bhatia (*9*) recorded 85 food plants

for *africanus*. Tooke (*176*) stated that the chief source of food of the larva is the starch in the cell content of the wood. The cell wall is not digested. Besides starch, certain sugars, disaccharides, and a polysaccharide, as well as protein, are necessary constituents of the larval food. The larva is unable to digest cellulose and hemicellulose. The relative proportions of cellulose, pentosans, and lignin in sapwood are not changed during the passage of the wood particle through the intestines of the insect. As the presence of starch in sapwood is essential for infestation to occur, the greater the starch content, the greater the possible extent of damage. Below a minimum concentration of starch no attack occurs. Moisture is also essential for the normal development of the larva. It will thrive in wood with a moisture content of between 8 and 30 percent. The higher the moisture content, the more favorable to larval growth. Tooke (*176*) reported that wood with a moisture content of less than 8 percent is not attacked. Christian (*31*) stated that *planicollis* would attack wood with a moisture content of 6 to 32 percent.

Predators and Parasites

Predators and parasites are not a factor in the artificial control of the lyctid beetles (Snyder *169*, Vrydagh *178*). They are mentioned here merely to complete the biology of this group.

Rohwer (*in* Snyder *169*) stated that a braconid, *Heeabolus lycti* Cress., is the predominating parasite of *planicollis*. Snyder (*169*) reported a clerid predator, *Tarsostenus univittatus* Rossi, on *planicollis*. Gahan (*60*) listed the braconid *Eubadizon pallidipes* Nees as a parasite of *linearis* and *brunneus*, the braconid *Monolexis lycti* (Cress.) from *parallelopipedus* and *planicollis*, and the bethylids *Sclerodermus domesticus* Latr. and *macrogaster* Ashm. from *brunneus* and *parallelopipedus*. He also mentioned the braconids *Spathius exarator* L. and *pedestris* Westw. and *Heeabolus sulcatus* Curt. as attacking *Anobium*, *Ptilinus*, and *Lyctus*. Christian (*31*) added *Heterospilus* sp. and *Ecphylus* sp. to the list of wasps parasitic on lyctids. Vrydagh (*178*) reported *T. univittatus* as commonly attacking *brunneus* and *M. rugicollis*. Browne (*23*) found *rugicollis* parasitized by 4 Hymenoptera—*Monolexis* sp. (Braconidae), *Cephalonomia* and *Sclerodermus* spp. (Bethylidae), and *Cercocephala* sp. (Pteromalidae)—and the predaceous clerid *univittatus*. Lesne (*119*) reported that *africanus* was attacked by *univittatus*, *Denops ferrugineus* Boh., and *Tillus* sp. Lesne (*119*) and Vrydagh (*178*) reported a histerid predator, *Teretrius picipes* F., on *brunneus*. Kojima (*88*) compiled a number of references to lyctid enemies. He listed the chalcids *Perilampus micans* Westw. and *Eusandalum inerne* Ratz. from *Lyctus* sp. and the clerids *Tillus unifasciatus* F. and *Monophylla terminata* Say from *linearis*.

External Morphology

The family Lyctidae may be characterized as small, reddish-brown to black beetles, which are immaculate, elongate, and sub-

cylindrical, with a prominent, slightly deflected head constricted behind the eyes.

The head is usually declivous, depressed, or flattened dorsoventrally, and the vertex (*VER*)[6] is generally rugose, punctate, or smooth. The eyes are widely separated, laterally placed, prominent, and oval or rounded. The 11-segmented, claviform antennae (*AN*) are immediately anterior of the eyes, in the concavities (antacava) of the genae, ventrad of the frontal lobes (*FL*) (frontal ridge, supra-antennal tubercle, frontal angle) and lobes of postclypeus (*PCL*). The club of the antenna is 2-segmented, except in the genus *Cephalotoma* Lesne, which is 3-segmented. The postclypeus (*PC*) (epistoma) is separated from the front by a distinct suture formed by the epicranial arms, the epicranial suture (*ES*). The labrum (*LA*) is bilobed and fringed with long, silky hairs.

The mandibles are heavily chitinized, well developed, broad at the base usually, and bidentate at the apex of the inner margin. The outer margin often bears a patch or brush of thick setae.

The maxilla (*MAX*) is composed of a 4-segmented palpus, a fringed lacinia, and a 2-segmented galea, having a short basal segment and enlarged and elongated distal segment and bearing hairs or spines at the apical portion. The palpifer and stipes are somewhat elongated, the subgalea is broadly triangular, and the cardo is nondescript.

The labium is composed of a strongly chitinized, oblong mentum (*ME*), which is rounded apically and truncated caudad. The labial palpi are 3-segmented, and the distal segment is usually enlarged. The palpi are flanked by the membranous paraglossae, which bear a fringe of hairs on their inner margin. The glossa is sublanceolate, and covered with thick spines and hairs.

The pronotum is convex or slightly depressed, sometimes with a median depression, or a median fovea (*MF*). Posteriorly there may be a median canaliculation (*MC*). The anterior margin may be truncate, emarginate, or rounded. The anterior angles (*ANA*) may be prominent, acute, blunt, or obsolete. The posterior angles (*POA*) are usually toothed. The lateral margin may be smooth or denticulate. The pubescence may be fine, silky, coarse, curvate, or broadly clavate.

The prosternal (*PRO*) coxal cavities (*CO*) are rounded, closed behind, and separated, but may vary from contiguous to widely separated. The mesosternal (*MES*) and metasternal (*MET*) coxal cavities are each widely separated. The metasternal coxae are transverse and narrowly triangular in shape. The prothorax is somewhat flattened, and does not form a hood over the head. The legs are slender, the distal end of the prothoracic tibiae bearing a large spur on the inner margin (*ITS*) and sometimes a smaller spur on the outer margin (*OTS*). The metathoracic femora (*F*) may or may not be expanded. The tarsal formula is 5-5-5 (pentamerous), with the first segment very small and the fifth segment

[6] This and other abbreviations in this section refer to pl. I, 1–3.

almost as long as all the preceding segments combined. The tarsal claws are simple.

The elytra are uniform in shape, covered with irregularly placed punctations and hairs, regularly placed punctations and hairs, or combinations of the two. The hairs may be fine, silky, arcuate, or broadly clavate. The hairs may be arranged in rows on ridges called carinulae, and the area between the carinulae, the interspace (*IN*), may have 1, 2, or more rows of punctations.

The wings of the Lyctidae closely resemble those of *Dinoderus* of the family Bostrychidae. According to Forbes (*56*), the wing-folding pattern is that of the superfamily Bostrychoidea. The lyctids differ by having a free anal lobe. The venation is reduced.

The abdomen is composed of 5 visible sternites—morphologically sternites 3 to 7, taxonomically sternites 1 to 5. The taxonomic system of numbering will be followed. The first sternite is almost as long as the next 2 combined. The eighth sternite (morphologic) is often extruded and visible.

The morphology of the male genitalia has been discussed by Sharp and Muir (*165*) and Alston (*2*). The external genitalia (pl. I, 3) consist of a cutlass-shaped penis (*PEN*), or median lobe, encased on each side by sclerotized parameres (*PAR*), or lateral lobes. The parameres are joined ventrally and unite again behind the point of articulation of the penis. The basal portion is completely enwrapped by the basal plate (*BP*), or basal piece. The distal end of the parameres evidently bears sensory pits and sensory hairs.

The male genitalia of all available species were dissected and mounted, and the penis and parameres figured. The only previous illustrations of the male genitalia of any of the lyctids are those of *Lyctus linearis* by Sharp and Muir (*165*) and Kojima (*88*), of *brunneus* by Alston (*2*), and of *linearis* and *Lyctoderma testaceum* Lesne by Lesne (*121*).

Unfortunately male genitalic characters of this group do not lend themselves readily to the use of a key. Differences between genera and between species are so subtle that they can best be described by illustrations.

The morphology of the female genitalia has been discussed by Alston (*2*) and Kojima (*88*). The external genitalia consist of the muscled ovipositor, sclerotized rods, and 2 basal pieces bearing 2 segmented vaginal palpi. The vaginal palpi bear sensory pits and setae. Though dissections were made of females of most species, the female genitalia did not appear to have sufficient taxonomic characters to be of value.

Economic Importance and Control Measures

The destructiveness of lyctid beetles to wood and wood products is second only to that of termites. The annual loss of lumber and wood products in the United States due to lyctid beetles is approximately $17,600,000 (Hyslop *82*). The worldwide loss is considerably higher.

As noted previously, lyctid larvae primarily attack the sapwood of hardwoods. They are more often found in rather recently dried wood than in old wood. They attack lumber that is used for hardwood floors, crating, furniture, implement handles, spokes for wheels, and gunstocks.

The damage consists of the destruction of the wood, resulting in a powdery frass as the larvae tunnel their way through the sapwood. When the adult beetles emerge, they further damage the wood by producing exit or flight holes 2 to 3 mm. in diameter.

The control of the lyctids has been discussed by Snyder (*169*), Vrydagh (*178*), Gahan (*60*), and Tooke (*176*), and is briefly summarized here.

Heat treatment is satisfactory under certain conditions. Dry heat that will raise the temperature of the wood to 120°–149° F. for 2 hours will kill all stages of lyctids, but may alter the physical properties of the wood. Moist heat is effective; however, the temperature of the kiln, relative humidity, thickness of the lumber, and exposure time must be considered. For example, ash sapwood 1 inch thick that is exposed to a kiln temperature of 130° at 100-percent relative humidity would require an exposure of 2½ hours after the kiln has attained the required conditions (Snyder *169*).

The treatment of wood to reduce the starch content has been investigated. As Vrydagh (*178*) pointed out, a practical, economical method is not yet available. Chemical treatment appears to be the most feasible at the moment. There are many wood preservatives that have been and are being used. Coal-tar distillates, such as creosotes, have been used extensively. Pentachlorophenol is replacing creosote to some extent. Copper or zinc naphthenate, orthodichlorobenzene, and various water-soluble metallic salts have been used as preservatives. Some of the chlorinated hydrocarbons, such as benzene hexachloride and chlordane, have been investigated, and show great promise as a preventive as well as a cure. Good lumberyard sanitation is one of the greatest aids in reducing damage.

Distribution

The family Lyctidae is worldwide in distribution, each region having an indigenous fauna plus established introduced species. The family is predominantly a tropical and temperate group. Its distribution is as follows:

Genus	*Region*
Acantholyctus Lesne	Ethiopian, southern palaearctic
Cephalotoma Lesne	Australian, Ethiopian, oriental
Lycthoplites Lesne	Ethiopian
Lyctoderma Lesne	Ethiopian, oriental
Lyctodon Lesne	Australian
Lyctopsis Lesne	Ethiopian
Lyctoxylon Reitt	Eastern palaearctic, oriental
Minthea Pasc	Australian, Ethiopian, neotropical, oriental, tropicopolitan
Phyllyctus Lesne	Neotropical
Tristaria Reitt	Australian

Lyctus F. and *Trogoxylon* LeC. occur in all the faunal regions.

Because of the facility of introduction and establishment of these insects, distribution records are primarily of economic rather than taxonomic interest.

Key to Genera of Lyctidae of the World

1. Metathoracic femur slender, not ellipsoidal or subglobose; punctations and pubescence of elytra seriated, impressed (Lyctini) 2
   Metathoracic femur compressed, subglobose, or ellipsoidal; pubescence of elytra diffused, nonseriated (Trogoxylini) 7

2. Vertex with 1 or 2 median tubercles 3
   Vertex without median tubercles 5

3. Vertex with 2 median tubercles ..... *Lyctodon*[7] Lesne
   Vertex with 1 median tubercle 4

4. Mentum rounded or arcuate ..... *Lycthoplites*[7] Lesne
   Mentum angled on median line ..... *Acantholyctus*[7] Lesne

5. Antennal club with terminal segment ovoid becoming attenuated toward apex, usually longer than penultimate segment; dorsal pubescence composed of fine, appressed, or thick, curvate hairs ..... *Lyctus* F.
   Antennal club with 1 or both segments greatly elongated; dorsal pubescence of erect hairs or semierect, thick hairs 6

6. Antennal club with both segments elongated, both segments longer than broad, terminal segment narrower than penultimate segment; head with group of thickened, erect hairs over eye and side margins of frontal lobe and postclypeal lobe; dorsal pubescence composed of thick, semierect hairs not in regular rows ..... *Lyctoxylon* Reitt.
   Antennal club with terminal segment elongated; segments of funicle clothed with semierect, squamous hairs; elytra distinctly striated with wide, flattened, erect, scalelike hairs ..... *Minthea* Pasc.

7. Pronotum with lateral margins not grooved; base of mandibles without leaflike expansion 8
   Pronotum with lateral margins reflexed and grooved; base of mandibles expanded, leaflike 11

8. Apex of prosternal lobe not so wide as coxal cavity .... *Trogoxylon* LeC.
   Apex of prosternal lobe as wide or wider than coxal cavity 9

9. Frontal lobe and lateral lobe of postclypeus separated by incision; penultimate segment of antennal club always longer than apical segment ..... *Lyctopsis*[7] Lesne
   Frontal lobe and lateral lobe of postclypeus coalescent; penultimate segment of antennal club shorter than apical segment, if longer then narrower; body strongly flattened 10

10. Mentum truncated in front; apical segment of antenna longer and wider than penultimate; pronotum covered with short, recumbent hairs .... *Tristaria*[7] Reitt.
    Mentum lobed; apical segment of antenna short and narrower than penultimate; pronotum covered with extremely short, erect hairs .... *Phyllyct's* Lesne

11. Antennal club of 2 segments; pubescence of pronotum recur[illegible]; body shiny beneath ..... *Lyctodes*[7] Lesne
    Antennal club of 3 segments; pronotum with short, erect hairs; body dull beneath ..... *Cephalotoma*[7] Lesne

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[7] Not reported from the New World.

Checklist of Lyctidae of the World

LYCTINI Lesne, 1921.

Lyctus Fabricius, 1792.

1. *africanus*[8] Lesne, 1907.
   politus Kraus, 1911.
1a. *africanus capensis* Lesne, 1914.
1b. *africanus nigellus* Lesne, 1935.
2. *brunneus*[8] (Steph.), 1830.
   parasiticus Steph., 1829.
   colydioides Dej., 1837.
   glycyrrhizae Chev., 1844.
   disputans Wlk., 1858.
   retrahens Wlk., 1858.
   rugulosus Montr., 1861.
   jatrophae Woll., 1867.
   costatus Blackb., 1888.
   carolinae Csy., 1891.
3. *caribeanus*[8] Lesne, 1931.
4. *cavicollis*[8] LeC., 1866.
5. *chilensis*,[8] n. sp.
6. *cinereus*[8] Blanch., 1851.
   nitidicollis Reitt., 1878.
7. *discedens* Blackb., 1888.
8. *fursovi* Gerberg, (nomen novum).
   turkestanicus Fursov, 1939, (not Lesne, 1935).
   (This name is a primary homonym of *turkestanicus* Lesne, 1935. Therefore, I have proposed the new name.)
9. *hipposideros* Lesne, 1908.
10. *linearis*[8] (Goeze), 1777.
    ?fusca L., 1767.
    unipunctatus Hbst., 1783.
    oblongus Geoff., 1785.
    canaliculatus F., 1792.
    pubescens Duft., 1825.
    axillaris Melsh., 1844.
    striatus Melsh., 1844.
    duftschmidi Des Gozis, 1881.
10a. *linearis crassicollis* Lesne, 1916.
11. *longicornis*[8] Reitt., 1878.
12. *malayanus* Lesne, 1910.
13. *opaculus*[8] LeC., 1866.
    brevipennis Csy., 1924, (new synonymy).
14. *parallelocollis* Blackb., 1888.
15. *parvulus*[8] Csy., 1884.
16. *planicollis*[8] LeC., 1858.
    ?carbonarius Waltl, 1832.
16a. *planicollis leacocianus*[8] Woll., 1860.
16b. *planicollis modestus*[8] Lesne, 1911.
17. *praeustum*[8] Er., 1847.
18. *pubescens* Panz., 1793.
    bicolor Com., 1837.
    caucasicus Tour., 1874.
19. *shestakovi* Fursov, 1939.
20. *simplex*[8] Reitt., 1878.
21. *sinensis* Lesne, 1911.
22. *suturalis* Fald., 1837.
    deyrollei Tour., 1874.
23. *tomentosus*[8] Reitt., 1878.
    griseus Gorh., 1883.
24. *turkestanicus* Lesne, 1935.
25. *villosus*[8] Lesne, 1911.

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[8] Reported from the New World.

LYCTINI Lesne, 1921.—Continued.

Acantholyctus Lesne, 1924.

1. *cornifrons* Lesne, 1898.
1a. *cornifrons australis* Lesne, 1914.
2. *semiermis* Lesne, 1914.

Lyctodon Lesne, 1937.

1. *bostrychoides* Lesne, 1937.

Lycthoplites Lesne, 1935.

1. *armatus* Lesne, 1935.

Minthea Pascoe, 1866.

1. *apicata* Lesne, 1935.
2. *bivestita* Lesne, 1937.
3. *humericosta* Lesne, 1936.
4. *obstita*[S] (Woll.), 1867.
5. *reticulata*[S] Lesne, 1931.
6. *rugicollis*[S] (Wlk.), 1858.
   similata Pasc., 1866.
   fovicollis Reitt., 1878.
   hispida Blackb., 1885.
7. *squamigera*[S] Pasc., 1866.
   stichothrix (Reitt.), 1878.

Lyctoxylon Reitter, 1878.

1. *beesonianum* Lesne, 1936.
2. *convictor* Lesne, 1936.
3. *dentatum* (Pasc.), 1866.
4. *japonum*[S] Reitt., 1878.
   serichispidum Kiesen., 1879.

TROGOXYLINI Lesne, 1921.

Trogoxylon LeConte, 1861.

1. *aequale*[S] (Woll.), 1867.
   californicum Csy., 1891, (new synonymy).
   curtulum Csy., 1891.
2. *auriculatum* Lesne, 1932.
3. *caseyi*[S] Lesne, 1937.
   rectangulum Csy., 1924, (not Lesne, 1921).
4. *impressum*[S] (Com.), 1837.
   castaneus Perr., 1837.
   glabratus Villa, 1837.
   laevipennis Fald., 1837.
   laevis Galeazzi, 1854.

4a. *impressum capitalis* Schauf., 1879.

5. *parallelopipedum*[S] (Melsh.), 1844.
6. *prostomoides*[S] (Gorh.), 1883.
7. *punctatum*[S] LeC., 1866.
8. *punctipenne*[S] (Fauv.), 1904.
9. *rectangulum*[S] Lesne, 1921.
10. *recticolle*[S] Reitt., 1878.
11. *spinifrons* (Lesne), 1910.
12. *ypsilon* Lesne, 1937.

Tristaria Reitter, 1878.

1. *grouvellei* Reitt., 1878.
   fulvipes Reitt., 1878.
   labralis Blackb., 1892.

Lyctopsis Lesne, 1911.

1. *inquilina* Lesne, 1932.
2. *pachymera* Lesne, 1911.
3. *scabricollis* Lesne, 1911.

TROGOXYLINI Lesne, 1921.—Continued.

Lyctoderma Lesne, 1911.

1. *africanum* (Grouv.), 1900.
2. *ambignum* Lesne, 1936.
3. *coomani* Lesne, 1932.
4. *testaceum* Lesne, 1913.

Cephalotoma Lesne, 1911.

1. *perdepressa* Lesne, 1937.
2. *singularis* Lesne, 1911.
3. *tonkinea* Lesne, 1932.

Phyllyctus Lesne, 1911.

1. *gounelle*[8] (Grouv.), 1896.

Genus *Lyctus* Fabricius[9]

Lyctus Fabricius, 1792, Ent. Systematica, v. 1, p. 502; Paykull, 1800, Fauna Suecica, v. 3, p. 326; Fabricius, 1801, Systema Eleutheratorum, v. 2, p. 562; Latreille, 1804, Hist. Nat. Crust. et Ins., v. 11, p. 241; 1807, Genera Crust. et Ins., v. 3, p. 16; Gyllenhal, 1813, Ins. Suecica, v. 1, pt. 3, p. 408; Stephens, 1830, Illus. Brit. Ent., Mandibulata, v. 3, p. 117; Shuckard, 1839, Elements of Brit. Ent., v. 1, p. 188; Blanchard, 1845, Hist. des Ins., v. 2, p. 93; Redtenbacher, 1849, Fauna Austriaca, Käfer, p. 188; Bach, 1851, Käferfauna für Nord und Mitteldeutschland, v. 1, p. 246; Wollaston, 1854, Ins. Maderensia, p. 151; Lacordaire, 1857, Hist. Nat. Ins., Genera Coléopt., v. 4, p. 547; Jacquelin-duVal, 1859–63, Genera Coléopt. Europe, v. 3, pp. 234–235, pl. 57, fig. 283; LeConte, 1861, Smithsn. Inst. Misc. Collect. 3, art. III, pt. 1, p. 209; Thomson, 1863, Skandinaviens Coleopt., v. 5, p. 204; Redtenbacher, 1874, Fauna Austriaca, Käfer, (ed. 3), v. 1, p. 391; Kiesenwetter, 1877, *in* Erichson, Naturgesch. Ins. Deut., Coleopt., v. 5, pt. 1, pp. 11–18; Reitter, 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 195–198; 1879, ibid. 29: 98; 1855. Best.-Tab. Europ. Coleopt. (ed. 2), v. 1, p. 42; Des Gozis, 1886, Rech. de l'Esp. Typ., p. 11; Marchal, 1888, Feuille Jeunes Nat. 208: 50; Casey, 1890, N. Y. Acad. Sci. Ann. 5: 324; 1891, ibid. 6: 12; Seidlitz, 1891, Fauna Baltica, Käfer, (ed. 2), pp. 56, 234; 1891, Fauna Transsylvanica, Käfer, pp. 56, 249; Everts, 1899, Coleopt. Neerlandica, v. 1, pt. 2, p. 565; Schilsky, 1899, *in* Küster and Kraatz, Käfer Europas 36: CCC; Blatchley, 1910, Ind. Dept. Geol. and Nat. Resources Bul. 1, pp. 891–892; Reitter, 1911, Fauna Germanica, v. 3, pp. 96–97; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 115–116; Jacobson, 1913, Käfer Russlands, v. 2, p. 895; Kalshoven, 1923, Tectona 16: 731; Lesne, 1924, *in* Encyclopédie Ent. III, pp. 79–80; Froggatt, 1927, Forest Ins. and Timber Borers, p. 68; Leonard, 1928, N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, p. 416; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, pp. 6–12; Brimley, 1938, Ins. of N. C., p. 198; Gahan, 1946, Brit. Mus. Nat. Hist. Econ. Ser. 2, pp. 15–19; Arnett, 1952, U. S. Bur. Ent. and Plant Quar. E-844, pp. 1–4.

Xylotrogus Stephens, 1830, Illus. Brit. Ent., Mandibulata, v. 3, p. 117; Shuckard, 1839, Elements of Brit. Ent., v. 1, p. 187; Reitter, 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 195; LeConte and Horn, 1883, Smithsn. Inst. Misc. Collect. 26, art. IV, p. 229; Reitter, 1911, Fauna Germanica, v. 3, p. 96; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 117–118; Jacobson, 1913, Käfer Russlands, v. 2, p. 896.

Eulyctus Jacobson, 1913, Käfer Russlands, v. 2, p. 896, (not seen).

Head slightly declivous, completely visible from above, usually narrower than pronotum; vertex punctate and pubescent; pubescence of fine, silky, recumbent hairs or thick, curvate hairs; vertex sloping to epicranial suture; frontal ridge depressed, level, or elevated; postclypeus usually curved, depressed, level, or elevated, contiguous to frontal ridge or separated by V-shaped notch; labrum emarginate, obcordate, or retuse; mandibles promi-

[9] Lyctus, Λυκτος, a city of Crete east of Gnossus, a colony of the Lacedaemonians.

nent, bidentate apically, usually with patch of setae on outer margin; antennae 11-segmented, clavate, approximately length of pronotum; first and second segments enlarged, third to ninth segments smaller, last 2 segments forming club, which is shorter than funicle.

Thorax quadrate, rectangular, rounded, or suboctagonal; pronotum moderately convex, punctate, pubescent; disk convex, impressed, or foveate; inner tibial spur of prothoracic leg prominent; tarsi 5-segmented, first segment small, hidden, fifth segment long; tarsal formula 5-5-5.

Elytra convex, approximately twice as long as wide, striated, with single or double rows of punctations separated by rows of hairs on carinulae.

Abdomen faintly punctate; first sternite long, remaining 4 much smaller in size, fifth sternite rounded or subtriangular.

Type species.—Of *Lyctus*, *L. canaliculatus* F. (designated by Blanchard 1845); of *Xylotrogus*, *X. brunneus* Steph. (monobasic).

This genus contains 25 described species, which are distributed throughout the world. Fourteen species have been reported from the New World.

Key to New World Species of *Lyctus*[10]

1. Thorax and elytra with fine, recumbent hairs 2
   Thorax and elytra with long, coarse, curvate hairs 10
2. Elytral interspace with 1 or more but not 2 rows of punctations 3
   Elytral interspace with 2 rows of punctations 6
3. Pronotum with deep, broad, longitudinal median fovea 4
   Pronotum convex, at most shallow impression 5
4. Punctations of pronotum rugose, reticulated ..... *linearis* (Goeze)
   Punctations of pronotum distinctly separated ..... *chilensis*, n. sp.
5. Distinct notch between frontal lobe and postclypeal lobe; lateral margin appearing bituberculate; sides of pronotum subsinuate, narrowing posteriorly; female without heavy fringe of silky hairs on fourth abdominal sternite ..... *brunneus* (Steph.)
   Frontal and postclypeal lobes contiguous and continuous; no distinct notch between them; sides of pronotum subparallel; female with thick fringe of hairs on fourth abdominal sternite ..... *africanus* Lesne
6. Pronotum as broad or broader than long; posterior angles distinct ... 7
   Pronotum longer than broad, subelliptical; anterior and posterior angles obsolete ..... *opaculus* LeC.
7. Pronotum shiny, punctations shallow, distinctly separated; recumbent hairs on pronotum fine, silky 8
   Pronotum rugose, reticulopunctate, dull; recumbent hairs on pronotum thick ..... *parvulus* Csy.
8. Head narrower than pronotum, pronotum slightly broader than long, with deep, basal median canaliculation 9
   Head broader than pronotum, pronotum subquadrate, with small, shallow, basal median canaliculation ..... *cinereus* Blanch.
9. Antenna stout, club prominent, 10th segment wider than long; front coxae separated by one-half their width ..... *planicollis* LeC.
   Antenna slender, club weak, narrowly oval, 10th segment not wider than long; front coxae separated by one-fourth their width ... *cavicollis* LeC.
10. Pronotum distinctly narrower than base of elytra 11
    Pronotum almost as wide as base of elytra ..... *caribeanus* Lesne
11. Pronotum broader than long, with deep median fovea and 2 posterior lateral foveae; anterior margin rounded ..... *villosus* Lesne
    Pronotum longer than broad, slightly depressed medianly; anterior margin bisinuate, with toothed anterior angles ..... *simplex* Reitt.

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[10] Specimens of *L. longicorns* Reitt. and *tomentosus* Reitt. are unknown to the author, and the original descriptions are not sufficiently clear or detailed to include them in this key.

Lyctus africanus Lesne
(Pl. II, 1–8)

Lyctus africanus Lesne, 1907, Soc. Ent. de France Bul., p. 302; 1910, ibid., p. 254; 1914, Paris Mus. d'Hist. Nat. Bul. 20, p. 332; 1922, Voy. de Rothschild en Ethiope, v. 2, p. 652; 1924, *in* Encyclopédie Ent. III, pp. 81–89, fig. 49; 1925, *in* Encyclopédie Ent., Ser. B, Coleopt., v. 1, p. 32; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 7; Lepesme, 1944, *in* Encyclopédie Ent., Ser. A, xxii, p. 79, fig. 77; Basilewsky, 1952, Rev. de Zool. et de Bot. Africaines 46: 86–87.

Lyctus politus Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 118, 122; Lesne, 1914, Paris Mus. d'Hist. Nat. Bul. 20, p. 332.

Lyctus spinifrons Stebb. (not Lesne), 1914, Indian Forest Ins., p. 177, fig. 121.

L. africanus resembles *brunneus* (Steph.), from which it is differentiated by the contiguous, continuous, unelevated lateral lobes of the postclypeus and frontal lobes. The female can be distinguished by the heavy fringe of hairs on the distal margin of the fourth sternite, which is lacking in the latter species. *L. africanus* is smaller, on the average, than *brunneus*.

Head slightly declivous, narrower than pronotum; vertex evenly and densely punctate, punctations distinctly separated; lateral margin of vertex bordering eye slightly raised, forming shallow orbital ridge; frontal ridge neither depressed nor strongly elevated; vertex sloping gently to epicranial suture, postclypeus continuing slope of vertex; at lateral margin postclypeal and frontal lobes forming continuous line, at most slight indentation; labrum emarginate, lying in same plane as postclypeus; apical portion of head with mandibles forming isosceles triangle; outer margin of mandibles notched at middle; arcuate setae present from notch to base; antennae approximately length of pronotum; basal 2 segments enlarged, equal in length to segments 3 to 6, or to antennal club; penultimate segment of antennal club shorter and broader than last segment.

Thorax subquadrate; pronotum shiny, punctate, anterior-lateral portion declivous; anterior angle obtusely rounded; lateral margins denticulate, narrowing slightly posterior, and subsinuate; posterior angles acute; disk barely concave, punctations on disk separated by diameter of punctation; prothoracic coxal cavities widely separated; tibial spur on prothoracic leg prominent, larger than first 2 tarsal segments.

Elytra approximately 5 times length of thorax, slightly less than twice as long as wide, sides parallel; striae with single row of punctations, separated by carinulae bearing single row of fine, sparse hairs.

Abdomen not shiny, faintly punctate; female with heavy fringe of silky hairs on distal border of fourth sternite and median tuft on fifth sternite; males without such hirsute formations on fourth and fifth sternites.

Length 2.5 to 4 mm.

Type locality.—Of *africanus*, Africa; of *politus*, Washington, D. C., reared by F. H. Chittenden from licorice. The types of *africanus* are in the Museums of Paris and of Tervuren in Belgium. The type of *politus* is in the United States National Museum, No. 7432.

Distribution.—The species is apparently endemic in the oriental and Ethiopian regions. It does not appear to have become established in this country, and has been collected largely at ports of entry.

Material examined.—(64 specimens).

DISTRICT OF COLUMBIA: Washington, October 1898, reared from licorice; December 3, 1937, from Africa in baskets.
FLORIDA: Nocatee, April 9, 1935, (T. E. Snyder).

MARYLAND: Baltimore, from British India in racquets; Randallstown, February 17, 1954, in mahogany plywood, (E. N. Cory and E. J. Gerberg).
MASSACHUSETTS: Boston, from Freetown, Sierra Leone, in papaya seeds.
NEW YORK: New York (from Bureau of Entomology and Plant Quarantine inspections at port), October 14, 1936, from India in marshmallow roots; June 23, 1942, from India in ginger root; February 14, 1944, from India in licorice twigs; September 4, 1944, from India in wood.
OREGON: Portland, October 20, 1944, from New Guinea in grass skirts.
PENNSYLVANIA: Philadelphia, from Turkey in dry roots; October 14, 1936, from India in wooden cases.

Lyctus brunneus (Stephens)

(Pl. II, 9–16)

Lyctus parasiticus Steph., 1829, Systematic Cat. Brit. Ins., p. 94, (nomen nudum).
Xylotrogus brunneus Steph., 1830, Illus. Brit. Ent., Mandibulata, v. 3, pp. 116–117, pl. 18; Seidlitz, 1875, Fauna Baltica, Käfer, pp. 160–161.
Lyctus colydioides Dej., 1837, Cat. des Coléopt. (ed. 3, rev.), p. 338, (nomen nudum).
Lyctus glycyrrhizae Chev., 1844, *in* Guérin-Méneville, Icon. Règne Anim., p. 191, pl. 41, fig. 3; Gemminger and Harold, 1869, Cat. Coleopt., v. 6, p. 1795, (places species in synonymy).
Lyctus brunneus (Steph.) Wollaston, 1854, Ins. Maderensia, pp. 151–153, pl. 4, fig. 5; Tournier, 1874, Pet. Nouv. Ent. 6: 412; Kiesenwetter, 1877, *in* Erichson, Naturgesch. Ins. Deut., Coleopt., v. 5, pt. 1, p. 17; Reitter, 1879, Zool.-Bot. Gesell. Wien, Verhandl. 29: 99–100; Seidlitz, 1891, Fauna Baltica, Käfer, (ed. 2), p. 234; 1891, Fauna Transsylvanica, Käfer, p. 249; Everts, 1899, Coleopt. Neerlandica, v. 1, pt. 2, p. 565; Schilsky, 1899, *in* Küster and Kraatz, Käfer Europas, v. 36, p. 73; Fauvel, 1904, Rev. Franç. d'Ent. 22 (6): 155; Reitter, 1906, Cat. Coleopt. Europae, p. 423; Lesne, 1910, Soc. Ent. de France Bul., p. 255; Reitter, 1911, Fauna Germanica, v. 3, p. 97; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, p. 123; Jacobson, 1913, Käfer Russlands, v. 2, p. 896; Lesne, 1924, *in* Encyclopédie Ent. III, pp. 82–83; Parkin, 1934, Ann. Appl. Biol. 21 (3): 500; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, pp. 7–8; Lepesme, 1944, *in* Encyclopédie Ent., Ser. A, XXII, pp. 78–79, fig. 76.
Lyctus disputans Wlk., 1858, Ann. and Mag. Nat. Hist. (ser. 3) 2: 206; Lesne, 1910, Soc. Ent. de France Bul., p. 255.
Silvanus retrahens Wlk., 1858, Ann. and Mag. Nat. Hist. (ser. 3) 2: 206; Lesne, 1910, Soc. Ent. de France Bul., p. 255.
Lyctus rugulosus Montr., 1861, Soc. Ent. de France Ann. (ser. 4) 1: 266.
Lyctus jatrophae Woll., 1867, Coleopt. Hesperidum, p. 112; Lesne, 1909, Paris Mus. d'Hist. Nat. Bul. 15, p. 348, (places *jatrophae* in synonymy); 1910, Soc. Ent. de France Bul., p. 255.
Lyctus costatus Blackb., 1888, Roy. Soc. So. Austral. Trans. and Proc. 10: 265.
Lyctus carolinae Csy., 1891, N. Y. Acad. Sci. Ann. 6: 13–14.

This species resembles *africanus* Lesne, and can be distinguished from it by its generally larger size and the V-shaped notch between the postclypeal and upturned frontal lobes. The female does not have the heavy fringe of hairs on the fourth sternite, but has a spicule of hairs on the fifth sternite.

Head barely declivous, narrower than anterior portion of pronotum, subequal to posterior portion; vertex evenly and densely punctate; punctations distinctly separated; orbital ridge present; vertex sloping abruptly to epicranial suture, forming angle with postclypeus; frontal lobes elevated; lateral lobes of postclypeus upturned, forming distinct V-shaped indentation with frontal lobes; labrum retuse, sloping ventrally, forming angle with postclypeus; mandibles with truncated ledge, bearing curvate setae on outer margin; antennae approximately same length as pronotum; basal 2 segments enlarged, but shorter than combined segments 3 to 6, or antennal club; penultimate segment of club shorter and broader than last segment.

Pronotum subquadrate, heavy punctations resulting in dull appearance, rounded anteriorly to distinct but rounded anterior angles; anterior-lateral portion not strongly declivous; lateral margins finely denticulate, sinuate, and narrowing posteriorly; posterior angles sharp; disk with slight median depression, with 2 lateral arms forming Y; tibial spur on prothoracic leg prominent.

Elytra approximately 3 times length of thorax, approximately twice as long as wide, sides subparallel; interspace with single punctations, larger and more regular mesad; interspaces not all separated by longitudinal carinulae; 5 rows of punctations between carinula at elytral suture and next carinula toward outer margin; 2 rows of punctations separate it from next carinula, remaining punctations separated by carinulae; all carinulae bear single rows of fine, sparse hair; longitudinal rows of hairs also present between interspaces.

Abdomen dull, faintly punctate; female differing from male by presence of "spicule," or "pencil," of hairs on fifth sternite; males without tuft of hair on fifth sternite.

Length 2.2 to 7 mm.

Type locality.—Of *brunneus*, British Isles; type in the British Museum. Of *jatrophae*, San Antonio, Cape Verde, in decayed branch of *Jatropha curcas*. Of *carolinae*, South Carolina; type in the Casey collection in the United States National Museum.

Distribution.—This species has a cosmopolitan distribution, apparently establishing itself fairly readily. It may have been originally neotropical, but now seems to have invaded most of the faunal regions.

Material examined.—(79 specimens).

ALABAMA: Chickasaw, September 17, 1935, (Bard Lumber Co.), in oak.
CALIFORNIA: Berkeley, April 1940, (K. A. Salmon), from Japan in bamboo rakes; Los Angeles, May 10, 1935, (A. House), from Java; Santa Barbara, November 13, 1953, (G. Davis), from Japan in clothespins.
DISTRICT OF COLUMBIA: Washington, March 1, 1934, (N. Y. Gouldman), from Philippines on dry tree fern.
FLORIDA: Orlando, October 1940, (W. V. King), from magnolia lumber.
NEW JERSEY: Hoboken, April 24, 1946, from India in wooden box.
NEW YORK: Long Island City, October 27, 1932, (P. N. Bilhuber), in sapwood of English oak; New York, October 29, 1941, from England in elm wood.
WASHINGTON: Seattle, May 22, 1929, (J. P. Young), from Japan in staves from bales of Cycas leaves.
VENEZUELA: Caracas, October 23, 1928, (H. Pittier), in wood of *Phyllanthus salviaefolius*, *Triplaris felipensis*, *Caesalpinia coriaria*, and *Lonchocarpus crucisrubiense*.

Lyctus caribeanus Lesne
(Pl. III, 1–7)

Lyctus caribeanus Lesne, 1931, Paris Mus. d'Hist. Nat. Bul. (ser. 2) 3, pt. 1, p. 96, fig. 1; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 8; Lepesme, 1947, Faune de l'Empire Franç. VII: 198.

L. caribeanus can be distinguished from the other villose lyctids *villosus* Lesne and *simplex* Reitt. by the shape of the thorax, which is wider than long, and the formation of the hairs and striae on the elytra.

Head sharply declivous, narrower than pronotum; vertex densely villose; hairs broad, some tricristulate, curvate; punctations of vertex irregular, barely visible through dense covering of hairs; frontal lobe continuous with lateral lobes of postclypeus; postclypeus broadly curved; labrum emarginate; antennae shorter than pronotum; basal 2 segments enlarged, shorter than antennal club; third segment longer than fourth to ninth; ultimate segment of club 1½ times as long as penultimate and subequal in width.

Pronotum rectangular; anterior border arcuate emarginate; sides strongly denticulate, narrowing posteriorly with sharp posterior corners; disk of pronotum convex, reticular punctate; lateral margins somewhat flattened, covered with broad, ridged, curvate hairs; inner tibial spur curved and prominent, outer tibial spur small.

Elytra subparallel, approximately 2½ times as long as prothorax and twice as long as wide; striae composed of large orbicular punctations, separated by 2 types of hairs in regular rows; typical hirsute pattern as follows: Row of large, backward projecting, broad, tricristulate, curvate hairs intermingled with flatter, thinner hairs, followed by row of orbicular punctations, row of slightly smaller not so high curvate hairs, row of punctations, and finally row of larger hairs mixed with smaller hairs.

Abdomen dull, rugulose; segments 3 to 5 with long, silky hairs, lying parallel to long axis; no obvious secondary sexual characteristics.

Length 2 to 3.2 mm.

Type locality.—Species described from a series from Central America and the Antilles. Lesne (*129*) in his original description lists a number of countries, including Mexico, Guatemala, Panama, Santo Domingo, Puerto Rico, and Guadeloupe. Type located in Museum of Natural History, Paris, France.

Distribution.—*L. caribeanus* is apparently a neotropical species, occurring mainly in the Central American and Caribbean region.

Material examined.—(13 specimens).

NEW YORK: New York, December 6, 1937, from Puerto Rico in kola root.
PANAMA: Frijoles, January 1922, (J. Zetek), in dead wood of avocado.
PUERTO RICO: Coamo, February 27, 1924, (G. N. Wolcott), from leguminous tree; Rio Piedras, May 8, 1921, (G. N. Wolcott).

Lyctus cavicollis LeConte

(Pl. III, 8–13)

Lyctus cavicollis LeC., 1866, Smithsn. Inst. Misc. Collect. 6, art. IV, pt. 1, p. 103; Casey, 1890, N. Y. Acad. Sci. Ann. 5: 324; 1891, ibid. 6: 13; Kraus, 1911, U S. Bur. Ent. Tech. Ser. 20, pp. 120, 124; Parkin, 1934, Ann. Appl. Biol. 21 (3): 500; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 8.

L. cavicollis somewhat resembles *linearis* (F.), from which it is differentiated by the 2 rows of punctations in the elytral interspaces, the shallow median fovea, and the secondary sexual characteristics of the female. It closely resembles *planicollis* LeC. (see notes under *planicollis*).

Head declivous, narrower than prothorax; vertex with fine, silken hairs, evenly reticulopunctate, sloping steeply to emarginate postclypeus; frontal lobes broad, thick, and elevated; labrum obcordate; mandibles with rounded notch on outer margin; mentum of male with fine, curvate hairs, approximately three-fourths length of mentum; in female, hairs on each side of mentum, but not along entire posterior margin; antennae long, slightly longer than length of pronotum; basal 2 segments enlarged but not so long as antennal club; last segment of club one-fourth larger and subequal in width to penultimate segment; apical portion of last segment truncate, one-half as wide as basal portion of segment, irregularly 6-sided.

Pronotum rectangular, wider than long, but not so wide as base of elytra; anterior angles obtusely rounded; posterior angles prominent toothed; side margins denticulate, converging toward rear; disk punctate; punctations distinctly separated; fine, long, silken hairs interspersed between punctations; pronotum convex, flattened dorsally with broad median fovea; pleuron and sternum rugose; prothoracic coxal cavities distinctly separated; inner tibial spur of prothoracic leg short, subequal in length to first tarsal segment; outer spur broad and short.

Elytra 3 times as long as wide, sides parallel; striae composed of 2 rows of punctations, each interspace separated by single row of fine hairs on carinula.

Abdomen dull, very finely rugose; sternite of fifth abdominal segment of female triangular shaped, bearing triangular patch of hairs on each side of median line on apical margin; fifth sternite of male rounded, bearing fringe of hairs, but not arranged in triangular patches.

Length 2.5 to 5 mm.

Type locality.—San Diego, Calif.; type (female) in the LeConte collection in the Museum of Comparative Zoology, Cambridge, Mass.

Distribution.—This species is widespread throughout the United States.

Material examined.—(193 specimens).

ARKANSAS: Wilson, March 11, 1919, from *Hicoria* sp.
CALIFORNIA: Alhambra, (R. E. Campbell); Los Angeles County, (Coquillett); Sausalito, (J. C. Thompson).
DISTRICT OF COLUMBIA: Washington, August 1, 1913, (Johnson and Winsatt), from *Fraxinus* sp.
FLORIDA: Apalachicola, March 17, 1913, (W. F. Fiske), from *Fraxinus* sp.
ILLINOIS: West Pullman, May 26, 1918, from *Hicoria* sp.
IOWA: Sioux City, February 27, 1913.
KENTUCKY: Louisville, August 7, 1917.
MISSOURI: St. Louis, May 27, 1914, from *Hicoria* sp.
NEW YORK: New Rochelle, February 21, 1919.
OHIO: Norwood, June 13, 1918, from *Quercus* sp.
SOUTH CAROLINA: Ferguson, March 5, 1910, from *Fraxinus* sp.
TENNESSEE: Memphis, July 7, 1919, from *Fraxinus* sp.
VIRGINIA: Norfolk, April 19, 1918, (R. M. Watt); Portsmouth, August 7, 1917, (T. E. Snyder), from *Fraxinus americana.*

Lyctus chilensis, new species
(Pl. IV, 1–10)

This species resembles *linearis* (Goeze), from which it can be distinguished by the distinct, separated punctations on the pronotum; the broader-than-long pronotum, with distinctly convergent sides; and the small punctations of the elytral interspace.

Head barely declivous, narrower in width than pronotum; vertex convex, rugose, punctate; punctations distinctly separated medianly; pubescence of coarse, curved, silken, golden hairs; vertex roundly sloping to epicranial suture; frontal and postclypeal lobes elevated, separated at lateral margin by V-shaped notch; mandibles bidentate, penultimate tooth not prominent; outer margin of mandible with thick, curvate hairs; labrum emarginate, fringed with hairs; antenna longer than pronotum; basal segments enlarged but shorter than antennal club; terminal segment of antennal club longer than penultimate, subequal in width.

Pronotum wider than long, narrower than base of elytra; anterior margin arcuate; anterior angles obtuse; sides denticulate, subsinuate, definitely convergent posteriorly; posterior angles acute; disk punctate; punctations subcircular and distinctly separate; pubescence of long, coarse hairs; pronotum convex, with deep, broad, ovate median fovea; most specimens with disk bicolored, anterior fifth castaneous, posterior four-fifths piceous; prosternal coxae distinctly separated; inner and outer tibial spurs prominent, cultriform, pointed.

Elytra approximately 3 times as long as wide, sides parallel; interspace, single row of small punctations sometimes irregular, so that 2 punctations may be side by side; punctations separated by single rows of fine hairs on carinulae.

Abdomen dull, finely punctate, rugulose; fifth abdominal sternite of female subtriangular in shape, bearing tufts of long, silky hairs on both sides of

median line; male with fifth sternite rounded apically, without tufts of hairs. Length 3.5 to 5.5 mm.

Type locality.—Angol, Chile.

Type material.—Type and female allotype in the United States National Museum; paratypes in the collections of the United States National Museum, American Museum of Natural History, and University of Maryland.

Described from 20 specimens collected by D. S. Bullock in Angol, June 8, 1933, from wood of *Litraea caustica.*

Lyctus cinereus Blanchard

Lyctus cinereus Blanch., 1851, *in* Gay, Hist. de Chile, v. 5, p. 438, pl. 26, fig. 8; Hopkins, 1911, *in* Kraus, U. S. Bur. Ent. Tech. Ser. 20, pp. 130, 134; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 8.
Lyctus nitidicollis Reitt., 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 197.

L. cinereus can be distinguished from other species by the following: Head broader than pronotum, pronotum narrower than elytra, and elytra with 2 rows of punctations in the interspace, 1 row being quite irregular.

Head declivous, slightly wider than pronotum; vertex convex, with sparse, long hairs, shallowly punctate; vertex sloping abruptly to postclypeus; frontal lobes broad, slightly elevated, forming shallow, broad V with postclypeal lobes; postclypeus broadly emarginate; antennae subequal in length to pronotum; basal 2 segments enlarged, but not so long as antennal club; penultimate segment shorter and subequal in width to terminal segment.

Pronotum subquadrate, narrower than elytra, convex, with faint, shallow median impression and small, shallow canaliculation at base; disk with large, roundly irregular, well-separated punctations; pubescence of fine, silky, golden hairs; anterior margin rounded; anterior angles broadly rounded; sides finely denticulate, subparallel, slightly convergent posteriorly to sharp posterior angle; prothoracic coxae widely separated; inner and outer tibial spurs prominent, pointed, cultriform.

Elytra approximately twice as wide as long, widening slightly posteriorly; carinulae bearing single row of fine, golden hairs, separated by regular row of punctations and irregular row of punctations.

Abdomen finely punctate; fifth abdominal segment rounded at apex. Length 2.5 mm.

Type locality.—Of *cinereus,* Illapel, Chile; of *nitidicollis,* Bogotá, Colombia, and/or Chile.

Distribution.—Apparently South American.

Material examined.—One specimen, reared, September 28, 1910, (Hopkins Collection No. 8365).

Lyctus linearis (Goeze)

(Pl. V, 1–8)

Silpha fusca L., 1767, Systema Nat. (ed. 12), v. 1, pt. 2, p. 573, (believed by Schaum, Paykull, and others to be *linearis* (Goeze), but evidently cannot be proved); Paykull, 1800, Fauna Suecica, v. 3, p. 332; Schaum, 1847, Stettin Ent. Ztg. 8: 318; Lesne, 1916, Paris Mus. d'Hist. Nat. Bul. 22, p. 96.
Dermestes linearis Goeze, 1777, Ent. Beytr., v. 1, p. 148; Thunberg, 1784, Nova Acta Upsal. 4: 4.
Dermestoides unipunctatus Hbst., 1783, *in* Fuessly, Arch. Insectengesch., v. 4, p. 40; Kiesenwetter, 1877, *in* Erichson, Naturgesch. Ins. Deut., Coleopt., v. 5, pt. 1, p. 15; Reitter, 1879, Zool.-Bot. Gesell. Wien, Verhandl. 29: 99; 1885, Best.-Tab. Europ. Coleopt. (ed. 2), v. 1, p. 43; Seidlitz, 1891, Fauna Baltica, Käfer, (ed. 2), p. 234; 1891, Fauna Transsylvanica, Käfer, p. 249; Chittenden, 1895, Ins. Life 7: 328; Everts,

1899, Coleopt. Neerlandica, v. 1, pt. 2, p. 565; Schilsky, 1899, *in* Küster and Kraatz, Käfer Europas, v. 36, p. 74.

Dermestes oblongus Geoff., 1785, *in* Fourcroy, Ent. Paris., v. 1, p. 19.

Ips oblonga Oliv., 1790, Ent. Hist. Nat. Ins., v. 2, p. 7, pl. 1, fig. 52; 1792, Encyclopédie Méthodique, Ins., v. 5, p. 405.

Lyctus canaliculatus F., 1792, Ent. Systematica, v. 1, p. 504; Rossi, 1792, Mant. Ins., p. 98; Panzer, 1793, Faunae Ins. Germ., Fasc. 4, fig. 16; Paykull, 1800, Fauna Suecica, v. 3, p. 332; Fabricius, 1801, Systema Eleutheratorum, v. 2, p. 562; Walckenaer, 1802, Faune Paris., v. 1, p. 257; Gyllenhal, 1813, Ins. Succica, v. 1, pt. 3, p. 408; Redtenbacher, 1849, Fauna Austriaca, Käfer, p. 188; Bach, 1851, Käferfauna für Nord und Mitteldeutschland, v. 1, p. 247; Gutfleisch, 1859, Käfer Deut., p. 405; Thomson, 1859, Skandinaviens Coleopt., v. 1. p. 87; 1863, ibid., v. 5, p. 204; Tournier, 1874, Pet. Nouv. Ent. 6: 411; Marchal, 1888, Feuille Jeunes Nat. 208: 50.

Synchita canaliculata (F.) Hellwig, 1792, Schneid. Mag. 1 (4): 405.

Bitoma unipunctata (Hbst.), 1793, Natursystem Insekten, v. 5, p. 26.

Lyctus oblongus (Oliv.) Latreille, 1804, Hist. Nat. Crust. et Ins., v. 11, p. 241; 1807, Genera Crust. et Ins., v. 3, p. 16; Stephens, 1830, Illus. Brit. Ent., Mandibulata, v. 3, p. 117.

Lyctus pubescens Duft. (not Panzer), 1825, Fauna Austriaca, v. 3, p. 148; Redtenbacher, 1858, Fauna Austriaca, Käfer, (ed. 2), v. 1, p. 358; Tournier, 1874, Pet. Nouv. Ent. 6: 411.

Lyctus striatus Melsh., 1846, Acad. Nat. Sci. Phila. Proc. 2: 112; LeConte, 1866, Smithsn. Inst. Misc. Collect. 6, art. IV, pt. 1, p. 103; Casey, 1890, N. Y. Acad. Sci. Ann. 5: 324; 1891, ibid. 6: 13; Blatchley, 1910, Ind. Dept. Geol. and Nat. Resources Bul. 1, p. 891.

Lyctus axillaris Melsh., 1846, Acad. Nat. Sci. Phila. Proc. 2: 113.

Lyctus fuscus Seidl., 1875, Fauna Baltica, Käfer, p. 161; Lesne, 1916, Paris Mus. d'Hist. Nat. Bul. 22, p. 96.

Lyctus unipunctatus (Hbst.) Kiesenwetter, 1877, *in* Erichson, Naturgesch. Ins. Deut., Coleopt., v. 5, p. 15; Reitter, 1885, Best.-Tab. Europ. Coleopt. (ed. 2), v. 1, p. 43; Seidlitz, 1891, Fauna Transsylvanica, Käfer, p. 249.

Lyctus duftschmidi Des Gozis, 1881, Soc. Ent. de France Ann. 1881: 135.

Lyctus linearis (Goeze) Reitter, 1906, Cat. Coleopt. Europae, p. 423; 1911, Fauna Germanica, v. 3, p. 97; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 125–126; Jacobson, 1913, Käfer Russlands, v. 2, p. 896; Leonard, 1928, N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, p. 416; Lesne, 1932, *in* Soc. Ent. France, Livre du Centennaire, p. 620; Parkin, 1934, Ann. Appl. Biol. 21 (3): 500; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, pp. 9–10; Lepesme, 1944, *in* Encyclopédie Ent., Ser. A, XXII, pp. 77–78.

L. linearis resembles *caricollis* LeC., from which it can be distinguished by the pronotal median fovea, the large single punctations of the elytral striae, and the prominent frontal lobes. *L. linearis* can be distinguished from *chilensis*, n. sp., by the punctations of the pronotum, which run together and produce a reticulated, rugose appearance. In *chilensis* the punctations are well separated.

Head faintly declivous; vertex prominently convex, reticulopunctate; punctations large and irregular, bearing coarse, long hairs; vertex sloping sharply to shelflike postclypeus; frontal lobes thickened, broad, and prominently elevated; labrum emarginate; mandibles small, bearing setae on outer margins; antennae longer than pronotum; basal 2 segments enlarged, though shorter than antennal club; segments of antennal club subequal in length.

Pronotum subquadrate to slightly wider than long; anterior angles rounded; posterior angles toothed; side margins denticulate, subsinuate, and jointly convergent toward rear; disk rugosely punctate, pubescent, with coarse, long hairs; pronotum convex, with deep, circular median fovea; prosternal coxae distinctly separated; inner tibial spur of prothoracic leg short, cultriform; outer tibial spur short, pointed.

Elytra approximately 3 times as long as wide, sides subparallel; interspace composed of single row of large, ovoid punctations, separated by single rows of fine hairs on carinulae.

Abdomen dull, finely punctate; both male and female with fringe of long hairs on fifth sternite; sternite in female more tapering; male broadly and flatly rounded.

Length 2.5 to 5 mm.

Type locality.—Of *canaliculata*, Europe (?).

Distribution.—Cosmopolitan. It is common throughout the United States.

Material examined.—(221 specimens).

ARIZONA: Chiricahua Mountains, June 1906.
CALIFORNIA: San Francisco, June 19, 1911, (A. D. Hopkins), reared from *Hicoria* sp.
CONNECTICUT: New Haven, June 2, 1916, (A. D. Hopkins), reared from *Quercus* sp.
DISTRICT OF COLUMBIA: Washington, April 1907, (A. D. Hopkins), reared from *Fraxinus* sp.
ILLINOIS: Chicago, September 17, 1909, (A. D. Hopkins), reared from *Quercus* sp.; March 29, 1914, (T. E. Snyder), reared from *Quercus rubra*; Moline, August 7, 1917, (A. D. Hopkins), reared from *Quercus* sp.; West Pullman, November 3, 1915, (A. D. Hopkins), reared from *Quercus* sp.
IOWA: Independence, May 20, 1896, (Wickham).
KENTUCKY: Louisville, August 7, 1917, (A. D. Hopkins).
MASSACHUSETTS: Boston, March 4, 1911, (N. S. Whitwell), reared from *Quercus* sp.; Marion; Springfield, June 11, 1898, (G. S. Lewis), from *Rhamnus purshiana*.
NEBRASKA: Lincoln, August 8, 1916, (A. D. Hopkins), reared from white-cedar; North Platte.
NEW YORK: Brockport, April 12, 1907, (A. D. Hopkins), from *Juglans* sp.
PENNSYLVANIA: Philadelphia, (F. G. Hodgeson), from spade handles.
TENNESSEE: Memphis, February 26, 1916, (A. D. Hopkins), reared from *Hicoria* sp.
WASHINGTON: Buckeye, May 22, 1899, (A. D. Hopkins), from *Pinus ponderosa*; Seattle, August 8, 1917, (A. D. Hopkins), reared from *Hicoria* sp.
WISCONSIN: Madison, June 22, 1916, (H. F. Weiss), reared from *Eucalyptus globulosa*; Racine Junction, August 17, 1916, (A. D. Hopkins), reared from *Hicoria* sp.; Sparta, (M. M. Haney), in bookcase.

Lyctus longicornis Reitter

Lyctus longicornis Reitt., 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 197; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 10.

Since specimens of this species are unknown to the author, translation of the original description follows:

Disk of thorax longitudinally more or less widely and deeply foveolate.

Thorax hardly shining, densely, strongly rugose punctate; punctures confluent; fovea in middle oblong, little impressed.

Brunneo-ferruginous, thinly, elytra fulvo-seriatim pubescent; antennae elongate, projecting beyond base of thorax; all segments elongated; segment 10 transversely quadrate; last no narrower than preceding, not much longer than wide, with legs more washed out [in color]; prothorax little shorter than long; elytra sculptured, same as in *L. unipunctatus* [Hbst.]; almost 4 mm. long.

Bogotá (Col. Reitter).

Differing from *unipunctatus* by much longer antennae and shorter, more uniformly, rugosely punctate pronotum, with shallower, externally more blurred, longitudinal pit.

Lyctus opaculus LeConte

(Pl. V, 9–16)

Lyctus opaculus LeC., 1866, Smithsn. Inst. Misc. Collect. 6, art. IV, pt. 1, p. 103; Casey, 1890, N. Y. Acad. Sci. Ann. 5: 324; 1891, ibid. 6: 13; Blatchley, 1910, Ind. Dept. Geol. and Nat. Resources Bul. 1, pp. 891–892;

Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 119, 123; Leonard, 1928, N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, p. 416; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 10.

Lyctus brevipennis Csy., 1924, Mem. Coleopt. 11, p. 183; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 7, (new synonymy).

L. opaculus can be readily distinguished by its rounded, convex pronotum, with obsolete anterior angles and convergent side margins.

Head faintly declivous, narrower than pronotum; vertex deeply punctate; punctations reticulate and irregular; long, silken hairs sparse; vertex faintly convex, sloping to rounded, deeply emarginate postclypeus; frontal lobes rounded, not elevated, forming deep, broad V with lateral lobes of postclypeus; labrum retuse and angled ventrad; antennae slightly longer than pronotum; penultimate segment of club subequal in length and wider than last segment.

Pronotum longer than wide, convex, rugosely punctate; anterior margin broadly rounded; anterior angles obsolete; sides convergent posteriorly, slightly denticulate, with bluntly rounded, subobsolete, posterior lateral angles; disk convex, sparsely covered with long, silken hairs; prothoracic coxae widely separated; inner tibial spur small, outer tibial spur reduced in size.

Elytra approximately 3 times as long as wide, widening slightly apically; disk convex, bearing 6 distinct carinae, each with 2 or more rows of recumbent, fine hairs; interspace with 2 or more rows of punctations separated by carinulae bearing fine hairs.

Abdomen dull, punctate; fifth sternite of female subtriangular, with divided median patch of long setae on apical margin; males with rounded fifth sternite, with broad fringe of short hairs on apical margin.

Length 3.5 to 5 mm.

Type locality.—Of *opaculus*, Pennsylvania, type (female) in LeConte collection, Museum of Comparative Zoology, Cambridge, Mass.; of *brevipennis*, District of Columbia, type in Casey collection, United States National Museum.

I have placed *brevipennis* in synonymy with *opaculus* after thorough examination of the one specimen on which Casey based his species. There is no doubt in my mind that this is *opaculus*.

Distribution.—This species is apparently distributed throughout the nearctic region. Blatchley (*17*) records it throughout Indiana from oak.

Material examined.—(9 specimens).

COLORADO: Julesburg, about 3,460-foot altitude, June 7, 1920.
MASSACHUSETTS: Springfield, May 20, 1898, (G. Dimmock), in grapevine.
NEW YORK: Ithaca; Olcott, June 28, 1925, (H. Dietrich).
NORTH CAROLINA: Round Knob, (Hubbard and Schwartz).
OHIO: Conneaut, March 1933, (G. A. Runner), in grape.
CANADA: Toronto, July 1902, (R. J. Grew).

Lyctus parvulus Casey
(Pl. VI, 1–5)

Lyctus parvulus Csy., 1884, Contrib. Desc. Systematic Coleopt. N. Amer., pt. 2, p. 175; 1890, N. Y. Acad. Sci. Ann. 5: 325; 1891, ibid. 6: 13; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 120, 125; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 10.

L. parvulus can be distinguished from *opaculus* LeC. by the broader-than-long thorax.

Head declivous, narrower than pronotum; vertex with sparse, long hairs; reticulopunctate, punctations granulose; vertex sloping sharply to postclypeus; frontal lobes broad, slightly elevated, forming shallow, broad V with

lateral lobes of postclypeus; postclypeus short, strongly emarginate; labrum emarginate; last segment of maxillary palpi thick and somewhat enlarged; antennae subequal in length with pronotum; basal 2 segments enlarged, but not so long as antennal club; penultimate segment of club shorter but broader than last segment.

Pronotum wider than long, narrower than elytra, convex, with shallow, longitudinal median impression and narrow canaliculation at base; disk reticulopunctate, with sparse, thickened, golden hairs; anterior angles rounded, obsolete; sides converging strongly posteriorly, slightly denticulate; posterior angles obtuse; prothoracic coxae separated; inner tibial spur short; fifth segment of tarsi of prothoracic leg as long as other 4 combined.

Elytra 2¼ times as long as wide, widening posteriorly; interspace composed of 2 irregular rows of elongate punctations, each interspace separated by single row of thick, golden hairs on carinula; humeral angles of elytra quite hirsute.

Abdomen dull, punctate; fifth abdominal sternite of female subtriangular, with triangular tuft of hairs on either side of median line at apical margin; male with rounded fifth sternite, fringed with long setae at median half.

Length 2.7 to 4.5 mm.

Type locality.—Arizona. Other specimen in box in Casey collection from Santa Cruz Mountains, Calif. Type specimen in Casey collection in the United States National Museum, No. 48838. There is also a female specimen from Arizona in the LeConte collection of the Museum of Comparative Zoology, Cambridge, Mass., labeled "Type."

Distribution.—This species is apparently distributed in the Southwestern United States.

Material examined.—(4 specimens).

ARIZONA: Chiricahua Mountains, (Hubbard and Schwartz).
CALIFORNIA: Santa Cruz Mountains.

Lycus planicollis LeConte

(Pls. VII, 1–12, and XIV, 1)

Lyctus planicollis LeC., 1858, Acad. Nat. Sci. Phila. Proc. 10: 74; 1866, Smithsn. Inst. Misc. Collect. 6, art. IV, pt. 1, p. 103; Duges, 1883, Soc. Ent. de Belg. Ann. 27: 56; Casey, 1890, N. Y. Acad. Sci. Ann. 5: 324; Hopkins, 1905, U. S. Dept. Agr. Cir. 55, p. 2; Blatchley, 1910, Ind. Dept. Geol. and Nat. Resources Bul. 1, pp. 891, 892; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 120, 124–125; Lesne, 1916, Paris Mus. d'Hist. Nat. Bul. 22, pp. 92, 95, 96; Leonard, 1928, N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, p. 416; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 11.

?Lyctus carbonarius Waltl, 1832, Faunus 1: 167; Silbermann, 1834, Rev. Ent. 2: 254; Lesne, 1916, Paris Mus. d'Hist. Nat. Bul. 22, p. 93, (considered *carbonarius* as a synonym of *planicollis*); 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 11.

Form *Lyctus leacocianus* Woll., 1860, Ann. and Mag. Nat. Hist. (ser. 3) 5: 256; Lesne, 1916, Paris Mus. d'Hist. Nat. Bul. 22, p. 94.

Form *Lyctus modestus* Lesne, 1911, Paris Mus. d'Hist. Nat. Bul. 17, p. 534; 1916, ibid. 22, p. 95.

L. planicollis can be distinguished by its average large size and wider-than-long prothorax, with distinctly separated, not reticulated, punctations on the disk. It closely resembles *cavicollis* LeC., from which it can be distinguished with difficulty. The only difference appears to be that the 10th antennal segment of *planicollis* is wider than it is long, whereas in *cavicollis* it is not wider than long.

L. planicollis is quite variable. Though the LeConte types of *planicollis* and *cavicollis* appear slightly different, particularly in

the shape of the thorax, the exact relationship of the 2 species is open to question. A group of reared specimens will vary enough to form a continuous series from what may be considered a typical *cavicollis* to a typical *planicollis*. To confuse the issue further, Lesne and others have considered that *carbonarius* may be a synonym of *planicollis*. If that is correct, then *carbonarius*, 1832, has priority over *planicollis*, 1858.

Head declivous, narrower than thorax, convex, distinctly punctate, covered with fine hairs; vertex sloping to broadly emarginate postclypeus; frontal lobe broad, prominent, elevated, forming deep, wide V with lateral lobes of postclypeus; labrum emarginate; posterior margin of mentum of male with fine, long, anteriorly recurved hairs; mentum of female with short, recumbent hairs; antennae as long as pronotum; basal 2 segments enlarged, shorter than antennal club; penultimate segment of antennal club shorter in length and subequal in width to last segment of club.

Pronotum wider than long, narrower than elytra, convex, with median impression and deep median canaliculation on basal fifth; punctations distinct, widely separated; anterior angles rounded, subobsolete; sides denticulate, slightly sinuate, convergent; posterior angles bluntly angulate; prothoracic coxae widely separated; inner tibial spur cultriform, outer tibial spur short.

Elytra 2⅔ times as long as wide, sides subparallel; interspace composed of 2 regular series of elongate punctations; each stria separated by single row of fine, long hairs.

Abdomen dull, finely punctate; fifth sternite of female subtriangular, with fringe of long setae on either side of median line; male with fifth sternite rounded, with fringe of setae on apical margin.

Length 4 to 6 mm.

Type locality.—*L. planicollis* was described from a series from California, Illinois, and Texas. The type evidently was collected at the junction of the Colorado and Gila Rivers. The unlabeled types are in the LeConte collection at the Museum of Comparative Zoology at Cambridge, Mass. *L. carbonarius* was described from Mexico.

Distribution.—This species appears to be predominantly nearctic in range, occurring throughout the United States and parts of Mexico. It has been reported from Europe, where it had been introduced.

Material examined.—(96 specimens).

CALIFORNIA: Placerville, June 8, 1913, (T. J. Sullivan), in *Quercus*.
DELAWARE: Newark, April 1935, (L. A. Stearns).
FLORIDA: Crescent City, April 1, 1896, from bamboo; Daytona Beach, March 15, 1916, (C. A. Stoughton), from *Quercus alba*.
GEORGIA: Sardis, March 28, 1932, in ash; Savannah, March 23, 1931, (H M. Meador).
IDAHO: Burley, October 18, 1940, (J. C. Evendon), from applewood.
ILLINOIS: Summerville, May 13, 1932, from oak flooring.
INDIANA: Columbus, February 1932, in hickory.
IOWA: Sioux City, March 11, 1904.
KANSAS: Cherryvale, February 28, 1917, (W. E. Ringle).
LOUISIANA: New Orleans, October 30, 1931, from hickory; Tallulah, April 14, 1919, (E. S. Tucker), in hickory hatchet handles.
MARYLAND: Baltimore, January 12, 1916, from *Quercus* sp.
MISSOURI: St. Genevieve, May 7, 1934, from sycamore; St. Louis, June 1938, from hardwood floor; Verona, May 13, 1910, (I. Askins).
NEW JERSEY: Hoboken, February 24, 1941, from Colombia on wild Cattleya orchid.
OHIO: Columbus, February 27, 1913, in ash handle; Gibsonburg; Norwood, August 7, 1917, from *Quercus* sp.
RHODE ISLAND: Pawtucket, July 12, 1915, (A. E. Stene).

TENNESSEE: January 31, 1911, from *Quercus* sp.
TEXAS: Ellis County, March 23, 1939, (R. W. Willis).
VIRGINIA: King William County, May 4, 1942, (L. A. Hetrick), from hickory tool handle; Portsmouth, June 27, 1916, from *Fraxinus americana*.
WASHINGTON: Walla Walla, June 1929, (M. C. Lane).
PANAMA CANAL ZONE: Corozal, June 27, 1928, (J. Zetek).

Lyctus praeustum Erichson
(Pl. VI, 6–11)

Lyctus praeustum Er., 1847, Arch. f. Naturgesch. 13: 88; Kirsch, 1873, Berlin. Ent. Ztschr. 17: 402; Hopkins, 1911, *in* Kraus, U. S. Bur. Ent. Tech. Ser. 20, pp. 131, 133.
Trogoxylon praeustum (Er.) Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 16.

L. praeustum appears to be indistinguishable from *brunneus* (Steph.), except for the elytra, which are longer than wide. Lack of material prevents a detailed study, which probably would prove that this species is synonymous with *brunneus*.

Head faintly declivous, slightly narrower than pronotum; vertex shallowly punctate; punctations circular and widely separated; sparsely hirsute, with long, silky hairs; frontal lobes elevated, forming broad notch with postclypeal lobes; postclypeus broadly retuse, with long, silky hairs; labrum obcordate; antennae shorter than pronotum.

Pronotum convex, rectangular, longer than broad; anterior margin broadly rounded; anterior angles obtuse; sides straight, denticulate, subparallel; posterior angles blunt; disk with widely separated punctations and fine, sparse, silky hairs; prosternal coxae separated; inner tibial spur large, cultriform; outer spur smaller, pointed.

Elytra 2⅓ times as long as wide, sides straight, widening slightly distally; striations with single row of arcuate punctations separated by row of very fine, silky hairs on carinulae.

Length 1.3 to 4 mm.

Type locality.—Peru (?).

This species was placed in *Trogoxylon* (Lesne *129*). The narrow metathoracic femur and striated punctations on the elytra require that it be placed in the genus *Lyctus* F.

Distribution.—Apparently a neotropical species, having been recorded only from Peru and Brazil.

Material examined.—(2 specimens).

BRAZIL: Pernambuco.

Lyctus simplex Reitter
(Pl. VIII, 1–7)

Lyctus simplex Reitt., 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 198; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 12.

L. simplex can be readily distinguished by its villose appearance; the pronotum narrower than the base of the elytra; and the anterior margin of the pronotum bisinuate, with toothed anterior angles.

Head faintly declivous, as wide as thorax; vertex coarsely reticulopunctate, densely covered with broad, arcuate hairs; vertex sloping gently to form broad incision with postclypeus; frontal lobe wide and elevated; postclypeus broadly emarginate, thickened medianly along vertical axis, not elevated; labrum obcordate, sloping ventrally; mandibles without prominent notch, though bearing arcuate setae on rugose-punctate outer margin; antennae long, 1½ times as long as pronotum; funicle narrow compared to club; basal 2 segments not so long as club; last segment of club 1¼ times as long as penultimate, subequal in width.

Pronotum suboctagonal, convex, rugose punctate, with deep median fovea, covered with long, arcuate hairs; margins of thorax coarsely denticulate; prothoracic coxae contiguous; inner tibial spur small; fifth segment of metathoracic tarsi elongate, 1¾ times as long as other 4 combined.

Elytra widening slightly apically, approximately 3 times as long as broad; striae composed of regular rows of 2 to 3 ovate punctations per row; each row separated by thickened, arcuate setae, each alternate row forming more prominent, raised, thickened hirsute line, in-between rows having slightly finer hairs.

Abdomen dull, faintly punctate; female with apparently thickened, elevated median portion of fifth sternite, with "spicule" of long, silken hairs; male without raised median section of tuft of hairs.

Length 3.5 to 5 mm.

Type locality.—Of *simplex*, La Luzera, Colombia.

Distribution.—This species is neotropical in distribution.

Material examined.—(43 specimens).

BOLIVIA: La Paz, Department Calasaya, (G. I. Harrington).
COLOMBIA: Bogotá, April 1914; 1916, (Br. Apollinaire-Marie); Pasto, August 4, 1939, (F. L. Gallegro M.), on rose apple.
ECUADOR: Quito, October 13, 1944, (M. A. Cevallos S.).

Lyctus tomentosus Reitter

Lyctus tormentosus Reitt., 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 198; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 12.

Since specimens of this species are unknown to the author, translation of the original description follows:

Disk of thorax hardly foveolate flat or with simple longitudinal, subimpressed line.

Thorax with dorsum flat, not impressed in middle.

Red-brown to rather black, opaque, very densely covered with long pubescence, depressed, tawny-ash, subseriatim on elytra; antennae short, segments 6 to 9 transverse, club abrupt, first segment strongly transverse, last short ovate, with legs ferruginous; head and prothorax densely punctate rugose, latter no longer than wide, flat above; elytra very finely but deeply rugulose, very finely striate punctate; interstriae not convex, subflat, level; elytra almost concealed by pubescence arranged in compact, equal rows; 3 mm. long.

Mexico (Col. Reitter).

Dark antennae, legs rust red, former very short; upper side so densely covered with long, decumbent, rough, yellowish-gray pubescence that body almost concealed by it; pronotum flat, extremely compactly, rugosely punctate; likewise elytra uniformly transversed at base by very fine but deep rugae, with fine regular rows of punctures between them, also distinct at suture.

Collected in great numbers by Bilimek in Mexico.

Lyctus villosus Lesne
(Pl. VIII, 8–15)

Lyctus villosus Lesne, 1911, Paris Mus. d'Hist. Nat. Bul. 17, p. 537; 1925, *in* Encyclopédie Ent., Ser. B, Coleopt., v. 1, p. 31; Scott, 1925, Hawaii. Ent. Soc. Proc. 6: 213, (re Scott, 1910, *in* Sharp, Fauna Hawaiiensis, Coleopt. IV, v. 3, p. 644); Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 12; Arnett, 1952, U. S. Bur. Ent. and Plant Quar. E–844, pp. 3–4.

L. villosus can be readily distinguished by its villose appearance, the pronotum narrower than the base of the elytra, the deep median fovea, and the rounded anterior margin of the pronotum.

Head declivous, slightly narrower than pronotum; vertex coarsely punctate, covered with broad, arcuate hairs; vertex and frontal lobes gently sloping and continuous with postclypeus; labrum retuse, lying in same plane as post-

clypeus; antennae as long as pronotum; antennal club sienna, large, one-half as long as entire funicle; last segment of club at least twice as long as penultimate; basal 2 segments of antennae not so long as club.

Pronotum subquadrate; anterior margin broadly rounded; anterior angles distinct; side margins parallel, denticulate; posterior angles sharply defined; disk deeply punctate, convex with shallow median fovea, covered with broad, arcuate hairs; prothoracic coxae widely separated; inner tibial spur large and elbowed, outer spur at right angles to inner spur; fifth segment of metathoracic tarsi subequal in length to remaining 4 combined.

Elytra subparallel, faintly sinuate, approximately 2 times as long as wide; striae composed of large orbicular punctations separated by rows of broad, arcuate setae; rows beginning with row adjacent to elytral suture more prominent than alternate rows.

Abdomen dull, faintly punctate; no apparent secondary sexual difference.

Length variable, 1.7 to 3.3 mm.

Type locality.—Of *villosus*, Zacoalco (Jalisco), Mexico.

Distribution.—This species is neotropical in distribution, having been reported throughout the Caribbean area and as far north as Arizona and Florida.

Material examined.—(33 specimens).

ARIZONA: Nogales, June 30, 1927, (L. R. Dorland).
FLORIDA: Tampa, January 29, 1936, (E. B. Ford), from Ecuador in balsam wood.
CUBA: Habana, November 1935, (C. C. Aguayo), in cedar furniture.
DUTCH GUIANA: March 1938, in banak wood.
EL SALVADOR: San Salvador, 1920, (S. Calderon).
MEXICO: Jalisco, cerca Lake Zacoalco, 1900, (L. Diguet), in deadwood of *Leucaena esculenta*.
PUERTO RICO: Coamo, February 27, 1924, (G. N. Wolcott), from leguminous tree.

Genus *Minthea* Pascoe

Minthea Pascoe, 1866, Jour. Ent. 2: 97; Arrow, 1904, Ent. Monthly Mag. 40: 35–36; Reitter, 1911, Fauna Germanica, v. 3, p. 96; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, p. 115; Jacobson, 1913, Käfer Russlands, v. 2, p. 896; Lesne, 1924, *in* Encyclopédie Ent. III, pp. 79, 94; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 13.

Lyctopholis Reitter, 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 196, 199; 1880, Ent. Monatsbl., p. 88; Everts, 1899, Coleopt. Neerlandica, v. 1, pt. 2, pp. 565–566; Kalshoven, 1923, Tectona, v. 16, p. 721; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 13.

Head declivous, slightly narrower than pronotum; vertex convex, punctate; pubescence on head of erect, squamous hairs in clumps, usually over eyes on supraorbital ridge and on frontal and postclypeal lobes; mentum of female glabrous, of male with long, erect hairs; antennae with terminal segment elongate, equal to or longer than penultimate; segments of funicle with semierect, squamous hairs.

Pronotum subquadrate or slightly longer than wide; lateral margins denticulate, outlined by erect, flattened hairs, inserted in each denticula; pubescence on disk of erect, squamous hairs intermixed with fine, recumbent hairs; prothoracic coxae close but separated; inner tibial spur prominent.

Elytra twice as long as wide, with 6 to 7 rows of erect, flattened, whitish hairs, usually separated by row of fine, recumbent hairs.

Abdomen dull; first sternite long, remaining 4 much smaller in size; fifth sternite of female usually bearing tuft of hairs.

Type species.—Of *Minthea, M. squamigera* Pasc. (designated by Arrow (*6*); of *Lyctopholis, L. stichothrix* Reitt. (present designation). *Lyctopholis* is synonymous with *Minthea*, because the genotypes of these genera are subjective synonyms.

Key to New World Species of *Minthea*

1. Terminal antennal segment subequal or less than 2 times as long as penultimate; thorax with median fovea..... 2
   Terminal antennal segment 2 or more times as long as penultimate; thorax convex; pronotal pubescence of fine, recumbent hairs intermixed with clavate, scalelike hairs..... 3
2. Thoracic fovea deeply and distinctly reticulated; lateral margin of thorax with approximately 10 narrow hairs.....*reticulata* Lesne
   Thoracic fovea punctate, not distinctly reticulated; lateral margin of thorax with approximately 19 broad hairs.....*rugicollis* (Wlk.)
3. Thoracic punctations large, shallow, reticulated; last abdominal segment without long tufts of hairs; antennal club with terminal segment 3 times length of penultimate.....*obstita* (Woll.)
   Thoracic punctations rugose, small; last abdominal segment with 2 long, thick, triangular tufts of hairs; antennae with terminal segment 2 times penultimate .....*squamigera* Pasc.

Minthea obstita (Wollaston)

(Pl. IX, 1–8)

Lyctus obstitus Woll., 1867, Coleopt. Hesperidum, p. 112.

Minthea obstita (Woll.) Lesne, 1909, Paris Mus. d'Hist. Nat. Bul. 15, p. 349; 1924, *in* Encyclopédie Ent. III, p. 95; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 13.

M. obstita can be distinguished by the elongate terminal segment of the antennae, which is 3 times the length of the penultimate segment.

Head declivous, slightly narrower than pronotum; vertex shiny, convex, irregularly and deeply rugosely punctate; pubescence of fine, short hairs and erect, yellowish-white, truncately spatulate hairs; narrower than in *M. rugicollis*, grouped into clumps, 1 set above each eye on supraorbital ridge, 1 set on each frontal lobe, triangular patch on disk of vertex, and 1 clump at each lateral lobe of postclypeus; vertex sloping rather abruptly to shiny postclypeus; frontal lobes subcontiguous with postclypeal lobes; labrum emarginate; mandibles with median patch of curvate hairs on outer margin; antennae longer than pronotum; apical 2 segments that form club without thick, spatulate, squamiform hairs, much larger than other segments, apical segment twice as long and slightly narrower than penultimate.

Pronotum as long as wide, narrower in width than elytra; anterior margin rounded; anterior angles blunt; side margins denticulate, usually with less than 12 teeth, straight, convergent gradually to acute posterior angles; disk convex with shallow, narrow median fovea; pubescence of fine hairs and erect, truncate spatulate hairs, which outline prothorax and form indefinite double-horseshoe pattern on disk; prothoracic coxae close but separated; inner tibial spur prominent, hooked, pointed; outer tibial spur mere blunt thumb.

Elytra twice as long as wide, side margins subparallel, widening slightly posteriorly; erect, truncately spatulate hairs dull white, forming 7 rows on each elytron, each row of erect hairs separated by 2 rows of rounded, shallow punctations, which in turn are separated by row of fine hairs.

Abdominal segments dull; fifth sternite with apical margin deflexed, forming broad median notch; female with apical median patch of hairs, male without median patch of hairs.

Length 2 to 2.5 mm.

Type locality.—San Iago, Cape Verde, under dead bark of *Ficus*.

Distribution.—*M. obstitus* has been recorded from many parts of Africa (Middle Niger, Gabon, Rhodesia, Dar es Salaam, Cape Verde, Madagascar, Senegal, French Guinea, Tchad), and is apparently Ethiopian in distribution.

Host plants.—*Ficus* sp., *Acacia albida*, *Kompitsia* sp., in racemes of manioc.

Material examined.—(19 specimens).

IOWA: Iowa City, May, from wood from Portuguese West Africa.

LOUISIANA: New Orleans, September 11, 1950, from Monrovia, Liberia, in mahogany.

CUBA: Santiago de las Vegas, Habana, June 23, 1926.

Minthea reticulata Lesne

(Pl. IX, 9–17)

Minthea reticulata Lesne, 1931, Paris Mus. d'Hist. Nat. Bul. (ser. 2) 3, pt. 1, p. 98, fig. 2; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 13.

M. reticulata can be distinguished by the terminal segment of the antenna, which is subequal to the penultimate; a deep median fovea, reticulopunctate; and the denticulate lateral margin of the pronotum, with approximately 10 squamose hairs.

Head slightly declivous, slightly narrower than pronotum; vertex dull, convex; punctations large, deep, reticulate; pubescence consisting of elongate, truncately spatulate, yellowish hairs; 1 clump over each eye on protruberance of supraorbital ridge, another clump on each elevated frontal lobe and on lateral lobes of large punctated, slightly depressed postclypeus, another sparse patch on disk of vertex; vertex sloping abruptly to postclypeus; epicranial suture deep, canaliculate; labrum emarginate; mandibles with median patch of curvate hairs on ledge on outer margin; antennae longer than pronotum; apical 2 segments that form club larger than others and without spatulate, squamiform, recumbent hairs; ultimate segment subequal to or slightly longer and narrower than penultimate, tapering apically, covered with fine hairs, presenting dull appearance in contrast to shiny penultimate segment.

Pronotum as long as wide, narrower in width than elytra; anterior margin truncately rounded; anterior angles obsolete; side margins somewhat rounded; posterior angles acute; pronotum appearing octagonal in shape; disk with elongated median fovea; punctation large, deep, irregular, reticulate; pubescence consisting of elongate, spatulate hairs outlining pronotum and forming double row encircling fovea; sides of pronotum denticulate, with less than 12 teeth, bearing elongated, spatulate hairs; prothoracic coxae close but separated; inner tibial spur prominent, cultriform; outer spur pointed protuberance of tibia.

Elytra twice as long as wide, broadening slightly posteriorly; erect, thick, elongate, truncately spatulate hairs, yellowish, forming 6 rows on each elytron; each row of erect hairs separated by 2 rows of large, circular, shallow punctations.

Abdominal segments dull, finely punctulate; fifth sternite of female with sparse fringe of hairs on apical margin.

Length 2.3 to 3.5 mm.

Type locality.—Described from a series from Austral-Malaya; type in Museum of Natural History, Paris.

Distribution.—Malayan and Austral-Malayan. This species has been reported by Lesne from Saigon; Palembang, Sumatra; Sarawak, Borneo; Philippines; Makassar, Celebes; Ceram; New Guinea.

Material examined.—(2 specimens).

MASSACHUSETTS: Boston, April 7, 1941, from Batavia, Netherlands East Indies, in wooden cases.

PHILIPPINES: From *Shorea eximia*.

Minthea rugicollis (Walker)

(Pls. X, 1–7, and XIV, 2)

Ditoma rugicollis Wlk., 1858, Ann. and Mag. Nat. Hist. (ser. 3) 2: 206.

Minthea similata Pasc., 1866, Jour. Ent. 2: 141; Waterhouse, 1894, Ann. and Mag. Nat. Hist. (ser. 6) 14: 68, (places *similata* in synonymy).

Lyctus rugicollis (Wlk.) Waterhouse, 1876, Ann. and Mag. Nat. Hist. (ser. 4) 18: 117; Sharp, 1886, Linn. Soc. London, Jour. 19: 117.

Lyctopholis foveicollis Reitt., 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 199; Everts, 1899, Coleopt. Neerlandica. v. 1, pt. 2, p. 566; Arrow, 1904, Ent. Monthly Mag. 40: 35–36, (places *foveicollis* in synonymy); Everts, 1922, Coleopt. Neerlandica, v. 3, p. 253.

Eulachus hispida Blackb., 1885, *in* Blackburn and Sharp, Roy. Dublin Soc. Sci. Trans. (ser. 2) 3: 141; Arrow, 1904, Ent. Monthly Mag. 40: 35–36, (places *hispida* in synonymy).

Minthea rugicollis (Wlk.) Waterhouse, 1894, Ann. and Mag. Nat. Hist. (ser. 6) 14: 68, (removed *D. rugicollis* from Colydiidae and placed it in *Minthea* of Lyctidae); Arrow, 1904, Ent. Monthly Mag. 40: 35–36; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, p. 127; Reitter, 1911, Fauna Germanica, v. 3, p. 97; Sharp and Muir, 1912, Ent. Soc. London, Trans. 3: 534; Jacobson, 1913, Käfer Russlands, v. 2, p. 896; Lesne, 1924, *in* Encyclopédie Ent. III, pp. 95–96; 1937, Paris Mus. d'Hist. Nat. Bul. (ser. 2) 9, p. 321; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 13.

M. rugicollis can be distinguished by the terminal segment of the antennae, which is slightly longer than the penultimate; the punctate but not reticulate median fovea; and the lateral margin of the pronotum, bearing approximately 19 squamous hairs.

Head slightly declivous, narrower than pronotum; vertex dull, irregularly reticulopunctate; pubescence of fine, short hair and broad, amber-colored, spatulate hairs, grouped into clumps; 1 set above each eye on supraorbital ridge, 1 set on each frontal lobe, patch on disk of vertex, and 1 set on each lateral lobe of postclypeus; vertex sloping somewhat abruptly to dull postclypeus; frontal lobes subcontiguous with postclypeus; labrum obcordate; mandibles with median patch of thick, arcuate hairs on outer margin; antennae longer than pronotum; apical 2 segments that form club without spatulate, squamiform hairs much longer than other segments, which each bear ring of broad, semirecumbent, squamiform hairs; apical segment of club slightly less than 1½ times as long as penultimate.

Pronotum subequal in length and width, narrower in width than elytra; middle third of anterior margin blunt; side portions sloping away at 45° angle; anterior angles distinct, blunt; side margins denticulate, usually with more than 12 teeth, very slightly sinuate, convergent toward acute posterior angles; disk convex, with deep, broad, longitudinal median fovea; pubescence composed of fine hairs and erect spatulate hairs, which outline prothorax, form pattern around median fovea; 2 longitudinal rows on either side of fovea, 1 horizontal row immediately over fovea and crossing horizontal row of erect hairs; prothoracic coxae close, almost contiguous; inner tibial spur broad at base and forming hooked point; outer tibial spur merely short, blunt prolongation of tibia.

Elytra approximately 2 times as long as wide, side margins subparallel, widening slightly posteriorly; erect, spatulate hairs forming 6 yellowish-white rows on each elytron; each row of erect hairs separated by 2 rows of circular punctations, which in turn are separated by faint row of recumbent, fine hairs.

Abdomen dull, finely punctulate; fifth abdominal sternite of female with heavy fringe of hairs on apical margin; male with few sparse hairs on apical margin.

Length 2.0 to 3.0 mm.

Type locality.—Of *rugicollis*, Ceylon; of *foveicollis*, Santo Domingo.

Distribution.—Apparently tropicopolitan, having been reported from the oriental, Australian, Ethiopian, and neotropical faunal

regions. Lesne (*119*) lists this species from Indomalaya to Madagascar, and from the Antilles, Belgian Congo, Dahomey, French Guinea, Hawaii, India, Indochina, Ivory Coast, and New Caledonia.

Host plants.—Browne (*23*) found *rugicollis* in wood, representing 24 families, 52 genera, and 93 species. Wood of the following genera of trees is most susceptible: *Afzelia*, *Artocarpus*, *Avicennia*, *Bombax*, *Helicia*, *Koompassia*, *Parashorea*, and *Shorea*.

Material examined.—(60 specimens).

FLORIDA: Miami, November 30, 1944, on plane from Rio de Janeiro, Brazil, via Guantánamo, Cuba.

MASSACHUSETTS: Boston, April 7, 1941, from Batavia, Netherlands East Indies.

NEW YORK: New York, December 7, 1938, from British Guinea on dry plants; June 25, 1939, from Belgian Congo in tree seeds; June 4, 1941, from Netherlands East Indies in rattan stems.

PENNSYLVANIA: Philadelphia, October 9, 1929, from Rangoon, Burma, in bamboo; August 1, 1933, (Kisliuk), from India in wooden cases.

TEXAS: Brownsville, May 27, 1936, from Mexico on pineapple; Corpus Christi, July 29, 1934, in hardwood floor; Galveston, November 4, 1940, from India under bark.

BRAZIL: Rio de Janeiro, November 1919, (E. G. Holt).

CHILE: Santiago, March 26, 1945, (G. O. Faure), from India in boxes of tea.

EL SALVADOR: San Salvador, 1920, (S. Calderon).

PANAMA: Ancon, 1924, in wood amargo; Canal Zone, (J. Zetek), on ivory nuts; Pueblo Nuevo, August 26, 1918, (J. Zetek), from decayed papaya.

PUERTO RICO: Mayagüez, May 10, 1944, (H. K. Plank), in dried *Derris elliptica* roots.

VENEZUELA: Caracas, (H. Pittier), in *Haematoxylum* sp.

Minthea squamigera Pascoe

(Pl. X, 8–13)

Minthea squamigera Pasc., 1866, Jour. Ent. 2: 97; Reitter, 1880, Ent. Monatsbl., p. 88; Lesne, 1937, Soc. Ent. de France Bul. 42, p. 240; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 13.

Lyctopholis stichothrix Reitt., 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 199; 1911, Fauna Germanica, v. 3, p. 97; Lesne, 1937, Soc. Ent. de France Bul. 42, p. 240. (places *stichothrix* in synonymy).

Minthea stichothrix (Reitt.) Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, p. 127; Leonard, 1928, N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, p. 416.

M. squamigera can be distinguished by the elongate terminal segment of the antennae, which is 2½ times as long as the penultimate, and the rugose thoracic punctations.

Head barely declivous, slightly narrower than pronotum; vertex dull, irregularly reticulopunctate; pubescence of erect, thick, yellowish-white, truncately spatulate hairs, grouped in line on supraorbital ridge; clump on each frontal lobe and on each lateral lobe of postclypeus; vertex sloping abruptly to shiny postclypeus; frontal lobes contiguous and continuous with postclypeal lobes; labrum emarginate; mandibles with median patch of curvate hairs on outer margin; antennae as long as pronotum; thick, recumbent, squamiform hairs on funicle of antennae, thick but not squamiform hairs on segments of antennal club; last apical segment of antennal club 2½ times as long as penultimate.

Pronotum slightly longer than wide, narrower in width than elytra; anterior margin rounded; anterior angles distinct acute; sides parallel, straight, finely denticulate, with approximately 12 teeth; posterior angles acute; disk strongly convex, thickly, irregularly reticulopunctate; pubescence of fine hairs and erect, short, truncately spatulate hairs, which outline prothorax and present confused appearance on disk; prothoracic coxae close, almost

contiguous; inner tibial spur prominently hooked, pointed; outer tibial spur merely small, blunt protuberance of tibia.

Elytra slightly more than twice as long as wide, side margins parallel, subsinuate; erect, truncately spatulate, yellowish-white hairs, forming 6 rows on each elytron; each row separated by 2 rows of rounded, shallow punctations.

Abdomen shiny; fifth abdominal sternite of female with large triangular patch of long, silken hairs on either side of median line; male not observed.

Length 1 to 2.75 mm.

Type locality.—Of *squamigera*, Ega, Amazon Valley, Brazil; of *stichothrix*, Bogotá, Colombia.

Distribution.—This species is apparently neotropical in distribution.

Material examined.—(3 specimens).

ARGENTINA: 1931, (G. L. Harrington).
PERU: Lima, September 1943, (J. E. Wille).

Genus *Lyctoxylon* Reitter

Lyctoxylon Reitter, 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 196; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, p. 115; Jacobson, 1913, Käfer Russlands, v. 2, p. 896; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 14.

This genus can readily be distinguished by the elongate antennal club. Both segments are longer than broad, the terminal segment being narrower than the penultimate. The head bears groups of thickened, erect hairs over the margin of the eyes and on the frontal and postclypeal lobes. The elytral pubescence is composed of irregular rows of thick, semierect hairs.

As the genotype is the only species reported from the New World and as it is fully described below, no further generic description is deemed necessary.

Type species.—Of *Lyctoxylon, L. japonum* Reitt. (monobasic).

Lyctoxylon japonum Reitter

(Pls. X, 14-23, and XIV, 3)

Lyctoxylon japonum Reitt., 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 199; Schilsky, 1900, *in* Küster and Kraatz, Käfer Europas, v. 38, p. 36; Lefroy and Howlett, 1909, Indian Ins. Life, p. 313; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, p. 126; Jacobson, 1913, Käfer Russlands, v. 2, p. 896; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 14.

Lyctoxylon serichispidum Kiesen., 1879, Deut. Ent. Ztschr. 23: 319; Reitter, 1880, Ent. Monatsbl., p. 88.

Head slightly declivous, slightly narrower than pronotum; vertex convex, deeply punctate; punctations separate; pubescence consisting of short, fine hair and short, thick hair on disk, and clumps of erect, thick, yellowish hairs, 1 clump over each eye on protuberance or supraorbital tubercle and clump on each frontal lobe and postclypeal lobe; vertex sloping to suleate epicranial suture and shiny postclypeus; labrum truncately obcordate; mandibles with median patch of curvate hairs on outer margin; antennae one-fifth longer than pronotum; antennal club two-fifths length of entire antenna; each segment of club narrowly elongate and subequal in length; segments of funicle lacking large, squamous hairs.

Pronotum slightly wider than long, slightly narrower in width than elytra; anterior margin arcuate, slightly reflected; anterior angles acute; sides sinuate, slightly convergent; posterior angles acute, prominent; disk convex with shallow, broad median fovea; small, deep, longitudinal canaliculation at posterior margin of pronotum; pronotum outlined with short, thick, truncate,

curvate hairs; prothoracic coxae widely separated by almost width of coxal cavity; inner tibial spur prominent, cultriform, extending to apex of third tarsal segment; outer tibial spur subcultriform, prominent, but not so large as inner spur.

Elytra twice as long as wide, sides subparallel; pubescence consisting of short, semierect, truncately spatulate hairs appearing in confused pattern, actually arranged seriately between rows of large, circular punctations.

Abdomen dull; fifth abdominal sternite of female with tufts of long, silken hairs on median section of apical margin; male with short tufts of hairs on each side of median line.

Length 1.5 to 2 mm.

Type locality.—Species described from specimens from India and Japan.

Distribution.—This species is apparently oriental in distribution. It may have become established in Panama.

Material examined.—(21 specimens).

LOUSIANA: New Orleans, October 23, 1941, from Netherlands East Indies in bamboo.
NEW JERSEY: Red Bank, July 16, 1897, (F. F. Coleman), in Japanese cane.
NEW YORK: New York (?), from Baatua, Hainan Island.
OREGON: Portland, October 4, 1940, from China or Japan in split bamboo.
PENNSYLVANIA: Philadelphia, August 2, 1934, (Kisliuk), from British Isles in casewood.
TEXAS: Galveston, May 15, 1942, from Java, in dry, split bamboo.
VIRGINIA: Norfolk, May 16, 1941, from Java in bamboo.
PANAMA: Ancon, Canal Zone, May 29, 1928, (J. Zetek), in bamboo.

Genus *Trogoxylon* LeConte[11]

Trogoxylon LeConte, 1861, Smithsn. Inst. Misc. Collect. 3, art. III, pt. 1, p. 209; 1866, ibid. 6, art. IV, pt. 1, p. 104; Seidlitz, 1875, Fauna Baltica, Käfer, p. 160; Reitter, 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 195; 1879, ibid. 29: 99; LeConte and Horn, 1883, Smithsn. Inst. Misc. Collect. 26, art. IV, p. 229; Reitter, 1885, Best.-Tab. Europ. Coleopt. (ed. 2), v. 1, p. 42; Casey, 1890, N. Y. Acad. Sci. Ann. 5: 324; Seidlitz, 1891, Fauna Baltica, Käfer, (ed. 2), p. 234; 1891, Fauna Transsylvanica, Käfer, p. 249; Schilsky, 1899, *in* Küster and Kraatz, Käfer Europas, v. 36, p. CCC; Reitter, 1911, Fauna Germanica, v. 3, pp. 96–97; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 116–117; Jacobson, 1913, Käfer Russlands, v. 2, p. 896; Lesne, 1921, Soc. Ent. de France Bul., pp. 228–231; 1924, *in* Encyclopédie Ent. III, pp. 100–101; 1938, *in* Junk, Coleopt. Cat., pt. 161, pp. 14–15; Arnett, 1952, U. S. Bur. Ent. and Plant Quar. E–844, pp. 1–3.

Head erect to declivous, narrower than pronotum; vertex slightly convex, punctate; pubescence varying from short, thick hairs to fine, golden hairs; labrum emarginate; mentum angular rounded to rounded; frontal lobes varying from unelevated to elevated; head appearing nontuberculate, bituberculate, or when tubercle is present over eyes trituberculate; antennae slightly shorter than pronotum; basal 2 segments enlarged, shorter, or equal to club in length; mandibles with outer margin slightly sinuate, bearing fringe of hairs; base not expanded leaflike.

Pronotum quadrate to slightly broader than long; disk punctate; pubescence thick, short, erect setae to recumbent, fine, silky hairs; disk convex to slightly impressed; anterior angles acute, prominently acute, rounded; sides straight, sinuate, or convergent to acute posterior angles; prothoracic coxae widely separated, but prosternal lobe not so wide as coxal cavity; inner tibial spur well developed; femur of metathoracic leg enlarged, compressed, subglobose.

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[11] Trogoxylon, Τρωγω—Trogo, to gnaw, nibble, munch; ξυλος—xylos, referring to wood, lignum.

Elytra approximately twice as wide as long; punctations confused or subseriated; pubescence confused, consisting of long, fine, recumbent hairs, or short, thick, erect setae.

Abdomen usually shiny, though finely punctate; first sternite longer than following 2 combined; fifth sternite bearing tufts or fringes of long, silky hairs.

Type species.—*Xylotrogus parallelopipedus* Melsh., designated by LeConte (*94*) when he erected the genus. He differentiated *Trogoxylon* from *Lyctus* F. on the character of the anterior tibia, with the outer apical angle not prolonged. Though this character alone would hardly be sufficient for the erection of a separate genus, as pointed out by Arnett (*5*), LeConte's designation of a genotype provides a basis for delineation. Casey (*26*) differentiated *Trogoxylon* from *Lyctus* on the basis of "anterior coxae very widely separated." In his next publication (*27*) he decided that this character was not constant, and placed *Trogoxylon* as a synonym of *Lyctus*. Lesne (*117*) evidently did not concur with Casey, as he grouped 5 species together in the genus *Trogoxylon*, and erected the tribe Trogoxylini. He believed that the Trogoxylini had undergone a more advanced development than the Lyctini, and formed a very gradual series linking the different types.

The characteristic enlargement of the femur of the metathoracic leg and confused pubescence of the elytra should serve to separate this genus from *Lyctus* and justify the generic position.

Key to New World Species of *Trogoxylon* [12]

1. Pubescence of head, pronotum, and elytra with fine, silky hairs..... 2
   Pubescence of head, pronotum, and elytra with short, thick, jagged setae .....*punctatum* LeC.
2. Vertex without tubercle or protuberance over inner margin of eye.. 3
   Vertex with distinct tubercle over eye.....*impressum* (Com.)
3. Postclypeal and frontal lobes level, not strongly reflexed..... 4
   Postclypeal and frontal lobes strongly, sharply reflexed upward, appearing bituberculate .....*prostomoides* (Gorh.)
4. Pronotum shiny, quadrate; anterior angles acutely rounded; disk convex; punctations widely separated; antennal segments thick, gradually expanding from seventh segment through antennal club..... 5
   Pronotum dull, slightly longer than broad; anterior angles prominent, sharply acute; disk with shallow median impression; punctations close, subreticulate; antennal club broadening abruptly from 10th segment.....*parallelopipedum* (Melsh.)
5. Mentum with median fovea; metasternum with shallow median groove .....*caseyi* Lesne
   Mentum without median fovea; metasternum without shallow median groove .....*aequale* (Woll.)

Trogoxylon aequale (Wollaston)

(Pl. XI, 1–7)

Lyctus aequalis Woll., 1867, Coleopt. Hesperidum, p. 111; Lesne, 1909, Paris Mus. d'Hist. Nat. Bul. 15, p. 347; 1921, Assoc. Franç. pour l'Avanc. des Sci., 45th Sess., Rouen, p. 638.

Lyctus californicus Csy., 1891, N. Y. Acad. Sci. Ann. 6: 13–14; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 118, 121; Lesne, 1921, Soc. Ent. de

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[12] *T. rectangulum* Lesne and *recticolle* Reitt. are not included in this key, since they are unknown to the author.

France Bul., p. 229; 1921, Assoc. Franç. pour l'Avanc. des Sci., 45th Sess., Rouen, p. 640.

Lyctus curtulus Csy., 1891, N. Y. Acad. Sci. Ann. 6: 13, 15; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, p. 118.

Trogoxylon aequale (Woll.) Lesne, 1924, *in* Encyclopédie Ent. III, p. 102; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 15.

Trogoxylon californicum (Csy.) Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 15.

T. aequale can be distinguished by the acutely rounded prothoracic anterior angles, the absence of a median metasternal groove, and the lack of a median fovea of the mentum.

Head declivous, narrower than pronotum; vertex flat, reticulopunctate; punctations shallow and elongate; pubescence short, fine, golden; frontal lobes contiguous and continuous with postclypeal lobes; vertex forming continuous plane from margin of pronotum to labrum; labrum emarginate and fringed with long hairs; male submentum with beard at apex; antennae shorter than pronotum; basal 2 segments enlarged, but shorter than antennal club; club one-fourth length of complete antennae; segments of club subequal in length and width, last segment rounded at apex; mandibles with sinuate outer margin, bearing thick, curved hairs two-thirds distance from base.

Pronotum as wide as long, widest portion narrower than widest portion of elytra; anterior margin rounded; anterior angles acutely rounded; sides convergent to acute posterior angles; disk convex, punctate; punctations granulose and distinctly separated, covered with recumbent, long, silky, golden hairs; narrow, longitudinal median canaliculation extending up from base one-third length of pronotum; prothoracic coxae widely separated; inner tibial spur well developed, extending to apex of second tarsal segment; outer tibial spur pointed, not prominent.

Elytra approximately 2 times as long as wide, widening slightly posteriorly; pubescence confused, recumbent, fine, golden, silky; punctations elongate, striated.

Abdomen finely rugose; fifth sternite of female deeply rounded, with median tuft of hair divided to form 2 triangular tufts on either side of median line; male with fringe of hairs entirely around margin of fifth sternite; margin broadly rounded.

Length variable, 2.2 to 2.7 mm.

Type locality.—Of *aequale*, Cape Verde, described from specimens from San Antonio and San Iago from beneath bark of a felled fig tree (*Ficus* sp.); of *californicum*, from Fort Yuma, Calif., (H. F. Wickham); of *curtulum*, from California.

I have placed *californicum* in synonymy with *aequale* after comparison of Casey's types with specimens of *aequale* determined by Lesne. Casey's descriptions and types of *californicum* and *curtulum* were checked, and though it is possible to detect a slight difference between the 2 types, the characters do not hold up when a series is examined. Apparently confusion and difficulties of identification exist between the 2 supposed species by other determiners, which more or less verify my beliefs on this species. Lesne (*117*), though not having the type of *californicum*, judged from the description that it was very close to *aequale* or perhaps even identical. The characters described for *curtulum* do not hold up in a series. The inner tibial spur of the prothoracic leg is rather prominent, whereas the outer, though not prominent, is still well developed. The "distinctly striate" elytra in *californicum* vary from striate to confused in a series of reared specimens. The antennal difference is apparent in the type specimens, but fades away when a number of specimens are examined.

Distribution.—*T. aequale* apparently is a tropical species, occurring in both the neotropical as well as the Ethiopian regions. Lesne (*108*) believed that this insect might have been brought to the Americas during the slave traffic and that it has become established and has extended its range. It has been described from Brazil, Cape Verde, Central America, Congo, Cuba, French Guinea, Hawaii, Mexico, Philippines, and Santo Domingo.

Material examined.—(241 specimens).

ARIZONA: Yuma, August 1924, (A. Fenyes).
MARYLAND: Baltimore, October 1952, (E. J. Gerberg), from Mexico in bamboo baskets; October 1952, (E. J. Gerberg), in ash furniture.
NEW JERSEY: Hoboken, September 1944, (E. A. Chapin), from Mexico in bamboo (*Arundinaria longifolia*).
NEW YORK: New York, from Guatemala in primavera log.
OHIO: Cincinnati, December 20, 1915, (A. C. Burrill), from Congo in chair.
TEXAS: Brownsville, (H. S. Barber), from *Vachellia farnesia, Acacia berlandieri, Parkinsonia* sp.; Devils River, May 5, 1907, (F. C. Pratt); Montell, November 12, 1907, (W. F. Fiske), from *Mimosa* sp.; Round Mountain, from fig wood; San Antonio, March 11, 1911, from mesquite; June 20, 1911, from *Prosopis juliflora;* April 22, 1922, (W. F. Fiske), from *Celtis* sp.
BRAZIL: Bahia, 1909, (A. Grouvelle), from tobacco.
CUBA: Habana, October 1943, (S. C. Bruner), from *Bucida buceras.*
GUATEMALA: Trece Aguas, April 1904, (H. S. Barber and E. A. Schwarz), from cacao.
MEXICO: Nogales, Sonora, September 20, 1942; Victoria, October 1912, (E. A. Schwarz).

Trogoxylon caseyi Lesne

Lyctus rectangulum Csy., 1924, Mem. Coleopt. 11, p. 184, (homonym).
Trogoxylon caseyi Lesne, 1937, Soc. Ent. de France Bul. 42, p. 240, (nomen novum for *rectangulum*); 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 15.

T. caseyi can barely be distinguished from *aequale* (Woll). The only difference appears to be a small median fovea on the posterior margin of the mentum and a shallow median groove on the metasternum of *caseyi.*

Head barely declivous, narrower than pronotum; vertex flat; punctations deep, large, elongate; pubescence short, fine, golden, recumbent; frontal lobes contiguous and continuous with postclypeal lobes; vertex roundly sloping to epicranial suture; postclypeus curved down; labrum recurved, emarginate, fringed with long hairs; antennae shorter than pronotum; basal 2 segments enlarged, but shorter than antennal club; club one-fourth length of complete antennae; segments of club subequal in length and width, last segment rounded at apex; mandibles with sinuate outer margin bearing thick, curved hairs; outer margin dorsal side of mandibles with rounded knob.

Pronotum as wide as long, widest portion narrower than widest portion of elytra; anterior angles acutely rounded; sides straight, convergent to acute posterior angles; disk convex, punctate; punctations large, distinctly separated, covered with long, recumbent, silky, golden hairs; narrow, longitudinal, deep median canaliculation extending up from one-fourth length of pronotum, continuing up as shallow, glabrous groove, to one-third from apex, to broad, regularly punctate, and hirsute Y; prothoracic coxae widely separated; inner tibial spur well developed, outer spur not prominent.

Elytra approximately 2¼ times as long as wide, widening slightly posteriorly; pubescence confused, recumbent, fine, golden, silky; punctations elongate, striated.

Abdomen finely rugose; fifth sternite of female deeply rounded, with median tuft of hair divided to form 2 triangular tufts on either side of median line.

Length 2.6 to 2.8 mm.

Type locality.—Brownsville, Tex., (Wickham); type located in the Casey collection of the United States National Museum, Washington, D. C.

Distribution.—The only specimens known are the types from Texas.

Material examined.—(7 specimens).

TEXAS: Brownsville, (Wickham).

Trogoxylon impressum (Comolli)

(Pl. XI, 8–16)

Lyctus impressus Com., 1837, Coleopt. Nov. Novoc., p. 40; Jacquelin-duVal, 1859–63, Genera Coléopt. Europe, v. 3, pl. 57, fig. 283; Tournier, 1874, Pet. Nouv. Ent. 6: 412; Seidlitz, 1875, Fauna Baltica, Käfer, p. 160; Kiesenwetter, 1877, *in* Erichson, Naturgesch. Ins. Deut., Coleopt., v. 5, p. 17; Reitter, 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 198; 1879, ibid. 29: 100; 1885, Best.-Tab. Europ. Coleopt. (ed. 2), v. 1, p. 44; Seidlitz, 1891, Fauna Baltica, Käfer, (ed. 2), p. 234; 1891, Fauna Transsylvanica, Käfer, p. 249; Schilsky, 1899, *in* Küster and Kraatz, Käfer Europas, v. 36, p. 70; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 117, 121; Reitter, 1911, Fauna Germanica, v. 3, p. 97, pl. 120, fig. 15; Jacobson, 1913, Käfer Russlands, v. 2, p. 896; Lesne, 1921, Soc. Ent. de France Bul., p. 231; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 15; Arnett, 1952, U. S. Bur. Ent. and Plant Quar. E–844, pp. 2–3.

Lyctus laevipennis Fald., 1837, Soc. Nat. de Moscou Nouv. Mém. 5, p. 256; Tournier, 1874, Pet. Nouv. Ent. 6: 412; Reitter, 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 199, (places species in synonymy).

Lyctus castaneous Perr., 1837, *in* Dejean, Cat. des Coléopt. (ed. 3), p. 338, (nomen nudum).

Lyctus glabratus Villa, 1837, *in* Dejean, Cat. des Coléopt. (ed. 3), p. 338, (nomen nudum).

Lyctus laevis Galeazzi, 1854, Coleopt. Europae, p. 64; Jacobson, 1913, Käfer Russlands, v. 2, p. 896.

Lyctus impressus var. *capitalis* Schauf., 1879, Nunquam Otiosus, v. 3, p. 534; Schilsky, 1899, *in* Küster and Kraatz, Käfer Europas, v. 36, p. 70.

Trogoxylon impressum (Com.) Reitter, 1885, Best.-Tab. Europ. Coleopt. (ed. 2), v. 1, p. 44; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 15.

T. impressum can be readily distinguished from all other species of the genus by the presence of a distinct tubercle over the eyes.

Head erect, narrower than pronotum; vertex barely convex, rugose, with short, golden hairs; lateral margins of vertex adjacent to inner margin of eye, forming pointed protuberance over eye; frontal ridge as well as postclypeus elevated into pointed protuberances, thus appearing as 3 tubercles on each side of head; labrum deeply obcordate; mandibles with single tooth; antennae as long as pronotum.

Pronotum subquadrate, with deep, broad, longitudinal median fovea, branching at center to form Y; disk densely punctate; anterior angles acute, reflexed; sides subparallel, finely denticulate, slightly sinuate, and convergent toward acute posterior angles; pronotum narrower than elytra; prosternal coxae separated; inner tibial spur small, outer tibial spur appearing as mere acute elongation of tibia.

Elytra twice as long as wide, sides slightly wider in median area; punctations circular, shallow, confused, covered with fine, golden pubescence.

Abdomen with dark lateral margins on sternum; fifth abdominal sternite of male with regular, long, silky hairs; fifth sternite of female with 2 whorls of long, thick, curly hairs, apical margin of fifth sternite reflexed.

Length 2.75 to 4.50 mm.

Type locality.—Novocomo, Italy.

Distribution.—Apparently in the Mediterranean area of the palaearctic region.

Material examined.—(11 specimens).

NEW YORK: New York, May 27, 1938, from Turkey in licorice roots; Yonkers, June 5, 1928, (C. S. Reed), from France.

Trogoxylon parallelopipedum (Melsheimer)

(Pls. XII, 1–8, and XIV, 4)

Xylotrogus parallelopipedus Melsh., 1846, Acad. Nat. Sci. Phila. Proc. 2: 112–113.

Trogoxylon parallelopipedum (Melsh.) LeConte, 1861, Smithsn. Inst. Misc. Collect. 3, art. III, pt. 1, p. 209; LeConte and Horn, 1883, ibid. 26, art. IV, p. 229; Lesne, 1921, Soc. Ent. de France Bul., p. 230; Parkin, 1934, Ann. Appl. Biol. 21 (3): 500; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 16.

Lyctus parallelopipedus (Melsh.) Casey, 1891, N. Y. Acad. Sci. Ann. 6: 13; Blatchley, 1910, Ind. Dept. Geol. and Nat. Resources Bul. 1, pp. 891–892; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 118, 121–122; Leonard, 1928, N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, p. 416.

T. parallelopipedum can be distinguished by the prominent, acute, pronotal anterior angles; the rounded, depressed postclypeus; and the abruptly expanded antennal club.

Head slightly declivous, slightly narrower than pronotum; vertex slightly convex, with large, deep, elongate punctations, subreticulate; pubescence consisting of short, fine, golden hairs; frontal lobes sloping, slightly depressed posteriorly; epicranal suture deep, distinct, rounded; postclypeus concave, separated from frontal lobes at lateral lobes by shallow notch; labrum sloping vertically, bilobed; posterior and lateral margins of mentum of male with long hairs about twice length of mentum, anteriorly recurved; in female no hairs on posterior margin, but shorter (subequal in length to mentum) hairs on lateral margins; antennae slightly shorter than pronotum; basal 2 segments enlarged, equal in length to club; penultimate segment of club shorter and slightly broader than last segment; apex of last segment obtuse; club arising rather abruptly from 10th segment; mandibles with outer margin slightly sinuate, with light fringe of hairs.

Pronotum slightly broader than long, subequal in width to elytra at its base; disk closely and regularly punctate, subreticulate, hirsute, canalication at posterior quarter, blending into shallow median impression, which in turn divides to form faintly impressed Y; anterior margin arcuate; anterior angles acute; sides sinuate, converging to acute posterior angles; prothoracic coxae widely separated; inner tibial spur well developed; outer tibial spur short, blunt.

Elytra approximately twice as long as wide; pubescence fine, golden, confused; side margins subparallel, broadening slightly posteriorly.

Abdomen finely rugulose, with widely spaced, shallow punctations; fifth sternite of male and female with triangular tufts of hairs on either side of median line at posterior margin.

Length 2.5 to 4.25 mm.

Type locality.—Pennsylvania. The holotype is probably lost. A specimen in the LeConte collection at the Museum of Comparative Zoology, Cambridge, Mass., is labeled "D. C."

Distribution.—Nearctic, occurring throughout the United States. Leonard (*101*) records it from Buffalo, N. Y., in black walnut lumber and from Long Island. Blatchley (*17*) records it from Orange and Perry Counties in Indiana, boring into trunks of living honeylocust (*Gleditsia triacanthos*).

Material examined.—(62 specimens).

ARKANSAS: Catalpa Springs.
DISTRICT OF COLUMBIA: Washington, May 19, 1896, from hickory barrel.
FLORIDA: Crescent City; Orlando, July 1, 1913, from bamboo.

GEORGIA: Athens, February 27, 1913, (W. F. Fiske), from *Diospyros virginiana.*
ILLINOIS: Chicago, September 8, 1916, from *Quercus* sp.; Moline, August 24, 1916, from *Quercus* sp.; July 13, 1918, from *Hicoria* sp.
IOWA: Iowa City, June 23, 1898, (Wickham).
KANSAS: Topeka, (Popenoe).
LOUISIANA: Baton Rouge, on Osage orange.
OHIO: Cincinnati, June.
PENNSYLVANIA: Allegheny County.
TEXAS: Brownsville, (H. S. Barber), on *Vachellia farnesiana;* Columbus; San Antonio, May 26, 1918, (T. E. Snyder), from *Prosopis juliflora.*

Trogoxylon prostomoides (Gorham)

(Pl. XII, 9–15)

Lyctus prostomoides Gorh., 1883, Biol. Centrali-Americana, Coleopt., v. 3, pt. 2, p. 212, sup. p. 352; Lesne, 1921, Soc. Ent. de France Bul., pp. 229, 231; 1921, Assoc. Franç. pour l'Avanc. des Sci., 45th Sess., Rouen, p. 640; Arnett, 1952, U. S. Bur. Ent. and Plant Quar. E–844, p. 2.
Trogoxylon prostomoides (Gorh.) Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 16.

T. prostomoides can be distinguished by its upturned postclypeal lobes and frontal lobes, producing a bituberculate effect, and the acutely rounded, slightly prominent anterior angles of the pronotum.

Head erect, slightly narrower than pronotum; vertex barely convex, punctate; punctations distinctly separate, granulose, each punctation with single short, golden hair; vertex sloping to epicranial suture; postclypeus continuing slope medianly; frontal lobes elevated, upturned, and paralleled by lateral lobes of postclypeus, thus forming 2 tubercles on either side of head anterior to eyes; labrum emarginate; antennae shorter than pronotum; basal 2 segments enlarged, but much shorter than antennal club; penultimate segment of club shorter than apical segment; mandibles with outer margin slightly arcuate.

Pronotum narrower than elytra, slightly broader than long, truncately arcuate; anterior angles acute; sides sinuate, minutely denticulate; posterior angles slightly reflexed, acute; disk punctate; punctations distinct, circular, well separated, each with short, fine, golden hair in confused pattern; small median canaliculation at posterior of longitudinal median impression, which divides to form Y two-thirds distance from posterior margin; prosternum practically glabrous, shiny; coxae separated; inner tibial spur extending past second tarsal segment, outer spur reduced to acute protuberance of tibia.

Elytra approximately 3 times as long as wide, sides parallel; pubescence fine, golden, short, confused.

Abdomen shiny; fifth sternite of female with median tuft of long, golden hairs; fifth sternite of male with short fringe of hairs on outer margin.

Length 2.5 to 4.0 mm.

Type locality.—El Tumbador, Guatemala.

Distribution.—Apparently Central American. Arnett (5) reports this species from Panama, Guatemala, Nicaragua, and Mexico.

Material examined.—(49 specimens).

DISTRICT OF COLUMBIA: Washington, May 1, 1946, from Costa Rica in wooden toy.
MISSISSIPPI: Clarksdale, March 12, 1946, (F. A. Smith), from Mexico in furniture.
TEXAS: Brownsville, May 8, 1940, from Mexico in dry herb wood.
COSTA RICA: Cartago, November 10, 1926; San José, November 15, 1925, (F. Nevermann).

MEXICO: Córdoba, May 8, 1908, (F. Knab); Cuernavaca, September 19, 1939, in bamboo; Guadalajara, May 1928, (F. H. Dixon), in furniture; Jalisco, cerca Lake Zacoalco, (L. Diguet), in *Leucaena esculenta*.

Trogoxylon punctatum LeConte
(Pl. XIII, 1–8)

Trogoxylon punctatum LeC., 1866, Smithsn. Inst. Misc. Collect. 6, art. IV, pt. 1, p. 104; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 16.
Lyctus punctatus (LeC.) Casey, 1891, N. Y. Acad. Sci. Ann. 6: 13, 15; Kraus, 1911, U. S. Bur. Ent. Tech. Ser. 20, pp. 117, 121; Leonard, 1928, N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, p. 416.

T. punctatum can be readily distinguished from all other species of *Trogoxylon* by the thick, short hairs of the head, prothorax, and elytra. The subequal segments of the antennal club will distinguish this species from members of the genus *Lyctoxylon*, which have a somewhat similar pubescence.

Head barely declivous, narrower than pronotum; vertex slightly convex, with comparatively large, deep, circular punctations; pubescence consisting of short, thick hairs, becoming short, thick, blunt, and jagged edged at lateral margins; postclypeus sloping in same plane as vertex, continuous and contiguous with frontal lobes; lateral lobes of postclypeus with thick, jagged setae; anterior margins of postclypeus concavely rounded; labrum emarginate; antennae slightly longer than pronotum.

Pronotum slightly broader than long, subequal in width to humeral angles of elytra, but narrower than width of elytra at median section; disk convex, distinctly punctate; punctations subcircular, each with short, thick setae, setae broadening apically to form jagged edge; anterior margin of pronotum arcuate; anterior angles acute, depressed; side margins roundly convergent toward acute posterior angles; prothoracic coxae separated; inner tibial spur well developed; outer tibial spur prominent, acutely pointed.

Elytra slightly less than twice as long as wide; side margins gradually broadening at median area, narrowing posteriorly; pubescence of elytra regular, each seta thick, short, erect, arcuate, with serrated edge.

Abdomen shiny, rugulose; fifth sternite of female broadly triangular, with median tufts of hair at posterior margins; male without median tufts of hair, fifth sternite broadly rounded.

Length 3.25 mm.

Type locality.—Cape San Lucas, Lower California, (John Xantus); type in LeConte collection at the Museum of Comparative Zoology, Cambridge, Mass.

Distribution.—Neotropical, apparently Central American.

Material examined.—(2 specimens).

LOWER CALIFORNIA: Santa Rosa.
MEXICO: Verdura, Sinaloa, April 19, 1941, from tomato fruit.

Trogoxylon rectangulum Lesne

Trogoxylon rectangulum Lesne, 1921, Soc. Ent. de France Bul., pp. 229–230; 1921, Assoc. Franç. pour l'Avanc. des Sci., 45th Sess., Rouen, p. 640; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 16.

Since specimens of *T. rectangulum* are unknown to the author, translation of the original description is appended. Lesne distinguished this species from *T. parallelopipedum* by the "clypeofrontal suture not at all sulciform. Pronotum transverse." He indicated a sulciform suture and elongated pronotum for *T. parallelopipedum*.

T. rectangulum, n. sp.—Length of body 2.6 mm.; maximum width of prothorax (anteriorly) about 0.7 mm.; body elongate, parallel, flattened, rufo-

brunneus, below very smooth and very shining; head above explanate, front anteriorly not at all sloping, sculptured with minute, sparse punctures, not at all deeply impressed; pronotum subquadrate, slightly transverse, hardly narrowed backward, marked with subdense, minute punctures; disk slightly impressed, sides with cultrate, very straight, short, rufous, densely fimbriated setae; anterior margin slightly arcuate; posterior subsinuate on both sides, with posterior angles geometrically straight; elytra shining, very finely, doubly punctate; punctures not at all seriate; base marginate near scutellum; prosternum very convex; intercoxal process subequal in width to adjacent coxae, apically sloping; metasternum posteriorly not at all impressed; mentum of male provided with erect setae joined together like brush at base.

Habitat Santo Domingo (Museum of Paris); type unique.

The requisite characters for this species are the following:

Dorsal aspect of head explanate, front not at all declivous anteriorly and separated from epistoma only by narrow suture, without any difference in level at this level; lateral angle of epistoma with group of convergent hairs simulating tooth.

Pronotum subquadrangular, slightly trapezoidal, very weakly narrowed backward; its sides remarkably rectilinear, each making sharp edge, very densely ciliate with short, reddish hairs, its angles right, especially posterior, which take on geometric regularity and which project backward little because of slight sinus on each side at posterior margin; disk of pronotum showing slight but wide bifurcate depression before and marked by punctures, rather dense, rather fine, not very deep.

Integument of elytra shining, without perceptible microsculpture; elytral punctation and pubescence diffuse, not at all seriate; former composed of 2 kinds of punctures, i.e., elongated pores and round dots finer than preceding and each giving rise to seta.

Prosternum very convex; intercoxal lobe sloping backward and nearly as wide as each adjacent coxa; no precoxal impressions on metasternum.

Trogoxylon recticolle Reitter

Trogoxylon recticolle Reitt., 1878, Zool.-Bot. Gesell. Wien, Verhandl. 28: 199; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 16.

Since specimens of this species are unknown to the author, translation of the original description follows.

Thorax quadrate, slightly longer than wide, with margins on side, anteriorly, and base straight; dorsum obsoletely canaliculate, with light, longitudinal median line; base distinctly marginate, marginal line externally abbreviated.

Ferruginous, rather shining, with short but distinct tawny pubescence; head and thorax densely punctulate; dorsal punctures distinct; elytra very finely and clearly punctulate; 3.2 mm. long.

La Plata (Col. Reitter).

Genus *Phyllyctus* Lesne

Phyllyctus Lesne, 1911, Paris Mus. d'Hist. Nat. Bul. 17, pp. 204, 206; Lesne, 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 18.

Mentum largely and briefly lobed in middle of anterior margin; labrum largely emarginate in front and almost bidentate; second segment of antennal club transverse, shorter and narrower than first segment; prothorax rimmed at angle to other at base; pronotum covered with extremely short, thick, perpendicularly erect hairs.

This description is based on a translation of Lesne's article (*112*), as specimens were not available to the author.

Type species.—Phyllyctus gounellei (Grouv.) (monobasic).

Phyllyctus gounellei (Grouvelle)

Tristaria gounellei Grouv., 1896, Soc. Ent. de France Ann. 65: 193–194.
Phyllyctus gounellei (Grouv.) Lesne, 1911, Paris Mus. d'Hist. Nat. Bul. 17, p. 206; 1938, *in* Junk, Coleopt. Cat., pt. 161, p. 18.

Since specimens of this species are unknown to the author, translation of the original description follows.

Oblong, subparallel, depressed, ferruginous; head and prothorax infuscate, densely and deeply punctate, hardly pubescent; head transverse, not at all striate between eyes; prothorax as wide as head, transverse, sides ciliate, base marginate, disk longitudinally carinate; elytra pubescent, punctulate; punctures more obsolete toward apex; 3.5 mm. long.

Oblong, nearly parallel, depressed, faintly shining, nearly smooth on head and prothorax, pubescent on elytra, ferruginous, head and prothorax little darkened; antennae exceeding middle of prothorax lengthwise, rather thick; head transverse, densely punctate; pubescence more perceptible on anterior part and along inner margin of eyes, formed in former region by recumbent hairs and in latter by erect hairs quite visible in profile; prothorax transverse, as wide as head, little narrowed at base, densely and more strongly punctate than head: lateral margins ciliate; disk little depressed in basal part, longitudinally carinate in that region, base edged; scutellum in form of reverse trapezoid; elytra hardly wider than prothorax, more than 3 times as long as latter, rounded together at apex, pubescent, punctate, nearly smooth toward apex.

Length 3.4 to 5 mm.

Type locality.—Cidade de Condeúba, Brazil, (E. Gounelle); type located in Museum of Natural History, Paris, France.

Selected References [13]

(1) ALSTON, A. M.
1922. ON THE YOUNG LARVAE OF LYCTUS BRUNNEUS STEPH. Ann. Appl. Biol. 9: 187–196.

(2) ———
1923. ON THE METHOD OF OVIPOSITION AND THE EGG OF LYCTUS BRUNNEUS STEPH. Linn. Soc. London, Jour., Zool. 35 (234): 217–227.

(3) ———
1923. ON THE GENITAL SYSTEM OF LYCTUS BRUNNEUS STEPH., WITH A NOTE ON L. LINEARIS GOEZE. Linn. Soc. London, Jour., Zool. 35 (238): 581–597, illus.

(4) ANDERSON, W. H.
1939. A KEY TO THE LARVAL BOSTRICHIDAE IN THE UNITED STATES NATIONAL MUSEUM (COLEOPTERA). Wash. Acad. Sci. Jour. 29: 382–391.

(5) ARNETT, R. H., JR.
1952. NOTES ON LYCTIDAE (COLEOPTERA). U. S. Bur. Ent. and Plant Quar. E-844, pp. 1–4.

(6) ARROW, G. J.
1904. NOTES ON TWO SPECIES OF COLEOPTERA INTRODUCED INTO EUROPE. Ent. Monthly Mag. 40: 35–36.

(7) BACH, M.
1851. KÄFERFAUNA FÜR NORD UND MITTELDEUTSCHLAND. V. 1, pp. 246–247. Coblenz.

(8) BASILEWSKY, P.
1952. LES BOSTRYCHIDES DU CONGO BELGE. Rev. de Zool. et de Bot. Africaines 46: 81–150.

(9) BEESON, D. F. C., and BHATIA, B. M.
1937. ON THE BIOLOGY OF THE BOSTRYCHIDAE. Indian Forest Rec. New Ser., Ent. 2, pt. 12, pp 223–323, illus.

(10) ——— and BHATIA, B. M.
1941. FOREST INSECTS. Pp. 69–83. Dehra Dun.

(11) BILLBERG, G. J.
1820. ENUMERATIO INSECTORUM IN MUSEO BILLBERG. P. 48. Stockholm.

(12) BLACKBURN, T.
1888. FURTHER NOTES ON AUSTRALIAN COLEOPTERA, WITH DESCRIPTIONS OF NEW SPECIES. Roy. Soc. So. Austral. Trans. and Proc. 10: 265.

(13) ——— and SHARP, D.
1885. SYSTEMATIC CATALOGUE OF THE COLEOPTERA OF THE HAWAIIAN ISLANDS. Roy. Dublin Soc. Sci. Trans. (ser. 2) 3: 141, 245.

(14) BLACKWELDER, R. E.
1945. CHECKLIST OF THE COLEOPTEROUS INSECTS OF MEXICO, CENTRAL AMERICA, THE WEST INDIES AND SOUTH AMERICA. Pt. 3. U. S. Natl. Mus. Bul. 195, pp. 400–401.

(15) BLANCHARD, E.
1845. HISTOIRE DES INSECTES. V. 2, p. 93. Paris.

(16) ———
1851. *In* Gay, C., Historia Fisica y Politica de Chile. Fauna Chilena. V. 5, p. 438, illus. Paris.

(17) BLATCHLEY, W. S.
1910. COLEOPTERA OF INDIANA. Ind. Dept. Geol. and Nat. Resources Bul. 1, pp. 891–892.

[13] Partial pagination is given when only a part of the text refers to lyctids and total pagination when the entire text is applicable. References 83 and 150 have not been seen by the author.

(18) BOSQ, J. M.
1934. PRIMERA LISTA DE LOS COLEOPTEROS DE LA REPUBLICA ARGENTINA DAÑINOS A LA AGRICULTURA. Argentina Min. de Agr. Bol. 36, pt. 4, p. 324.
(19) ———
1942. SEGUNDA LISTA DE COLEOPTEROS DE LA REPUBLICA ARGENTINA DAÑINOS A LA AGRICULTURA. Ingenieria Agron. 4 (19): 49.
(20) BÖVING, A. G., and CRAIGHEAD, F. C.
1931. AN ILLUSTRATED SYNOPSIS OF THE PRINCIPAL LARVAL FORMS OF THE ORDER COLEOPTERA. Ent. Amer. (n. s.) 11: 1–351.
(21) BRADLEY, J. C.
1930. A MANUAL OF THE GENERA OF BEETLES OF AMERICA NORTH OF MEXICO. Pp. 1–360. Ithaca, N. Y.
(22) BRIMLEY, C. S.
1938. THE INSECTS OF NORTH CAROLINA. P. 198. Raleigh.
(23) BROWNE, F. G.
1938. THE COMMON MALAYAN POWDER-POST BEETLE. Malayan Forester 7 (3): 107–120.
(24) BUREAU, L.
1900. LE LYCTE CANALICULE (LYCTUS CANALICULATUS FABR.) ET LES RAVAGES . . . Soc. Sci. Nat. Ouest France Bul. 10, pp. 169–201.
(25) CASEY, T. L.
1884. CONTRIBUTIONS TO THE DESCRIPTIVE AND SYSTEMATIC COLEOPTEROLOGY OF NORTH AMERICA. Pt. 2. Pp. 175–176. Philadelphia.
(26) ———
1890. COLEOPTEROLOGICAL NOTICES II. N. Y. Acad. Sci. Ann. 5: 324–325, 495–497.
(27) ———
1891. COLEOPTEROLOGICAL NOTICES III. N. Y. Acad. Sci. Ann. 6: 12–16.
(28) ———
1924. ADDITIONS TO THE NORTH AMERICAN COLEOPTERA. Mem. Coleoptera 11, pp. 183–184.
(29) CHEVROLAT, L. A. A.
1844. *In* Guérin-Méneville, F. E., Iconographie du Règne Animal. Insectes. Pp. 191–192, illus. Paris.
(30) CHITTENDEN, F. H.
1895. ON THE DISTRIBUTION OF CERTAIN IMPORTED BEETLES. Insect Life 7: 328.
(31) CHRISTIAN, M. B.
1940–41. BIOLOGY OF THE POWDER-POST BEETLES, LYCTUS PLANICOLLIS LECONTE AND LYCTUS PARALLELOPIPEDUS (MELSH.). La. Conserv. Rev. 9 (4): 56–59; 10 (1): 40–42.
(32) COLLART, A.
1934. NOTES DE CHASSE AU SUJET DES COLÉOPTÈRES DU CONGO BELGE. Soc. Ent. de Belg. Bul. 74, pp. 242–243.
(33) COMOLLI, A.
1837. DE COLEOPTERIS NOVIS AC RARIORIBUS MINUSVE COGNITIS PROVINCIAE NOVOCOMI. Pp. 40–42. Ticini.
(34) CRAIGHEAD, F. C.
1950. INSECT ENEMIES OF EASTERN FORESTS. U. S. Dept. Agr. Misc. Pub. 657, pp. 222–228.
(35) CROTCH, G. R.
1870. THE GENERA OF COLEOPTERA STUDIED CHRONOLOGICALLY (1735–1801). London Ent. Soc. Trans. 1870: 41–52.
(36) CROWSON, R. A.
1950–51. THE CLASSIFICATION OF THE FAMILIES OF BRITISH COLEOPTERA. Ent. Monthly Mag. 86: 149–171; 87: 147–156.
(37) DEJEAN, P. F. M. A.
1837. CATALOGUE DES COLÉOPTÈRES DE LA COLLECTION DE M. LE COMTE DEJEAN. Ed. 3, rev., p. 338. Paris.
(38) DEJONG, C.
1949. COLEOPTEROLOGISCHE NOTITIES II. 3. AANTASTING VAN HOUT DOOR LYCTUS BRUNNEUS STEPH. Tijdschr. v. Ent. 91: 32–36.

(39) DES GOZIS, M.
1881. NOTES. Soc. Ent. de France Ann. 1881: 135.
(40) ———
1886. RECHERCHES DE L'ESPECE TYPIQUE DE QUELQUE ANCIENS GENRE. Pp. 10–11. Montluçon.
(41) DEVILLE, J. S. C.
1935. CATALOGUE RAISONNE DES COLÉOPTÈRES DE FRANCE. Abeille 36: 253.
(42) DUFTSCHMID, K.
1825. FAUNA AUSTRIACA. V. 3, pp. 147–149. Linz and Leipzig.
(43) DUGES, E.
1883. METAMORPHOSES DU LYCTUS PLANICOLLIS LEC. Soc. Ent. de Belg. Ann. 27: 54–58.
(44) ERICHSON, W. F.
1845. NATURGESCHICHTE DER INSECTEN DEUTSCHLANDS. COLEOPTERA. V. 3, pp. 258, 287. Berlin.
(45) ———
1847. CONSPECTUS INSECTORUM COLEOPTERUM QUAE IN REPUBLICA PERUANA OBSERVATA SUNT. Arch. f. Naturgesch. 13: 88.
(46) EVERTS, J. E.
1899. COLEOPTERA NEERLANDICA. V. 1, pt. 2, pp. 564–566. Hague.
(47) FABRICIUS, J. C.
1792. ENTOMOLOGIA SYSTEMATICA. V. 1, pp. 502–505. Hafniae.
(48) ———
1801. SYSTEMA ELEUTHERATORUM. V. 2, pp. 562–563. Kiliae.
(49) FALDERMANN, F.
1837. FAUNA ENTOMOLOGICA TRANS-CAUCASICA. Pt. 2. Soc. Nat. de Moscou Nouv. Mém. 5, pp. 255–257.
(50) FALL, H. C.
1901. LIST OF THE COLEOPTERA OF SOUTHERN CALIFORNIA. Calif. Acad. Sci. Occas. Papers 8, p. 134.
(51) FAUVEL, A.
1889. LISTE DES COLÉOPTÈRES COMMUNS A L'EUROPE ET L'AMERIQUE DU NORD. Rev. Franç. d'Ent. 8: 147.
(52) ———
1904. FAUNE ANALYTIQUE DES COLÉOPTÈRES DE LA NOUVELLE-CALEDONIE. LYCTIDAE. Rev. Franç. d'Ent. 22 (6): 154–155.
(53) FISHER, R. C.
1928. LYCTUS POWDER-POST BEETLES. Forest Prod. Res. Bul. No. 2, pp. 1–46.
(54) ———
1933. SOME ASPECTS OF THE "LYCTUS" POWDER-POST BEETLE PROBLEM IN GREAT BRITAIN. Fifth Cong. Internatl. d'Ent., Paris, July 18–24, 1932, pt. 2, pp. 757–771.
(55) ——— CANN, F. R., and PARKIN, E. A.
1932. A SURVEY OF THE DAMAGE CAUSED BY INSECTS TO HARDWOOD TIMBERS IN GREAT BRITAIN. Forest Prod. Res. Bul. No. 16, pp. 1–27.
(56) FORBES, W. T. M.
1926. THE WING FOLDING PATTERNS OF THE COLEOPTERA N. Y. Ent. Soc. Jour. 34: 42–68, 91–139.
(57) FOURCROY, A. F.
1785. ENTOMOLOGIA PARISIENSIS. V. 1, p. 19. Paris.
(58) FROGATT, W. W.
1927. FOREST INSECTS AND TIMBER BORERS. Pp. 20, 68–74. Sydney, Australia.
(59) FURSOV, N. I.
1939. EINE NEUE GATTUNG UND 6 NEUE COLEOPTERENARTEN VON MITTELASIEN UND CAUCASUS. Soc. Nat. de Moscou Bul. (n. s.) 48, p. 89.
(60) GAHAN, C. J.
1946. FURNITURE BEETLES . . . Ed. 4, rev. Brit. Mus. Nat. Hist. Econ. Ser. 2, pp. 1–26. London.
(61) GALEAZZI, G.
1854. COLEOPTERA EUROPAE. P. 64. Milano.

(62) GANGLBAUER, L.
1903. SYSTEMATISCH-KOLEOPTEROLOGISCHE STUDIEN. München. Koleopterologische Ztschr. 1: 271–319.
(63) GARDNER, J. C. M.
1933. IMMATURE STAGES OF INDIAN COLEOPTERA (13). (BOSTRYCHIDAE). Indian Forest Rec., Ent. 18, pt. 9, pp. 1–19.
(64) GAY, F. J.
1935. OBSERVATIONS ON THE BIOLOGY OF LYCTUS BRUNNEUS STEPH. Austral. Jour. Zool. 1: 102–110.
(65) GEMMINGER, M., and HAROLD, E. VON.
1869. CATALOGUS COLEOPTERORUM. V. 6, pp. 1793–1794. Munich.
(66) GEOFFROY, E. L.
1762. HISTOIRE ABRÉGÉE DES INSECTES QUI SE TROUVENT AUX ENVIRONS DE PARIS. V. 1, p. 103. Paris.
(67) GOEZE, J. A. E.
1777. ENTOMOLOGISCHE BEYTRÄGE . . . V. 1, p. 148. Leipzig.
(68) GORHAM, H. S.
1883. MALACODERMATA. BIOLOGIA CENTRALI-AMERICANA. INSECTA, COLEOPTERA. V. 3, pt. 2, p. 212. London.
(69) GROUVELLE, A.
1896. NITIDULIDES, COLYDIIDES ET PARNIDES RECOLTES PAR M. E. GOUNELLE AU BRESIL. Soc. Ent. de France Ann. 65: 193–194.
(70) ———
1900. CLAVICORNES. Soc. Ent. de Belg. Ann. 44: 424.
(71) GUTFLEISCH, V.
1859. DIE KÄFER DEUTSCHLANDS. Pp. 405–406. Darmstadt.
(72) GYLLENHAL, L.
1813. INSECTA SUECICA (COLEOPTERA). V. 1, pt. 3, pp. 408–409. Scaris.
(73) HAMILTON, J.
1889. CATALOGUE OF THE COLEOPTERA . . . Amer. Ent. Soc. Trans. 16: 142.
(74) ———
1895. CATALOGUE OF THE COLEOPTERA OF SOUTHWESTERN PENNSYLVANIA . . . Amer. Ent. Soc. Trans. 22: 366.
(75) HELLWIG, J. C. L.
1792. DRITTE NACHRICHT VON NEUEN GATTUNGEN IM ENTOMOLOGISCHEN SYSTEM. Schneider, D. H., Neuestes Mag. 1 (4): 405.
(76) HENSHAW, S.
1885. LIST OF THE COLEOPTERA OF AMERICA, NORTH OF MEXICO. Amer. Ent. Soc. Trans. 12: 85.
(77) HERBST, J. F. W.
1783. KRITISCHES VERZEICHNESS MEINER INSEKTENSAMMLUNG. *In* Füessly, J. C., Archiv der Insectengeschichte. V. 4, p. 40, illus. Zürich.
(78) ———
1793. NATURSYSTEM ALLER BEKANNTEN IN UND AUSLANDISCHEN INSEKTEN. V. 5, pp. 26–27. Berlin.
(79) HEYDEN, L. F. J. D. VON, REITTER, E., and WEISE, J.
1906. CATALOGUS COLEOPTERUM EUROPAE, CAUCASI ET ARMENIAE ROSSIAE. P. 423. Paskau.
(80) HOPKINS, A. D.
1911. NOTES ON HABITS AND DISTRIBUTION, WITH LIST OF DESCRIBED SPECIES. *In* Kraus, E. J., U. S. Bur. Ent. Tech. Ser. 20, pp. 130–138.
(81) ——— and SNYDER, T. E.
1917. POWDER-POST DAMAGE BY LYCTUS BEETLES TO SEASONED HARDWOOD. U. S. Dept. Agr. Farmers' Bul. 778, pp. 1–20.
(82) HYSLOP, J. A.
1938. LOSSES OCCASIONED BY INSECTS, MITES, AND TICKS IN THE UNITED STATES. U. S. Bur. Ent. and Plant Quar. E–444, p. 43.

(83) JACOBSON, G. G.
1913. DIE KÄFER RUSSLANDS UND WESTEUROPAS. V. 2, pp. 895–896. St. Petersburg.
(84) JACQUELIN-DUVAL, P. N. C.
1859–63. GENERA DES COLÉOPTÈRES D'EUROPE. V. 3, pp. 234-235, illus. Paris.
(85) JOY, N. H.
1932. A PRACTICAL HANDBOOK OF BRITISH BEETLES. V. 1, p. 507; v. 2, p. 145. London.
(86) KIESENWETTER, E. A. H. VON.
1877. ANOBIIDAE AND CIOIDAE. *In* Erichson, W. F., Naturgeschichte der Insecten Deutschlands. Coleoptera. V. 5, pt. 1, pp. 11–18. Berlin.
(87) ———
1879. COLEOPTERA JAPONIAE COLLECTA A DOMINO LEWIS ET ALIIS. Deut. Ent. Ztschr. 23: 305–320.
(88) KOJIMA, T.
1932. BEITRAGE ZUR KENNTNIS VON LYCTUS LINEARIS GOEZE. Angew. Ent. Ztsch. 19: 325–356.
(89) KRAUS, E. J.
1911. TECHNICAL PAPERS ON MISCELLANEOUS FOREST INSECTS. III. A REVISION OF THE POWDER-POST BEETLES OF THE FAMILY LYCTIDAE OF THE UNITED STATES AND EUROPE. U. S. Bur. Ent. Tech. Ser. 20, pp. 111–129.
(90) LACORDAIRE, J. T.
1857. HISTOIRE NATURELLE DES INSECTES. GENERA DES COLÉOPTÈRES. V. 4, pp. 547–548. Paris.
(91) LATREILLE, P. A.
1803. HISTOIRE NATURELLE DES CRUSTACES ET DES INSECTES. V. 5, p. 253. Paris.
(92) ———
1807. GENERA CRUSTACEORUM ET INSECTORUM . . . V. 3, pp. 16–17. Paris.
(93) LECONTE, J. L.
1858. DESCRIPTIONS OF NEW SPECIES OF COLEOPTERA . . . Acad. Nat. Sci. Phila. Proc. 10: 74.
(94) ———
1861. CLASSIFICATION OF THE COLEOPTERA OF NORTH AMERICA. Smithsn. Inst. Misc. Collect. 3, art. III, pt. 1, pp. 208–209.
(95) ———
1866. NEW SPECIES OF NORTH AMERICAN COLEOPTERA. Smithsn. Inst. Misc. Collect. 6, art. IV, pt. 1, pp. 103–104.
(96) ——— and HORN, G. H.
1883. CLASSIFICATION OF THE COLEOPTERA OF NORTH AMERICA. Smithsn. Inst. Misc. Collect. 26, art. IV, p. 229.
(97) LEFROY, H. M., and HOWLETT, F. M.
1909. INDIAN INSECT LIFE. P. 313. Calcutta.
(98) LENG, C. W.
1920. CATALOGUE OF THE COLEOPTERA OF AMERICA, NORTH OF MEXICO. Pp. 245–246. Mount Vernon, N. Y.
(99) ——— and MUTCHLER, A. J.
1914. A PRELIMINARY LIST OF THE COLEOPTERA OF THE WEST INDIES AS RECORDED TO JAN. 1, 1914. Amer. Mus. Nat. Hist. Bul. 33, pp. 391–493.
(100) ——— and MUTCHLER, A. J.
1927. CATALOGUE OF THE COLEOPTERA OF AMERICA, NORTH OF MEXICO. Sup. 1, p. 38, Mount Vernon, N. Y.
(101) LEONARD, M. D.
1928. A LIST OF INSECTS OF NEW YORK. N. Y. (Cornell) Agr. Expt. Sta. Mem. 101, p. 416.
(102) LEPESME, P.
1944. LES COLÉOPTÈRES DES DENRÉES ALIMENTAIRES ET DES PRODUITS INDUSTRIELS ENTREPOSÉS. *In* Encyclopédie Entomologique. Ser. A, xxii, pp. 75–87. Paris.

(103) LEPESME, P.
1947. COLÉOPTÈRES DES ANTILLES. Faune de l'Empire Franç. VII: 194–199.

(104) ———
1947. LES INSECTES DES PALMIERS. P. 500. Paris.

(105) LESNE, P.
1898. SUR UN COLÉOPTÈRE NOUVEAU DE LA FAMILLE DES LYCTIDES. Paris Mus. d'Hist. Nat. Bul. 4, p. 139.

(106) ———
1907. UN LYCTUS AFRICAIN NOUVEAU. Soc. Ent. de France Bul., p. 302.

(107) ———
1908. NOTES SUR LES COLÉOPTÈRES TÉRÉDILES. 2. UN NOUVEAU LYCTIDE APPARENTE AU LYCTUS BRUNNEUS STEPH. Paris Mus. d'Hist. Nat. Bul. 14, pp. 356–358.

(108) ———
1909. NOTES . . . 3. LES LYCTIDES ET BOSTRYCHIDES DES ARCHIPELS ATLANTIQUES. Paris Mus. d'Hist. Nat. Bul. 15, pp. 347–350.

(109) ———
1910. NOTES SUR LES DIVERS LYCTIDES DU TYPE XYLOTROGUS STEPHENS. Soc. Ent. de France Bul., pp. 254–255.

(110) ———
1910. UN LYCTIDE NOUVEAU DE LA FAUNE INDIENNE. Soc. Ent. de France Bul., pp. 303–305.

(111) ———
1911. NOTES . . . 6. UN LYCTIDE PALÉARCTIQUE NOUVEAU. Paris Mus. d'Hist. Nat. Bul. 17, pp. 48–50.

(112) ———
1911. NOTES . . . 7. LES TRISTARIENS; LEUR AFFINITIES ZOOLOGIQUES. SYNOPSIS DU GROUPE. Paris Mus. d'Hist. Nat. Bul. 17, pp. 202–208.

(113) ———
1911. NOTES . . . 8. LYCTIDES NOUVEAU DU MEXIQUE. Paris Mus. d'Hist. Nat. Bul. 17, pp. 534–538.

(114) ———
1913. NOTES . . . 13. LES TRISTARIENS DU GENRE LYCTODERMA. Paris Mus. d'Hist. Nat. Bul. 19, pp. 562–565.

(115) ———
1914. NOTES . . . 14. LES LYCTIDES DE L'AFRIQUE AUSTRALE. Paris Mus. d'Hist. Nat. Bul. 20, pp. 332–335.

(116) ———
1916. NOTES . . . 15. VARIABILITÉ DE CERTAINS LYCTIDES DE L'AMERIQUE DU NORD. LES FORMES TYPIQUES DU GENRE LYCTUS. Paris Mus. d'Hist. Nat. Bul. 22, pp. 92–100.

(117) ———
1921. LES ESPECES TYPIQUES DE TROGOXYLON. POSITION SYSTÉMATIQUE DE SE GENRE. Soc. Ent. de France Bul., pp. 228–231.

(118) ———
1922. REGIME ET DÉGÂTS DES COLÉOPTÈRES XYLOPHAGES DU GENRE LYCTUS. Rev. de Bot. Appl. et d'Agr. Colon. 2: 418–420.

(119) ———
1924. LES COLÉOPTÈRES BOSTRYCHIDES DE L'AFRIQUE TROPICALE FRANÇAISE. *In* Encyclopédie Entomologique. III. Pp. 77–109. Paris.

(120) ———
1925. NOTULAE TEREDILIANAE. IV. CAPTURE OF LYCTUS VILLOSUS LESNE AUX ILES HAWAII. V. SUR LE LYCTUS AFRICANUS LESNE. *In* Encyclopédie Entomologique. Ser. B, Colcoptera. V. 1, pp. 31–32. Paris.

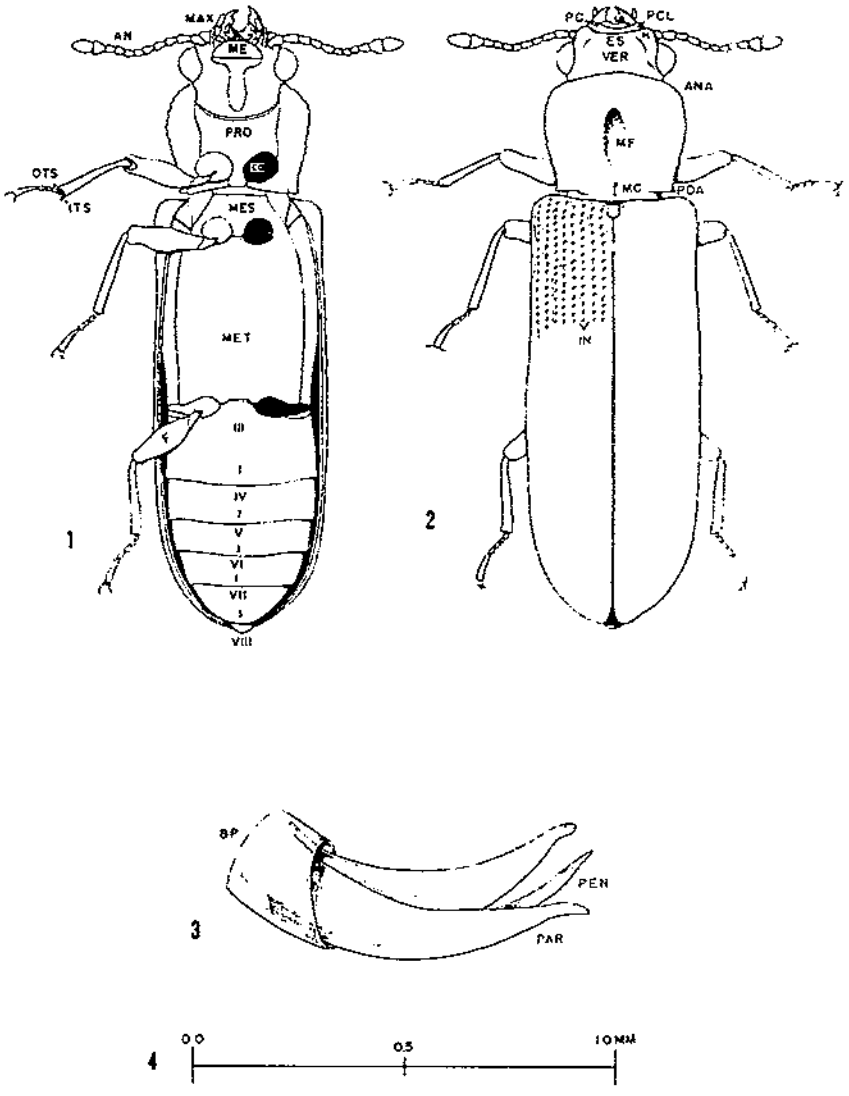
(121) ———
1931. NOTES . . . 20. DIAGNOSES DE BOSTRYCHIDES NOUVEAU FAISANT PARTIE DES COLLECTIONS DU MUSEUM. Paris Mus. d'Hist. Nat. Bul. (ser. 2) 3, pt. 1, pp. 96–99.

(122) LESNE, P.
1932. LES FORMES D'ADAPTATION AU COMMENSALISME CHEZ LES LYCTITES. *In* Société Entomologique de France, Livre du Centennaire. Pp. 619–627. Paris.
(123) ———
1932. NOTES . . . 22. DIAGNOSES DE BOSTRYCHIDES NOUVEAUX DE L'ASIA ORIENTALE. Paris Mus. d'Hist. Nat. Bul. (ser. 2) 4, pp. 654–655.
(124) ———
1932. RESULTS OF DR. E. MJÖBERGS SWEDISH SCIENTIFIC EXPEDITIONS TO AUSTRALIA (1910–1913) BOSTRYCHIDAE. Arkiv für Zool. 24 (14): 1–8.
(125) ———
1933. BOSTRYCHIDES NOUVEAUX DU CONGO BELGE ET DES RÉGIONS VOISINES. Rev. de Zool. et de Bot. Africaines 27 (1): 1–5.
(126) ———
1936. DIAGNOSES PRELIMINAIRES DE LYCTIDES ET BOSTRYCHIDES NOUVEAUX DE L'INDO ET L'AUSTRO-MALAISIE. Soc. Ent. de France Bul. 41, pp. 131–134, illus.
(127) ———
1937. BOSTRYCHIDES NOUVEAUX DES COLLECTIONS DU MUSÉUM. Paris Mus. d'Hist. Nat. Bul. (ser. 2) 9, pp. 319–325.
(128) ———
1937. NOTES RECTIFICATIVES ET SYNONYMIQUES SUR CERTAINS BOSTRYCHIDES. Soc. Ent. de France Bul. 42, p. 240.
(129) ———
1938. BOSTRYCHIDAE. *In* Junk, Coleopterorum Catalogus. Pt. 161, pp. 6–18. Berlin.
(130) LINNAEUS, C.
1767. SYSTEMA NATURAE. Ed. 12, v. 1, pt. 2, p. 573. Holmiae.
(131) MCKEOWN, K. C.
1949. AUSTRALIAN INSECTS. 36. COLEOPTERA–13. PHALACRIDAE, GEORYSSIDAE AND LYCTIDAE. Austral. Mus. Mag. 9 (11): 371–373.
(132) MARCHAL, C.
1888. FAMILLE DES LYCTIDES. Feuille des Jeunes Naturalistes 208: 50–51.
(133) MASTERS, G.
1886. CATALOGUE OF THE DESCRIBED COLEOPTERA OF AUSTRALIA. Pt. 4. Linn. Soc. N. S. Wales, Proc. (ser. 2) 10: 335.
(134) MELSHEIMER, F. E.
1846. DESCRIPTIONS OF NEW SPECIES OF COLEOPTERA OF THE UNITED STATES. Acad. Nat. Sci. Phila. Proc. 2: 112–113.
(135) MONTROUZIER, X.
1861. ESSAI SUR LA FAUNE ENTOMOLOGIQUE DE LA NOUVELLE CALEDONIE. Soc. Ent. de France Ann. (ser. 4) 1: 266.
(136) OLALQUIAGA-FAURE, G.
1945. INSECTOS DE LOS ENVASES DEL TE PROCEDENTE DE CEYLON Y EL PROBLEMA DE SU EXCLUSION. Agr. Tech. 5 (2): 219–221.
(137) OLIVIER, G. A.
1790. ENTOMOLOGIE OU, HISTORIE NATURELLE DES INSECTES. . . . COLÉOPTÈRES. V. 2, p. 7, illus. Paris.
(138) ———
1792. ENCYCLOPÉDIE MÉTHODIQUE, HISTOIRE NATURELLE, INSECTES. V. 5, p. 405. Paris.
(139) PANZER, G. W. F.
1793. FAUNAE INSECTORUM GERMANICAE. Fasc. 4, illus. Nürnberg.
(140) PARKIN, E. A.
1934. OBSERVATIONS ON THE BIOLOGY OF THE LYCTUS POWDER-POST BEETLES, WITH SPECIAL REFERENCE TO OVIPOSITION AND THE EGG. Ann. Appl. Biol. 21 (3): 495–518.
(141) PASCOE, F. P.
1866. ON THE COLYDIIDAE OF THE AMAZON VALLEY. Jour. Ent. 2: 97–98, illus.

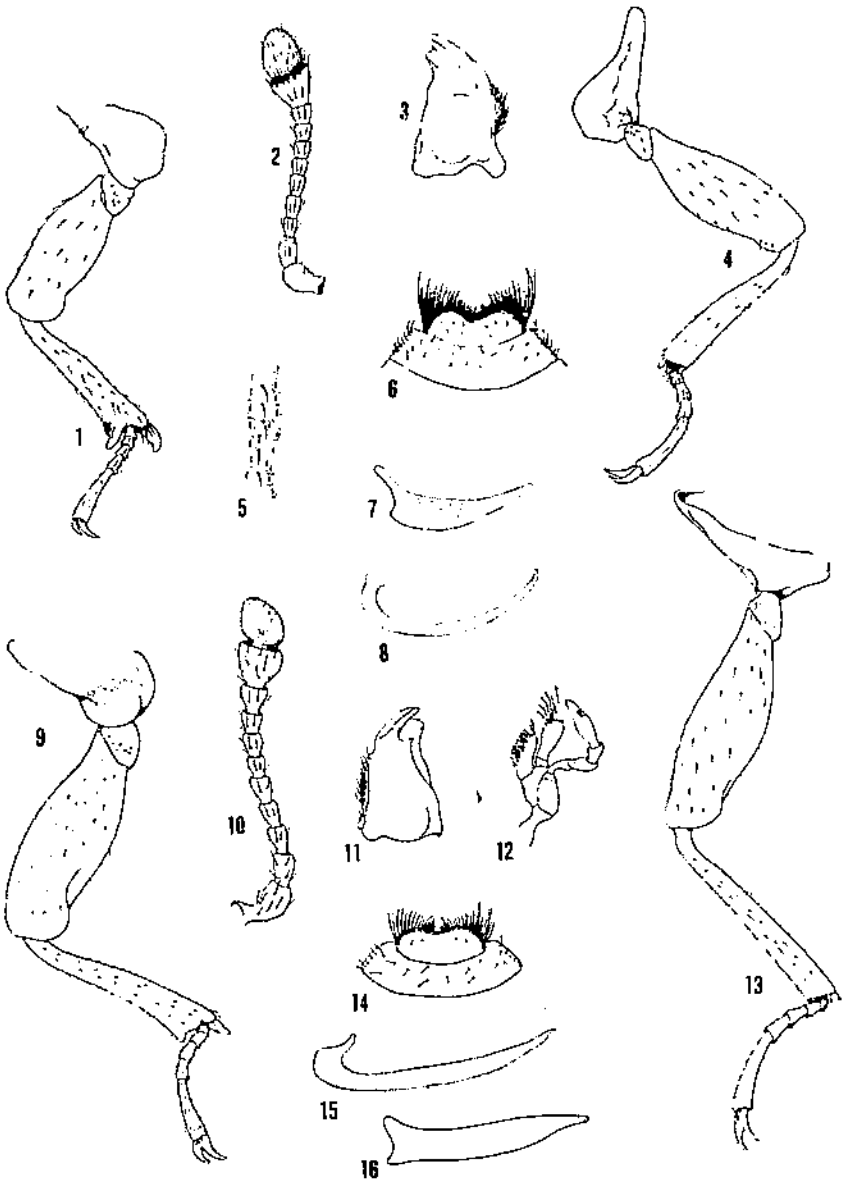
(142) PASCOE, F. P.
1866. ON THE COLYDIIDAE COLLECTED IN THE INDIAN ISLANDS BY MR. A. R. WALLACE. Jour. Ent. 2: 141–142, illus.
(143) PAYKULL, G. VON.
1800. FAUNA SUECICA. V. 3, pp. 326–334. Upsaliae.
(144) PHILIPPI, F.
1887. CATALOGO DE LOS COLEÓPTEROS DE CHILE. P. 105. Santiago.
(145) POLL, M.
1933. NOTE SUR LA CLASSIFICATION DES COLÉOPTÈRES. Soc. Ent. de Belg. Bul. et Ann. 73, pp. 55–67.
(146) REDTENBACHER, L.
1874. FAUNA AUSTRIACA, DIE KÄFER. Ed. 3, v. 1, p. 391. Wien.
(147) REITTER, E.
1878. BEITRAGE ZUR KENNTNISS AUSSER EUROPÄISCHER COLEOPTEREN. Stettin Ent. Ztg. 39: 320–322.
(148) ———
1878. BEITRAG ZUR KENNTNISS DER LYCTIDAE. Zool.-Bot. Gesell. Wien, Verhandl. 28: 195–199.
(149) ———
1879. BESTIMUNGS-TABELLEN DER EUROPÄISCHEN COLEOPTEREN. Zool.-Bot. Gesell. Wien, Verhandl. 29: 98–100.
(150) ———
1880. ENTOMOLOGISCHE MONATSBLÄTTER. P. 88. Berlin.
(151) ———
1911. FAUNA GERMANICA. V. 3, pp. 96–97. Stuttgart.
(152) SAMOUELLE, G.
1819. ENTOMOLOGISTS USEFUL COMPENDIUM . . . Pp. 206–208, 369. London.
(153) SCHAUFUSS, L. W.
1879. NUNQUAM OTIOSUS. MITTEILUNGEN AUS DEM MUSEUM VON DR. L. W. SCHAUFUSS. V. 3, p. 534. Dresden.
(154) SCHAUM, H. R.
1847. BEMERKUNGEN ÜBER ZWEIFELHAFTE KÄFER LINNES NACH SEINER SAMMLUNG. Stettin Ent. Ztg. 8: 318.
(155) ———
1862. CATALOGUS COLEOPTERUM EUROPAE. P. 68. Berlin.
(156) SCHEERPELTS, O.
1939. BESTIMMUNGSTABELLEN EUROPÄISCHER KÄFER. Koleopterologische Rundschau 25: 104.
(157) SCHILSKY, J.
1899. *In* Küster, H. C., and Kraatz, G., Käfer Europas. V. 36, pp. 70–74, CCC-DDD. Nürnberg.
(158) SCOTT, H.
1910. *In* Sharp, D., Fauna Hawaiiensis. Coleoptera IV. V. 3, p. 644, illus. Cambridge.
(159) ———
1925. NOTE ON THE OCCURRENCE OF LYCTUS VILLOSUS LESNE IN THE HAWAIIAN ISLANDS. Hawaii. Ent. Soc. Proc. 6: 213.
(160) SEIDLITZ, G. VON.
1875. FAUNA BALTICA. DIE KÄFER DER OSTSEEPROVINZ RUSSLANDS. Pp. 160–161. Dorpat.
(161) ———
1891. FAUNA BALTICA, KÄFER. Ed. 2, pp. 56, 234. Königsberg.
(162) ———
1891. FAUNA TRANSSYLVANICA, DIE KÄFER SIEBERBURGENS. Pp. 56, 249. Königsberg.
(163) ———
1898. NACHTRÄGE UND BERICHTIGUNGEN ZUR FAMILIE ANOBIADAE. *In* Erichson, W. F., Naturgeschichte der Insecten Deutschlands. Coleoptera. V. 5, pt. 1, pp. 801–812. Berlin.
(164) SHARP, D.
1886. ON SOME COLYDIIDAE OBTAINED BY MR. LEWIS IN CEYLON. Linn. Soc. London, Jour. 19: 117.

(165) SHARP, D., and MUIR, F.
1912. THE COMPARATIVE ANATOMY OF THE MALE GENITAL TUBE IN COLEOPTERA. Ent. Soc. London, Trans. 3: 533–534, illus.
(166) SHUCKARD, W. E.
1840. THE BRITISH COLEOPTERA DELINEATED. P. 28, illus. London.
(167) SILBERMANN, G. H. R.
1834. MANIÉRE DE RÉCOLTER CERTAINS INSECTS EXOTIQUES PAR M. LE DOCTEUR WALTL. Rev. Ent. 2: 254.
(168) SNYDER, T. E.
1916. EGG AND MANNER OF OVIPOSITION OF LYCTUS PLANICOLLIS. Jour. Agr. Res. 6 (7): 273–276.
(169) ———
1938. PREVENTING DAMAGE BY LYCTUS POWDER-POST BEETLES. U. S. Dept. Agr. Farmers' Bul. 1477, pp. 1–14.
(170) STEBBING, E. P.
1914. INDIAN FOREST INSECTS OF ECONOMIC IMPORTANCE, COLEOPTERA. P. 177, illus. London.
(171) STEPHENS, J. F.
1829. A SYSTEMATIC CATALOGUE OF BRITISH INSECTS. P. 94. London.
(172) ———
1830. ILLUSTRATIONS OF BRITISH ENTOMOLOGY, MANDIBULATA. V. 3, pp. 116–117. London.
(173) THOMSON, C. G.
1859. SKANDINAVIENS COLEOPTERA. V. 1, p. 87. Lund.
(174) ———
1863. SKANDINAVIENS COLEOPTERA. V. 5, pp. 200–205. Lund.
(175) THUNBERG, C. P.
1784. NOVAE INSECTORUM SPECIES DESCRIPTAE. Nova Acta Upsaliensis 4: 4.
(176) TOOKE, F. G. C.
1949. BEETLES INJURIOUS TO TIMBER IN SOUTH AFRICA. Union So. Africa Dept. Agr. Sci. Bul. 293, pp. 28–39, 72–88, illus.
(177) TOURNIER, H.
1874. TABLEAU SYNOPTIQUE DES ESPÈCES EUROPEENES DU GENRE LYCTUS FABR. Petites Nouvelles Ent. 6: 411–412.
(178) VRYDAGH, J. M.
1946. LE PROBLÈME DU LYCTUS BRUNNEUS, AGENT DE LA PIQÛRE DES BOIS. Bul. Agr. du Congo Belge 37, pp. 88–126.
(179) ———
1948. ETUDE DES COLÉOPTÈRES BOSTRYCHIDES RECUEILLIS PAR M. A. COLLART AU CONGO BELGE. Brussels Mus. Roy. d'Hist. Nat. Bul. 24, pp. 1–25.
(180) ———
1951. FAUNE ENTOMOLOGIQUE DES BOIS AU CONGO BELGE. LES INSECTS BOSTRYCHIDES. Bul. Agr. du Congo Belge 42, pp. 65–90.
(181) WALCKENAER, C. A.
1802. FAUNE PARISIENNE . . . V. 1, p. 257. Paris.
(182) WALKER, F.
1858. ON SOME UNDESCRIBED CEYLON INSECTS. Ann. and Mag. Nat. Hist. (ser. 3) 2: 202–209.
(183) WALTL, J.
1832. UEBER DAS SAMMELN EXOTISCHER INSEKTEN. Faunus 1: 167.
(184) WATERHOUSE, C. O.
1876. NEW SPECIES OF COLEOPTERA FROM THE ISLAND OF RODRIGUEZ, COLLECTED BY THE NATURALISTS ACCOMPANYING THE TRANSIT-OF-VENUS EXPEDITION. Ann. and Mag. Nat. Hist. (ser. 4) 18: 117.
(185) ———
1879. COLEOPTERA. ZOOLOGY OF RODRIGUEZ. Roy. Soc. London, Phil. Trans., Ser. B, pp. 168–527.
(186) ———
1894. COLEOPTERA. NEW SPECIES AND NOTES. Ann. and Mag. Nat. Hist. (ser. 6) 14: 68.

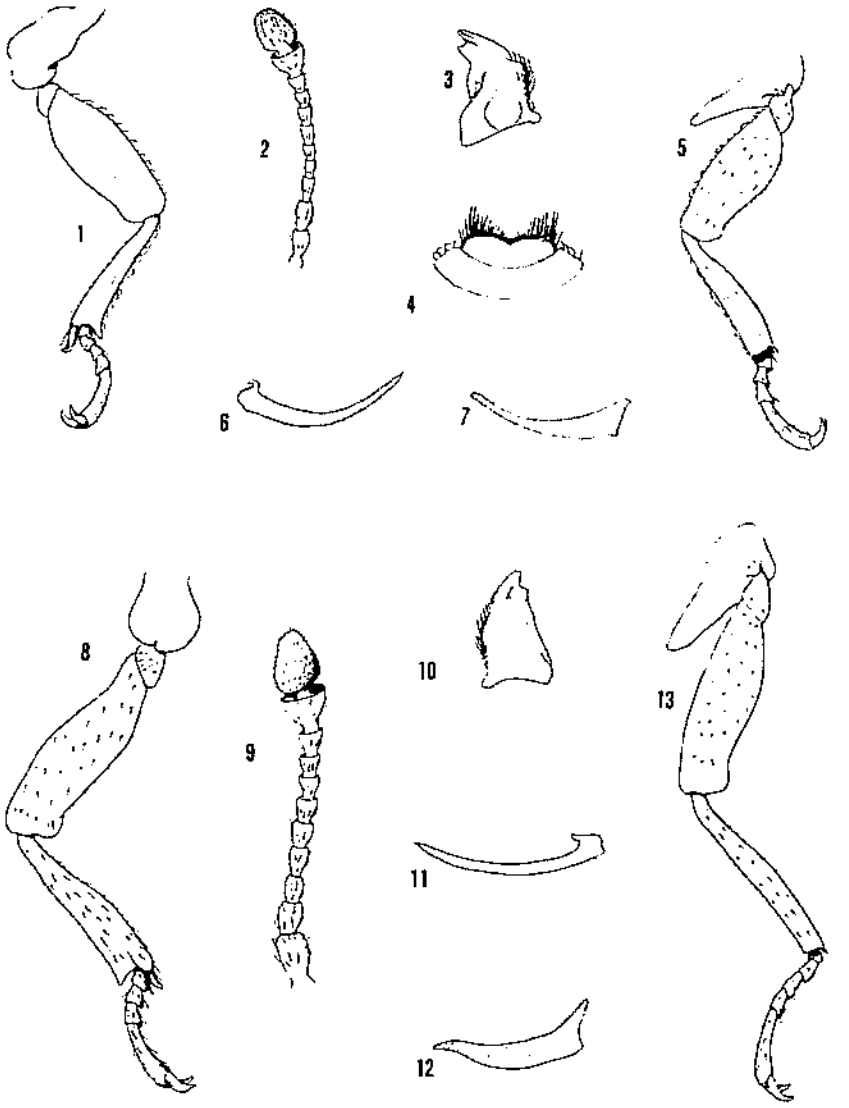
(187) WOLCOTT, G. N.
1948. THE INSECTS OF PUERTO RICO. Puerto Rico Univ. Jour. Agr. 32: 291–292.
(188) WOLLASTON, T. V.
1854. INSECTA MADERENSIA . . . Pp. 151–153, illus. London.
(189) ———
1867. COLEOPTERA ATLANTIDUM. Pp. 233–234. London.
(190) ———
1867. COLEOPTERA HESPERIDUM . . . Pp. 111–113. London.
(191) XAMBEU, P.
1898. MOEURS ET METAMORPHOSIS DU LYCTUS CANALICULATUS FABRICIUS. Soc. Sci. Nat. Ouest France Bul. 8, pp. 69–72.



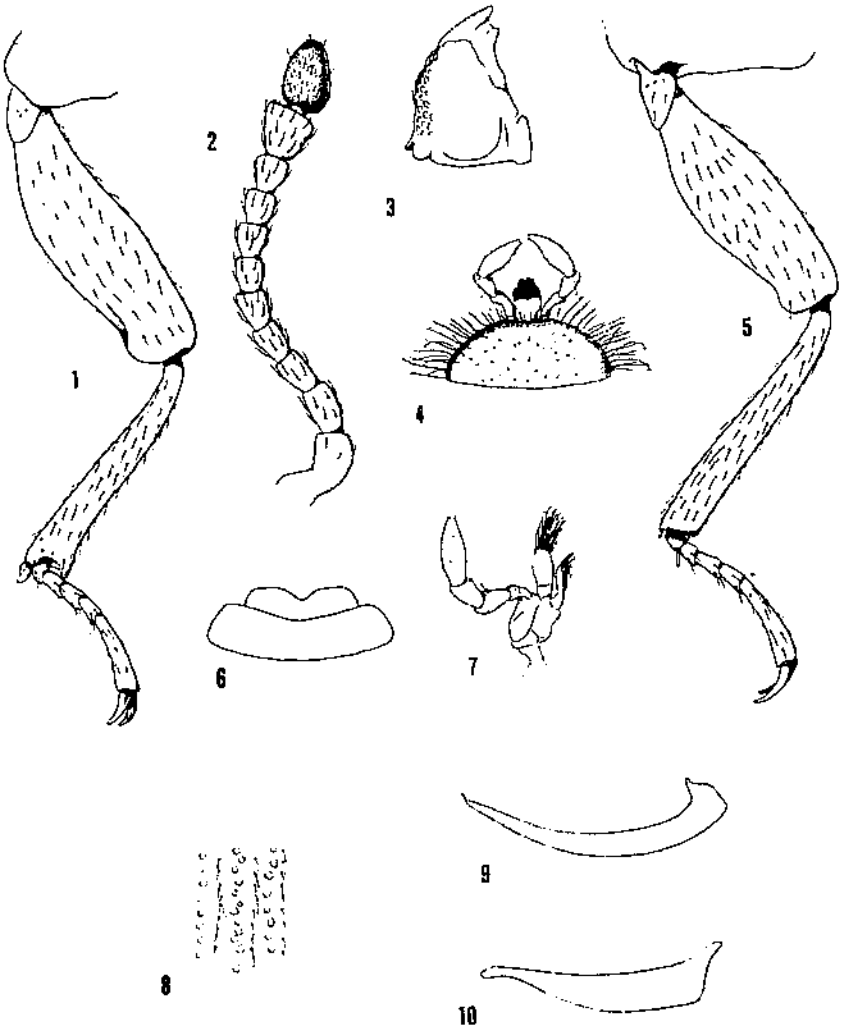
External morphology of a generalized adult lyctid: 1, Ventral aspect; 2, dorsal aspect; 3, male genitalia. Millimeter scale (4) for use with plates II–XIV, on which all parts are drawn to scale. (*AN*, antenna; *ANA*, anterior angle of pronotum; *BP*, basal plate; *CO*, coxal cavity; *ES*, epicranial suture; *F*, femur; *FL* frontal lobe; *IN*, interspace; *ITS*, inner tibial spur; *LA*, labrum; *MAX*, maxilla; *MC*, median canaliculation; *ME*, mentum; *MES*, mesosternum; *MET*, metasternum; *MF*, median fovea; *OTS*, outer tibial spur; *PAR*, paramere; *PC*, postclypeus; *PCL*, postclypeal lobe; *PEN*, penis; *POA*, posterior angle of pronotum; *PRO*, prosternum; *VER*, vertex.)



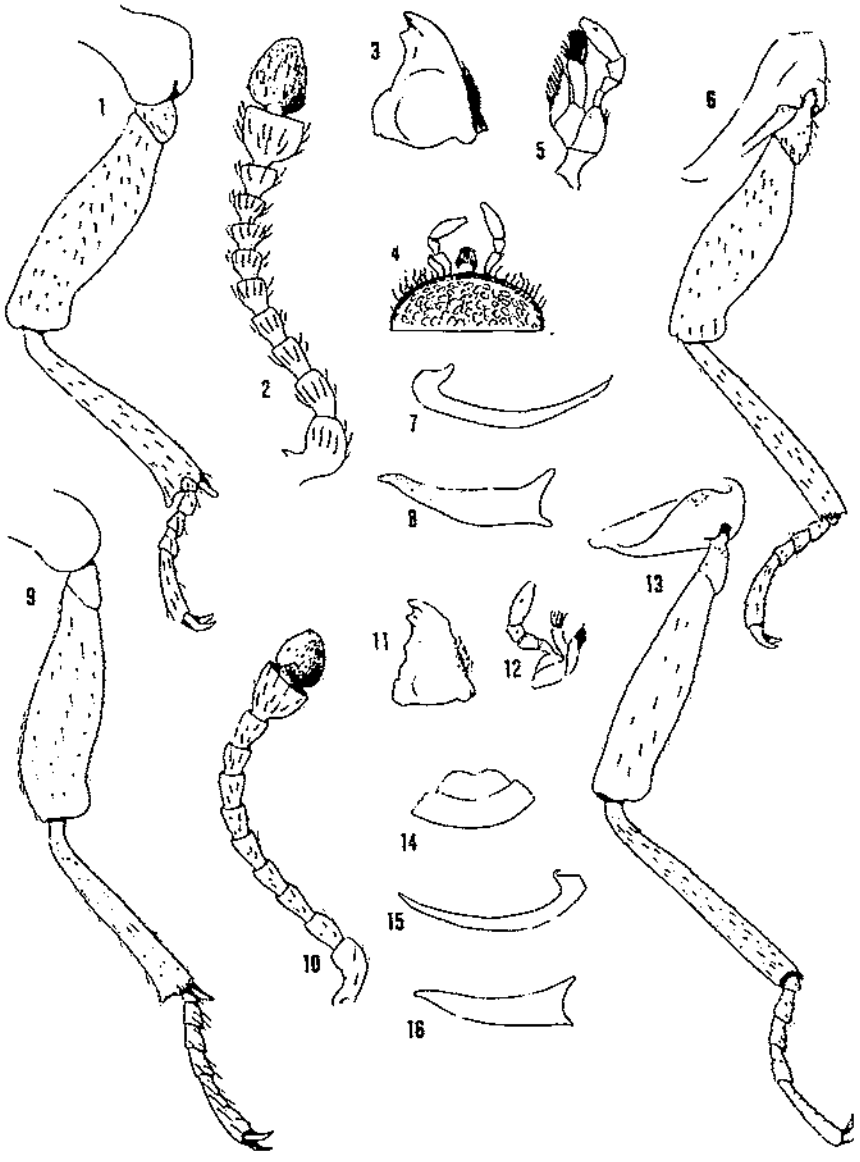
Lyctus africanus: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, metathoracic leg; 5, portion of elytra showing punctations and pubescence; 6, labrum and postclypeus; 7, paramere of male genitalia; 8, penis. *Lyctus brunneus*: 9, Prothoracic leg; 10, antenna; 11, mandible; 12, maxilla; 13, metathoracic leg; 14, labrum and postclypeus; 15, penis; 16, paramere of male genitalia.



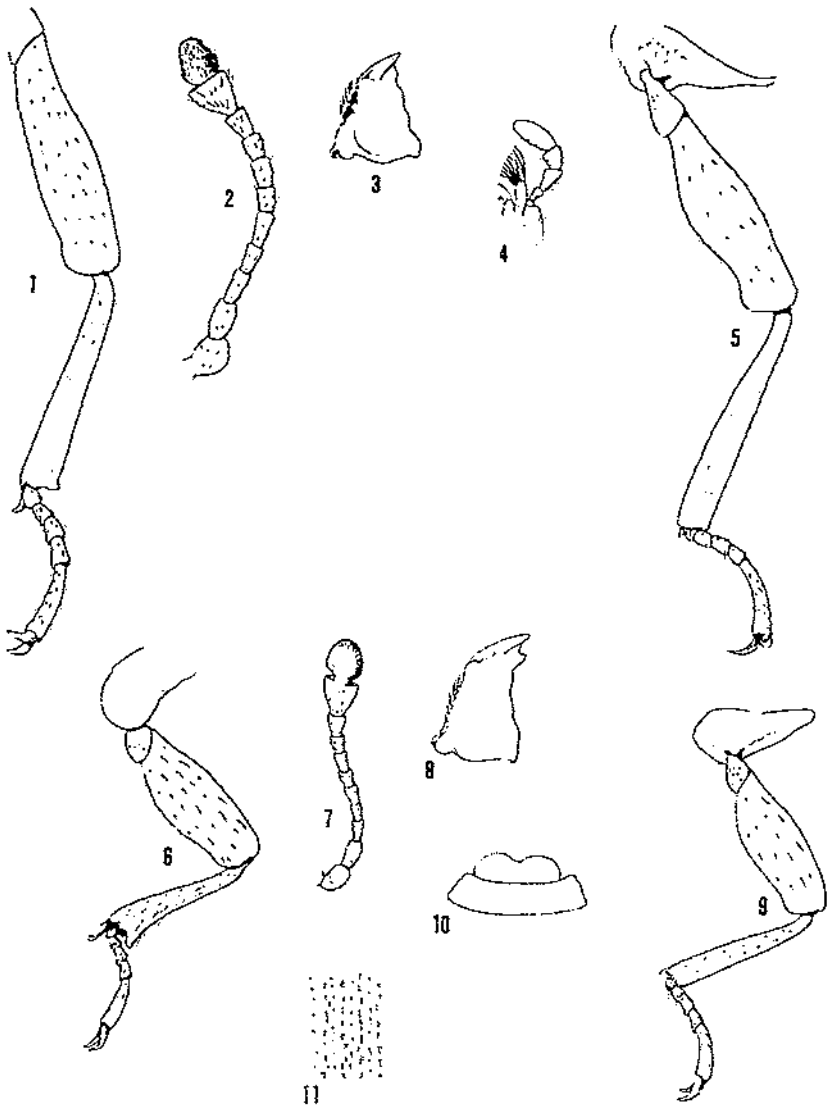
Lyctus caribaeus: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, labrum and postclypeus; 5, metathoracic leg; 6, penis; 7, paramere of male genitalia. *Lyctus cavicollis*: 8, Prothoracic leg; 9, antenna; 10, mandible; 11, penis; 12, paramere of male genitalia; 13, metathoracic leg.



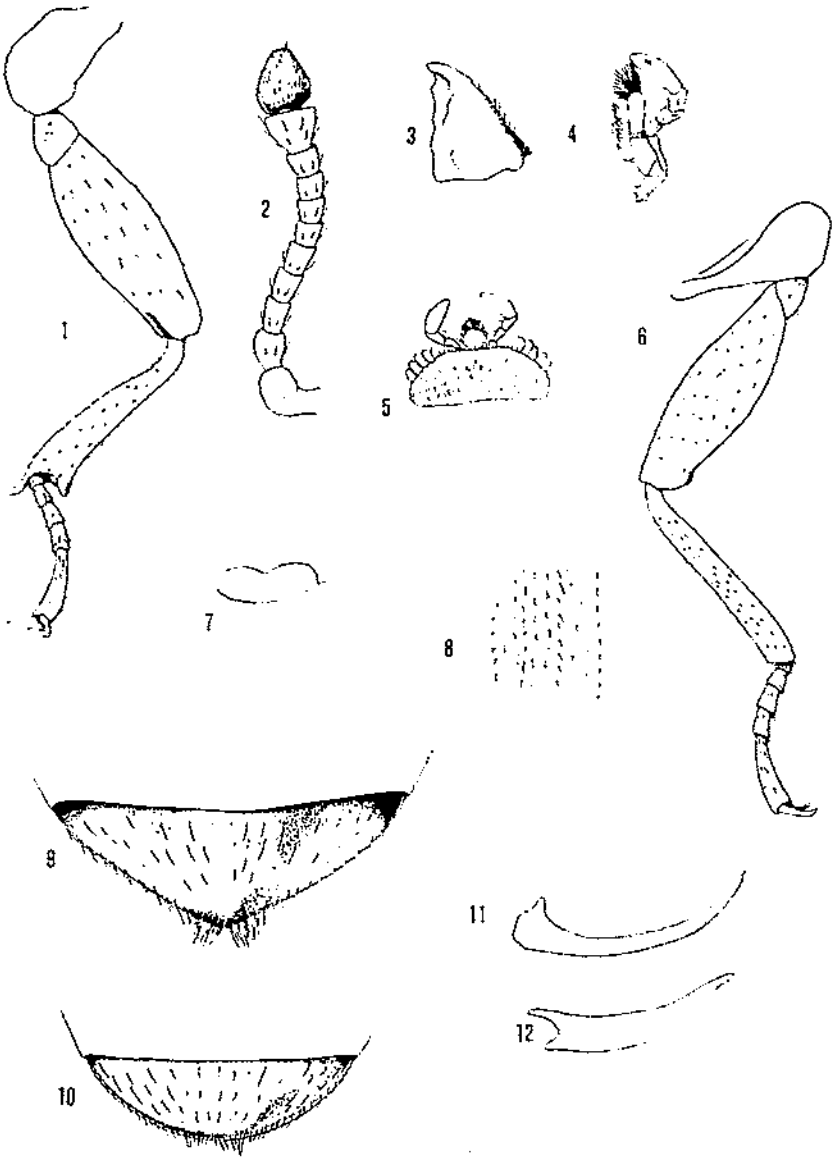
Lyctus chilensis: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, mentum and labium; 5, metathoracic leg; 6, postclypeus and labrum; 7, maxilla; 8, portion of elytra showing punctations and pubescence; 9, penis; 10, paramere of male genitalia.



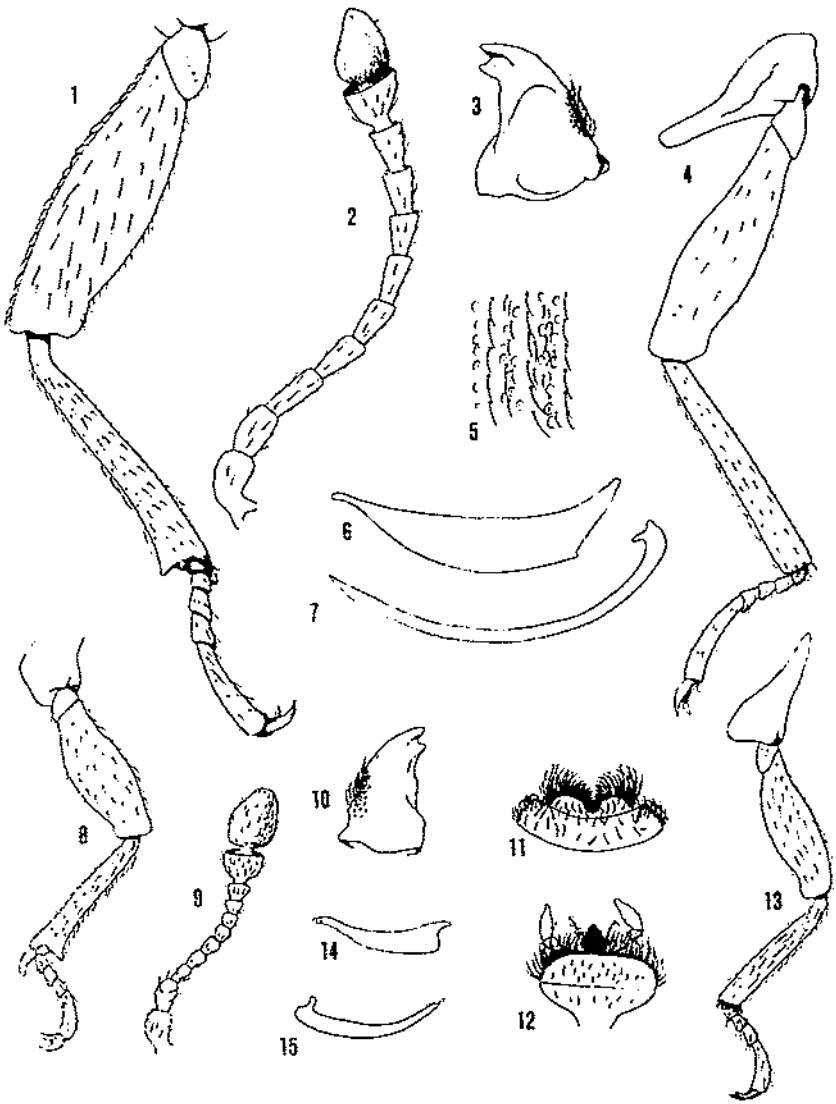
Lyctus linearis: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, mentum and labium; 5, maxilla; 6, metathoracic leg; 7, penis; 8, paramere of male genitalia. *Lyctus opaculus*: 9, Prothoracic leg; 10, antenna; 11, mandible; 12, maxilla; 13, metathoracic leg; 14, postclypeus and labrum (outline); 15, penis; 16, paramere of male genitalia.



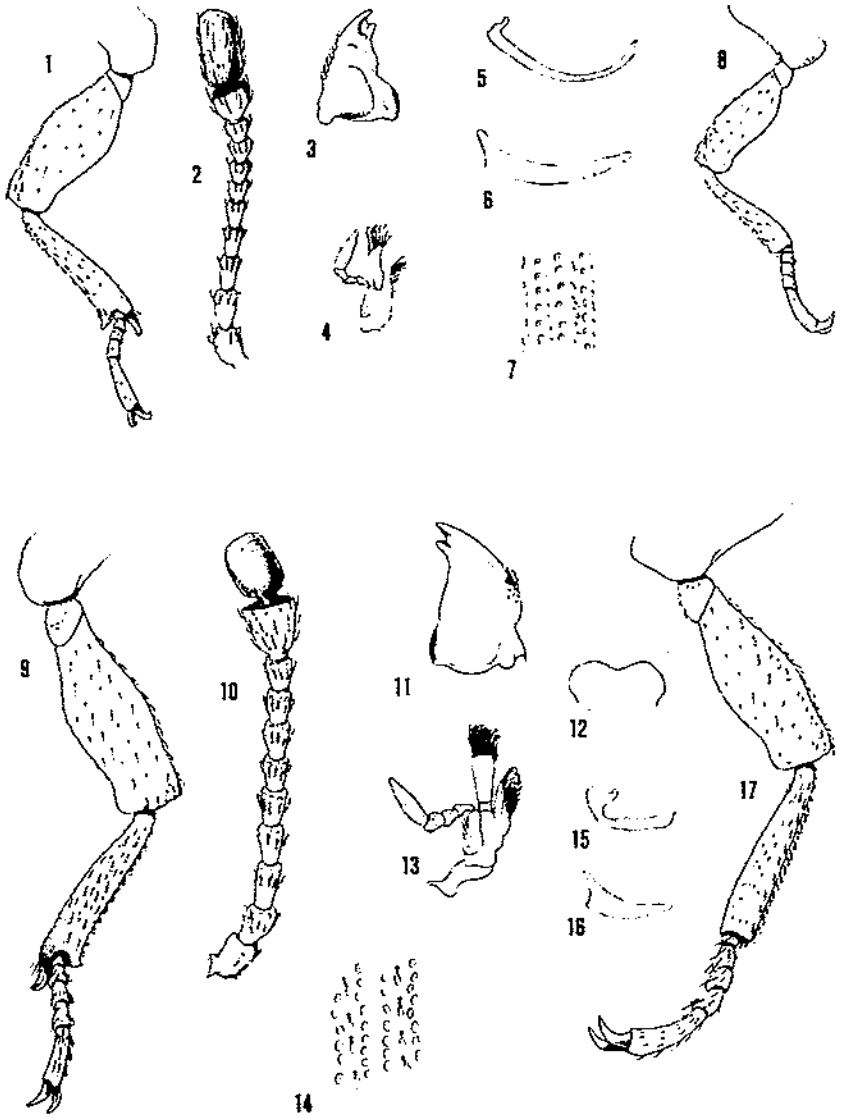
Lyctus parvulus: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, maxilla; 5, metathoracic leg. *Lyctus praestum*: 6, Prothoracic leg; 7, antenna; 8, mandible; 9, metathoracic leg; 10, labrum and postclypeus (outline); 11, portion of elytra showing punctations and pubescence.



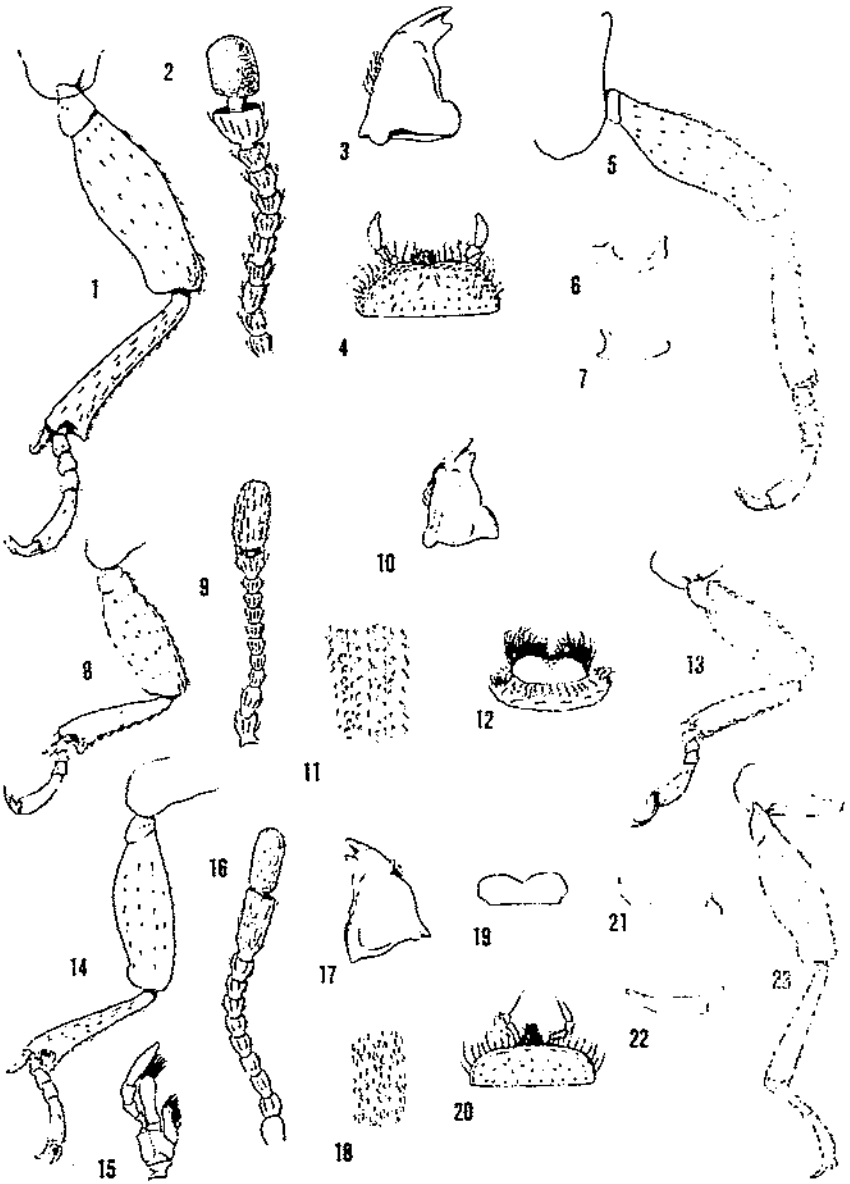
Lyctus planicollis: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, maxilla; 5, mentum and labium; 6, metathoracic leg; 7, labrum (outline); 8, portion of elytra showing punctations and pubescence; 9, fifth abdominal sternite of female; 10, fifth abdominal sternite of male; 11, penis; 12, paramere of male genitalia.



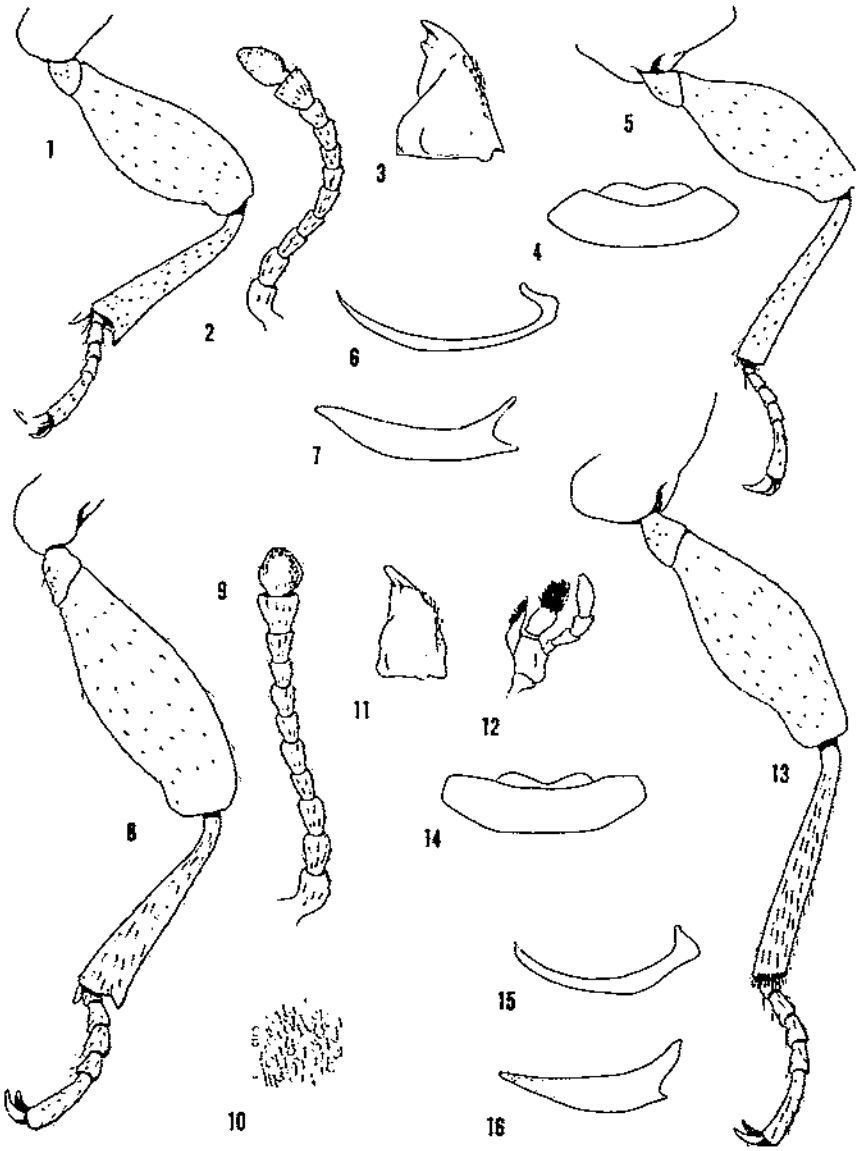
Lyctus simplex: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, metathoracic leg; 5, portion of elytra showing punctations and pubescence; 6, paramere of male genitalia; 7, penis. *Lyctus villosus*: 8, Prothoracic leg; 9, antenna; 10, mandible; 11, labrum and postelypeus; 12, mentum and labium; 13, metathoracic leg; 14, paramere of male genitalia; 15, penis.



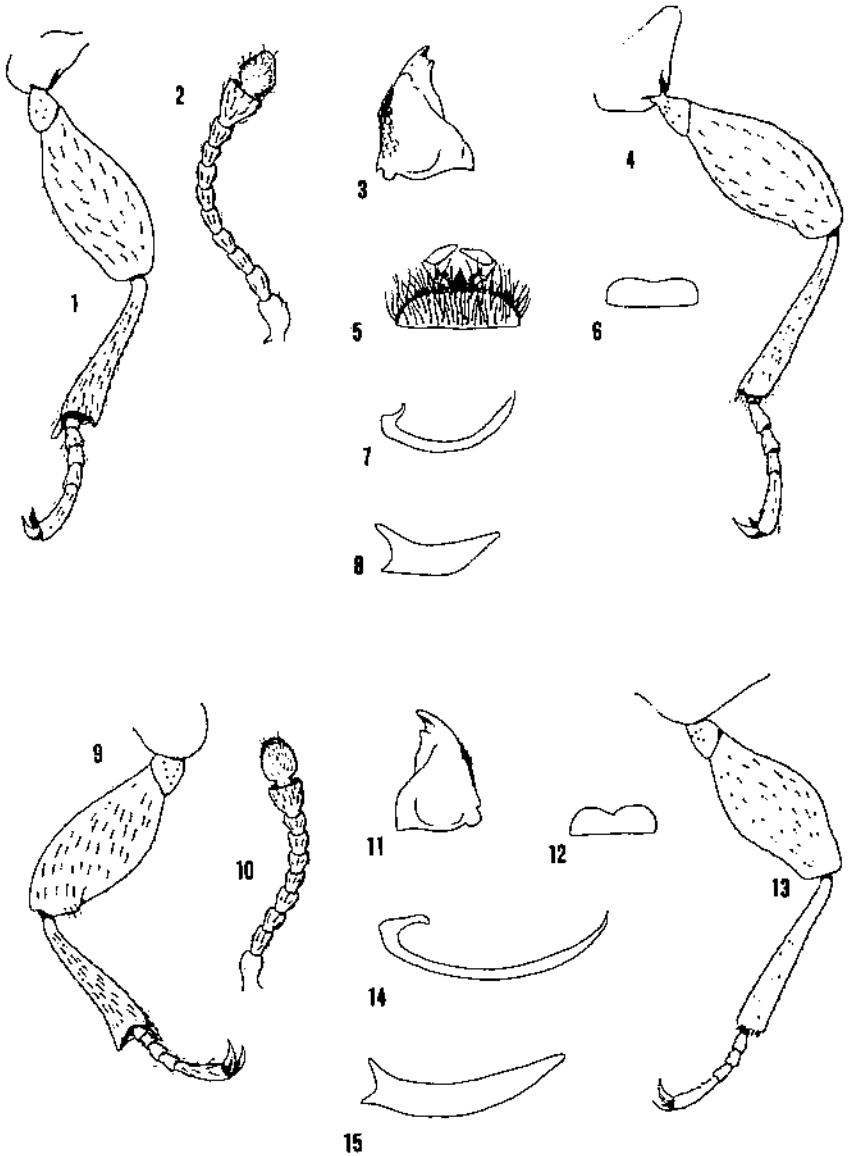
Minthea obstita: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, maxilla; 5, penis; 6, paramere of male genitalia; 7, portion of elytra showing punctations and pubescence; 8, metathoracic leg. *Minthea reticulata*: 9, Prothoracic leg; 10, antenna; 11, mandible; 12, labrum (outline); 13, maxilla; 14, portion of elytra showing punctations and pubescence; 15, penis; 16, paramere of male genitalia; 17, metathoracic leg.



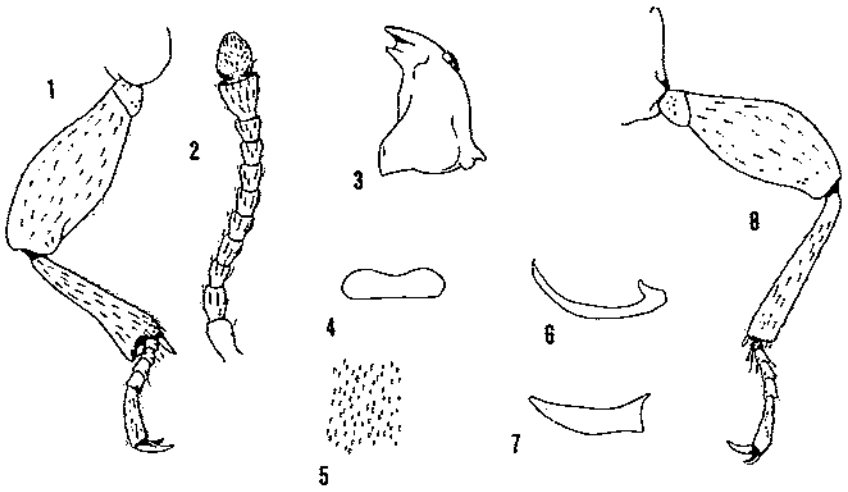
Minthea rugicollis: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, mentum and labium; 5, metathoracic leg; 6, penis; 7, paramere of male genitalia. *Minthea squamigera*: 8, Prothoracic leg; 9, antenna; 10, mandible; 11, portion of elytra showing punctations and pubescence; 12, postclypeus and labrum; 13, metathoracic leg. *Lyctoxylon japonum*: 14, Prothoracic leg; 15, maxilla; 16, antenna; 17, mandible; 18, portion of elytra showing punctations and pubescence; 19, labrum (outline); 20, mentum and labium; 21, penis; 22, paramere of male genitalia; 23, metathoracic leg.



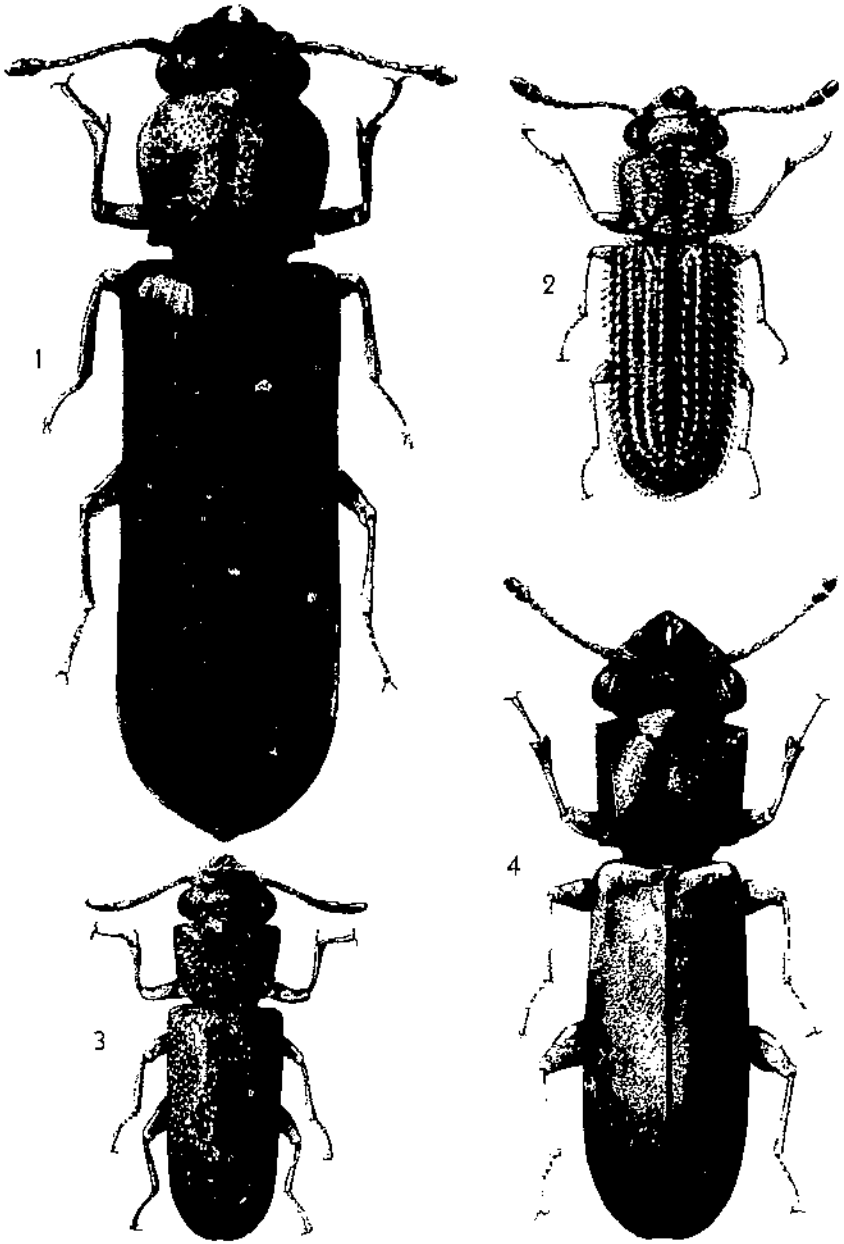
Trogoxylon aequale: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, postclypeus and labrum (outline); 5, metathoracic leg; 6, penis; 7, paramere of male genitalia. *Trogoxylon impressum*: 8, Prothoracic leg; 9, antenna; 10, portion of elytra showing punctations and pubescence; 11, mandible; 12, maxilla; 13, metathoracic leg; 14, postclypeus and labrum (outline); 15, penis; 16, paramere of male genitalia.



Trogoxylon parallelopipedum: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, metathoracic leg; 5, mentum and labium; 6, labrum (outline); 7, penis; 8, paramere of male genitalia. *Trogoxylon prostomoides*: 9, Prothoracic leg; 10, antenna; 11, mandible; 12, labrum (outline); 13, metathoracic leg; 14, penis; 15, paramere of male genitalia.



Trogoxylon punctatum: 1, Prothoracic leg; 2, antenna; 3, mandible; 4, labrum (outline); 5, portion of elytra showing punctations and pubescence; 6, penis; 7, paramere of male genitalia; 8, metathoracic leg.



Adult lyctids: 1, *Lyctus planicollis*; 2, *Minthea rugicollis*; 3, *Lyctoxylon japonum*; 4, *Trogoxylon parallelopipedum*.

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END