

Notes on Reared Cerambycidae (Coleoptera)

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The published information on the larval habits and host relationships of North American Cerambycidae has been summarized by Craighead (1923), and more recently by Linsley (1961–1964). The lack of biological data concerning many species has stimulated the author to attempt to rear them from various hosts.

Infested shrubs and trees were located in the field and samples of the wood were gathered during 1965. Most collections were made between January and May, but material from high in the Sierra Nevada was collected as late as June. Wood samples were sorted according to tree species and original locality, then sealed into separate cardboard boxes and finally, glass jars were screwed into holes cut in the sides of the boxes. Soon after emergence, adults flew toward the light into the jars. Specimens were collected from the jars as they appeared during the next several months.

The rearing boxes were kept outdoors, exposed to the sun, wind, and rain. Cracks around the box lids were sealed with gummed paper. This was far superior to Scotch tape and masking tape which soon lost their adhesive properties in direct sunlight. Rainwater caused several boxes to collapse but those covered with plastic sheets and elevated on platforms several inches above the ground were not damaged. Temperatures in the unventilated boxes were much higher than outside air temperatures on hot days, which probably accounted for much of the observed larval and pupal mortality. Also, as under natural field conditions, a sizable toll was taken by various parasites and predators.

The following summarizes for each species of beetle reared, the dates on which wood samples were collected, the species of host plants involved, and the dates on which the adults emerged into the jars. Notes are also provided on the larval habits or behavior, the different characteristics of the wood, and the exact collection sites. Unless otherwise stated, all wood was dead at the time of collection.

Some of the host associations discovered during the course of these rearings were unknown (according to Drs. Linsley and Chemsak), and many others have not been previously recorded in literature. A number of the host-plant associations listed here are included as confirma-

tions of earlier observations. Plant names are derived from Munz and Keck (1959).

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Anoplodera brevicornis (LeConte).—From *Pinus ponderosa* Dougl. (ponderosa pine) collected in June near Lyons Dam, Tuolumne County, California. The larvae mined in the heartwood of a small rotten stump (8 inches in diameter), and constructed pupal chambers just below the cambium layer. Adults emerged in early July. This is a new host record for this species.

Anoplodera laetifica (LeConte).—From *Pinus sabiniana* (digger pine) from Jamestown, Tuolumne County, California, and from *Pinus attenuata* (knobcone pine) collected 2 miles southeast of Mt. Loma Prieta, Santa Cruz County, California. In both hosts the larvae mined in the rotten heartwood of stumps and limbs that had been dead for about 3 years. The adults emerged in early June.

Anoplodera valida (LeConte).—From *Abies concolor* (white fir) collected in April at Pinecrest, Tuolumne County, California. The larvae were found in a rotten stump, pupated in chambers near the surface, and emerged as adults in late July. This is a new host record for this species.

Astromula nitidum Chemsak and Linsley.—From *Yucca brevifolia* Engelm. (Joshua tree) collected in April, 3 miles south of Pearblossom, Los Angeles County, California. The larvae mined in the heartwood of dead or partially dead limbs on standing trees. A single adult emerged in August. This is the first host record for this recently described species.

Atimia confusa dorsalis LeConte.—From *Libocedrus decurrens* Torr. (incense cedar) collected in April, 4 miles west of Twain Harte, Tuolumne County, California. The larvae mine the cambium layer of small limbs (2 to 4 inches in diameter) and enter the heartwood to pupate. Adults emerged in late July.

Atimia confusa maritima Linsley.—From *Cupressus macrocarpa* Hartw. (Monterey cypress) collected in April, 3 miles north of the Niles district of Fremont, Alameda County, California. The larvae have the same general habits as *A. c. dorsalis*. Adults emerged in early August.

Brothylus conspersus LeConte.—From *Quercus Kelloggii* (black oak) collected in April, 5 miles north of Twain Harte, Tuolumne County, California. One adult was reared from a small limb (2 inches in diameter) which had fallen from the tree. The larvae mine in the heartwood and also pupate there. The adult emerged in July and lived for over 6 months without food or water. Black oak is a new host for this species.

Brothylus gemmulatus LeConte.—From *Quercus agrifolia* (coast live oak) collected 4 miles west of San Rafael, Marin County, California. The larvae mine in the heartwood of dead limbs still on the living trees. The adults emerged in May.

- Callidium californicum*** Casey.—From *Libocedrus decurrens* (incense cedar) collected in April, 8 miles northeast of Sonora, Tuolumne County, California. The larvae mine in the cambium layer of small limbs (2 to 4 inches in diameter) and enter the heartwood to pupate. The adults emerged in May.
- Callidium vandykei*** Linsley.—From *Sequoia sempervirens* (coast redwood) collected in November, 1 mile east of La Honda, San Mateo County, California. The larvae mine in the cambium layer of the crown terminals and limbs of wind-thrown trees, and enter the heartwood to pupate. Adults emerged in January. This wood was kept indoors in a heated room, which may account for the early emergence.
- Callimoxys sanguincolis fuscipennis*** (LeConte).—From *Quercus agrifolia* (coast live oak) collected in April along Niles Canyon, Alameda County, California. The larvae mine in the heartwood of small, dead limbs on the living trees. Adults emerged in late May.
- Canonura spectabilis*** (LeConte).—From *Pinus sabiniana* (digger pine) collected in April along Arroyo Mocho (Mt. Hamilton area), Alameda County, California. The host trees were mature, wind-thrown pines that had been dead for 1 year. The larvae mined in the cambium layer of the main tree trunk and entered the thick bark to pupate. Adults emerged in May and June.
- Clytus planifrons*** (LeConte).—From *Abies concolor* (white fir) collected in April, 5 miles east of West Point, Calaveras County, California. The larvae mine in the cambium layer and enter the heartwood to pupate. The adults emerged in June.
- Dicentrus bluthneri*** LeConte.—From *Sequoia sempervirens* (coast redwood) collected in January near La Honda, San Mateo County, California. The larvae mine in the cambium layer of small limbs (1 to 2 inches in diameter) and enter the heartwood to pupate. The adults are found in their pupal chambers in February but did not emerge until April.
- Ergates pauper*** Linsley.—From *Quercus Wislizenii* A. DC. (interior live oak) collected in April, 8 miles northeast of Sonora, Tuolumne County, California. The larvae mine in the heartwood of fallen rotten limbs (3 to 5 inches in diameter). Adults emerged in late July and early August. This is the first host record for this rare species.
- Ergates spiculatus spiculatus*** (LeConte).—From *Pinus attenuata* Lemmon (knobcone pine) collected in May, 2 miles southeast of Mt. Loma Prieta, Santa Cruz County, California. The adults emerged from the rotten stump in July.
- Eucrossus villicornis*** LeConte.—From *Pinus sabiniana* (digger pine) collected in April along Isabel Creek (Mt. Hamilton area), Santa Clara County, California. The trees were wind-thrown and dead about 1 year. The larvae mined in the cambium layer of the main tree trunk and, before pupating, bored into the bark to make an oval exit hole. The larvae filled this hole with coarse frass and returned to the heartwood where they constructed pupal chambers parallel with the grain of the wood. The adults emerged in July and August.
- Grammoptera militaris*** (Chevrolat).—From *Acer macrophyllum* Pursh. (broad-leaf maple) collected in April along Alameda Creek (Niles Canyon), Alameda County, California. The larvae mine the cambium layer of limbs 2 to 6 inches in diameter and pupate beneath the bark in oval chambers surrounded by coarse frass. The adults emerged in late April and early May. This is a new host record for this species.

Hybodera tuberculata LeConte.—From *Acer macrophyllum* (broadleaf maple) collected in April, 5 miles west of Sunol, Alameda County, California. The larvae mine in the cambium layer for a short period, then enter the heartwood, pupate, and emerge as adults in May. Many adults overwinter in their pupal chambers.

Lampropterus cyanipennis (LeConte).—From *Quercus agrifolia* (coast live oak) collected in April in Niles Canyon, Alameda County, California. The larvae mine in the heartwood of small dead limbs, 1 to 2 inches in diameter, on the living trees. Adults emerged in May. This constitutes a new host record for this species.

Lampropterus ruficollis (LeConte).—From *Quercus Douglasii* (blue oak) collected from Niles Canyon, Alameda County, California; and from *Ceanothus thyrsiflorus* (blue blossom) collected 7 miles northeast of Woodside, San Mateo County, California. The larvae mine in the heartwood of small limbs (up to 3 inches in diameter). Adults emerged in May. Some adults overwinter in their pupal chambers.

Leptostylus nebulosus Horn.—From *Abies concolor* (white fir) collected in June, 3 miles north of Strawberry, Tuolumne County, California. The host tree was a wind-thrown specimen, 20 feet tall, and dead about 1 year. The adults emerged in late June and early July.

Monochamus fulvomaculatus Linsley.—From *Pinus sabiniana* (digger pine) collected along Arroyo Mocho (Mt. Hamilton area), Santa Clara County, California. Also, from *Pinus Coulteri* D. Don. (Coulter pine) collected 4 miles north of the summit of Mt. Hamilton, Santa Clara County, California. The host trees were wind-thrown and had been dead for 1 year. The larvae mine in the cambium layer of the crown terminals (2 to 5 inches in diameter) and enter the heartwood to construct pupal chambers either parallel with the grain or with the terminal end slightly angled toward the surface of the wood. Adults emerged in June, July, and August. More than 50 specimens were reared from approximately 30 linear feet of trunk terminals. These data constitute the only confirmed host records for this species.

Monochamus maculosus Haldeman.—From *Pinus ponderosa* (ponderosa pine) collected in April, 6 miles east of Sonora, Tuolumne County, California. Adults emerged in late June and early July.

Monochamus obtusus Casey.—From *Abies concolor* (white fir) collected in June, 15 miles southeast of Tuolumne, Tuolumne County, California. The larvae have the same general habits as most others of this genus. Adults emerged in both June and July. Mr. Richard L. Penrose collected adults of this species in their pupal chambers in the limbs of *Pinus sabiniana* (digger pine), 6 miles west of Twain Harte, Tuolumne County, California. Both of the hosts listed above are new records for this species.

Monochamus oregonensis LeConte.—From *Abies concolor* (white fir) collected in April at Pinecrest, Tuolumne County, California. The larvae display the same general habits as most others of this genus, but the terminals attacked are usually larger (5 to 10 inches in diameter). The adults emerged in early June.

Nathrius brevipennis (Mulsant).—From *Juglans regia* (English walnut) collected in March in San Jose, Santa Clara County, California. The larvae mine

in the heartwood of very small limbs, less than an inch in diameter. Adults emerged in May.

Neacanthocinus obliquus obliquus (Casey).—From *Pinus ponderosa* (ponderosa pine) collected in May near Sonora, Tuolumne County, California. The larvae have the same general habits as *N. obliquus pacificus*. Adults emerged in late June.

Neacanthocinus obliquus pacificus (Casey).—From *Pinus sabiniana* (digger pine) collected in April, 3 miles northeast of the summit of Mt. Hamilton, and from *Pinus Coulteri* (Coulter pine) collected in April, 4 miles northeast of the summit of Mt. Hamilton, Santa Clara County, California. The trees were wind-thrown and had been dead for about 1 year. The larvae mine in the cambium layer of the main tree trunk and in the large limbs. Pupation occurs in the heartwood or beneath the bark in oval cells surrounded with coarse frass. The adults emerged in June. Coulter pine is a new host record for this species.

Neoclytus balteatus LeConte.—From *Ceanothus integerrimus* H. & A. (deer-brush) collected in April, 5 miles north of Twain Harte, Tuolumne County, California. The larvae mine in the heartwood of live or injured limbs, 2 to 3 inches in diameter, and pupate in chambers in the heartwood. The adults emerged in July.

Neoclytus conjunctus (LeConte).—From *Quercus lobata* (valley oak) collected in Jamestown, Tuolumne County, California; *Quercus Wislizenii* (interior live oak) collected 8 miles northeast of Sonora, Tuolumne County, California; and from *Quercus Kelloggii* (black oak) collected 2 miles northeast of the summit of Mt. Hamilton, Santa Clara County, California. The larvae mine in the cambium layer of nearly all small-to-large limbs and in some cases, the main trunk. The majority of the larval stage is spent in the heartwood, and pupation also occurs here. The adults emerged in June.

Neoclytus nubilis Linsley.—From *Abies concolor* (white fir) collected in May near Strawberry, Tuolumne County, California. One adult emerged in June from a small (2 feet high) tree that had been killed by bark beetles.

Osmidus guttatus LeConte.—From *Prosopis pubescens* (screw bean mesquite) collected in April, 14 miles south of Beatty, Nye County, Nevada. One adult was taken in its pupal chamber from a fallen limb 3 inches in diameter. This is the first record of a host for this species.

Phymatodes decussatus (LeConte).—From *Quercus Douglasii* (blue oak) collected in March, 2 miles southwest of the summit of Mt. Hamilton, Santa Clara County, California; and from *Quercus Wislizenii* (interior live oak) collected 8 miles northeast of Sonora, Tuolumne County, California. The larvae mine in the cambium layer of small- to medium-sized limbs (2 to 6 inches in diameter) and pupate in the terminal end of their galleries. The adults emerged in May and June.

Phymatodes juglandis Leng.—From *Juglans californica* Wats. (California black walnut) collected in April at William Street Park, San Jose, California. The larvae mine in the cambium layer of small limbs, 2 to 4 inches in diameter, and enter the heartwood to pupate. Adults emerged in May.

Phymatodes lecontei Linsley.—From *Quercus lobata* Nee. (valley oak) collected in June near Jamestown, Tuolumne County, California; *Quercus agrifolia* Nee. (coast live oak) collected 4 miles west of San Rafael, Marin County, California;

Quercus Wislizenii (interior live oak) collected 8 miles northeast of Sonora, Tuolumne County, California; and *Quercus Douglasii* (blue oak) collected 2 miles southwest of the summit of Mt. Hamilton, Santa Clara County, California. The larvae mine in the cambium layer of medium-sized limbs or in the main tree trunk and pupate in the heartwood, the bark, or the terminal end of their galleries. The adults emerged in June.

Phymatodes maculicollis LeConte.—From *Abies concolor* (white fir) collected in April near Strawberry, Tuolumne County, California. The larvae mine in the cambium layer of small limbs, 1 to 2 inches in diameter, and enter the heartwood to pupate. Adults emerged in May. A small percentage of the adults overwinter in their pupal chambers.

Phymatodes nitidus LeConte.—From *Libocedrus decurrens* (incense cedar) collected in April, 8 miles northeast of Sonora, Tuolumne County, California. The larvae mine in the cambium layer of small limbs, 2 to 4 inches in diameter, and enter the heartwood to pupate. Adults emerged in May and June.

Phymatodes vulneratus (LeConte).—From *Acer macrophyllum* (broadleaf maple) collected in April, 3 miles west of Sunol, Alameda County, California. The larvae mine in the cambium layer of small limbs, 2 to 3 inches in diameter, and pupate in the heartwood. Adults emerged in May and June.

Poliaenus oregonus LeConte.—From *Abies concolor* (white fir) collected in April near Strawberry, Tuolumne County, California. The larvae mine in the cambium layer of small limbs, 2 to 3 inches in diameter, and enter the heartwood to pupate. Adults emerged from late June to August.

Rhagium inquisitor (Linnaeus).—From *Pinus sabiniana* Dougl. (digger pine) collected in February, 7 miles west of the summit of Mt. Hamilton, Santa Clara County, California. The host trees were wind-thrown pines that had been dead for about 1 year. The larvae mine the cambium layer of the main trunk. Oval chambers, surrounded by coarse frass are constructed beneath the bark before pupating. Adults emerged in May.

Saperda horni Joutel.—From *Salix* sp. (willow) collected in May, 4 miles southwest of Antioch, Contra Costa County, California. The larvae mine the heartwood of living limbs (2 to 4 inches in diameter). Adults emerged in June.

Semanotus amethystinus (LeConte).—From *Libocedrus decurrens* (incense cedar) collected in April, 8 miles northeast of Sonora, Tuolumne County, California. The larvae mine in the cambium layer of the main tree trunk (mature trees are apparently the preferred hosts) and enter the thick bark to pupate. The adults emerged in late June.

Semanotus ligneus amplus (Casey).—From *Libocedrus decurrens* (incense cedar) collected in March, 8 miles northeast of Sonora, Tuolumne County, California. The larvae mined in the cambium layer and entered the heartwood to pupate. Many had overwintered in their pupal chambers and emerged in April.

Synaphaeta guexi (LeConte).—From *Salix lasiandra* Benth. (yellow willow) collected in Fremont, Alameda County, California; *Alnus rhombifolia* Nutt. (white alder) collected 3 miles east of Sonora, Tuolumne County, California; *Rhamnus californica* Esch. (coffeeberry) collected along Arroyo Mocho, Alameda County, California; *Juglans regia* (English walnut) collected in San Jose, Santa Clara County, California; and from *Prunus* sp. (domestic cherry)

collected in Sonora, Tuolumne County, California. The wood listed above was collected between March and April. In all cases the larvae mined in the cambium layer and entered the heartwood before pupating. Some of the adults overwinter in their pupal chambers and emerge in May and June. Coffeeberry is a new host record for this species.

Tetropium abietis Fall.—From *Abies concolor* (Gord. and Glend.) Lindl. (white fir) collected in June at Pinecrest, Tuolumne County, California. The larvae mine in the cambium layer of the main trunk and enter the thick bark to pupate. Adults emerged in July.

Tragidion armatum LeConte.—From *Yucca Whipplei* Torr. (Quixote plant) collected in April, 5 miles south of Palmdale, Los Angeles County, California. The larvae mine in the center of old flower stalks and emerge as adults in July.

Xylotrechus insignis LeConte.—From *Salix* sp. (willow) collected in May, 5 miles west of Antioch, Contra Costa County, California. The larvae mine in the heartwood of injured or dying limbs, especially those limbs attacked by *Saperda horni* Joutel. The adults emerged in June.

Xylotrechus longitarsis Casey.—From *Pseudotsuga menziesii* (Douglas fir) collected in April along St. Helena Creek, at the Napa County line, 12 miles north of Calistoga, California. The larvae mine in the cambium layer and later in the heartwood of the main tree trunk. Adults emerged in July.

Xylotrechus nauticus (Mannerheim).—From *Quercus lobata* (valley oak) collected at Jamestown, Tuolumne County, California; *Quercus Douglasii* (blue oak) collected 3 miles north of Niles, Alameda County, California; *Quercus agrifolia* (coast live oak) collected 4 miles west of San Rafael, Marin County, California; *Juglans regia* (English walnut) collected in San Jose, Santa Clara County, California; *Juglans californica* (California black walnut) collected in San Jose, California; *Salix lasiandra* Benth. (yellow willow) collected in Fremont, Alameda County, California; and from *Pyrus* sp. (domestic apple) collected in Fremont, California. The larvae mine in the cambium layer for a short period of time and then enter the heartwood. The adults emerged in July.

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