

LIST OF MONTANA SCOLYTIDAE (COLEOPTERA) AND NOTES ON NEW RECORDS

Sandra J. Gast¹, Malcolm M. Furniss², James B. Johnson²,
and Michael A. Ivie³

ABSTRACT.—Listed are 96 species of Scolytidae (Coleoptera) from Montana. Eighteen species reported from Montana for the first time are: *Scierus pubescens* Swaine, *Hylastinus obscurus* (Marsham), *Hylesinus aculeatus* Say, *Hylesinus californicus* (Swaine), *Hylesinus criddlei* (Swaine), *Pseudohylesinus granulatus* (LeConte), *Dendroctonus punctatus* LeConte, *Phloeosinus hoferi* Blackman, *Phloeosinus pini* Swaine, *Carphoborus pinicolens* Wood, *Scolytus subscaber* LeConte, *Ips grandicollis* (Eichhoff), *Trypodendron betulae* Swaine, *Trypodendron retusum* (LeConte), *Trypophloeus populi* Hopkins, *Procryphalus mucronatus* (LeConte), *Pityophthorus alpinensis* G. Hopping, and *Gnathotrichus denticulatus* Blackman.

Montana, third largest of the contiguous 48 states, with elevations ranging from 555 to 3,901 m, is diverse ecologically and has flora representative of vaster areas around it. This circumstance has resulted in the occurrence of numerous scolytid species there. Ninety-six species are listed herein, including 18 species new to the state. Judging from published distributions of scolytids in Montana and from vegetation that grows in surrounding states and Canadian provinces, we believe additional species will doubtless be found in Montana.

Of the new records, only one species, *Hylastinus obscurus* (Marsham), is known not to be native to Montana. Another of the new Montana species, *Hylesinus aculeatus* Say, appears to be distributed throughout the range of green ash in the eastern half of Montana. This tree commonly exhibits progressive branch killing, which suggests to us that a fungus may be associated with the beetle. We recommend that this possibility be studied because of the importance of green ash as an ornamental tree.

Our source of published records of Montana scolytids is Wood (1982). Other records were obtained from the collections at Montana State University, USDA Forest Service Region One, Montana Division of Forestry, and by our collections.

Measurements of host trees are in metric units, as are distances from landmarks, al-

though the latter are invariably in miles on labels of pinned museum specimens. Names of collectors are given as per labels or as stated in the literature. The numbers of known pinned adult specimens follow the collection data. Specimens deposited in the University of Idaho, William F. Barr Entomological Museum, are designated UI-WFBM. Other depositories are USDA Forest Service, Region One, Missoula (FS-R1); Montana State University, Bozeman (MSU); Montana Division of Forestry, Missoula (MDF); and State University of New York (SUNY).

SPECIES NEW TO MONTANA

Subfamily Hylesininae

Scierus pubescens Swaine

BIOLOGY.—Monogynous, unstudied. Infests *Abies lasiocarpa* and *Picea engelmannii* (Wood 1982).

DISTRIBUTION AND NOTES.—CANADA: Alta., B.C.; USA: Alas., Colo., Ida. MONTANA: Bozeman Creek, 6,200' (1,890 m), Gallatin Co., VIII–IX-1987, pitfall trap, D. L. Gustafson (1 MSU).

Hylastinus obscurus (Marsham)

BIOLOGY.—Monogynous. Infests the root crown of red clover in the spring. It is less common in other clovers. Overwinters as larvae or adults in the roots. There is one generation each year (Wood 1982).

¹USDA Forest Service, Box 7669, Missoula, Montana 59807.

²Division of Entomology, University of Idaho, Moscow, Idaho 83843-4196.

³Department of Entomology, Montana State University, Bozeman, Montana 59717-0002.

DISTRIBUTION AND NOTES.—EUROPE; NORTH AFRICA; CANADA: B.C., Ont.; USA: Calif., Conn., Ga., Ida., Ind., Md., Mass., Mich., N.H., N.J., N.Y., Ohio, Ore., Ut., Wash. MONTANA: Hamilton, Ravalli Co., 11-V-1936, Wilfred Shockley (1 MSU). Ronan, Lake Co., 8-VIII-1940, clover roots, H. B. Mills (2 MSU).

Hylesinus aculeatus Say

BIOLOGY.—Monogynous. Infests the bole and limbs of *Fraxinus* spp. Egg galleries are transverse and deeply etch the wood. Overwintering beetles evidently form feeding tunnels on green bark (Wood 1982).

DISTRIBUTION AND NOTES.—CANADA: Man., N.S., Ont., Que.; USA: Ark., Colo., Conn., D.C., Ill., Ind., Iowa, Kans., La., Me., Md., Mass., Mich., Miss., Nebr., N.H., N.J., N.Y., N.C., N.D., Ohio, Okla., Pa., S.C., S.D., Tenn., Tex., Va., W. Va. MONTANA: Conrad, Ponderosa Co., 7-XI-1985, *F. pennsylvanica*, J. Barringer (12 MSU). Cow Creek, Custer NF., Powder River Co., 31-V-1988, *F. pennsylvanica*, M. M. Furniss and S. J. Gast (21 UI-WFBM). Attacking broken-off trunk. Eight km N of Alzada, Carter Co., I-VI-1988, *F. pennsylvanica*, M. M. Furniss and S. J. Gast (44 UI-WFBM). Infesting a felled 30-cm-diameter tree. Galleries throughout the stem and branches to a diameter of 2 cm. Galleries contained parents, eggs, and larvae.

Hylesinus californicus (Swaine)

BIOLOGY.—Monogynous. Evidently indistinguishable from *H. aculeatus* (Wood 1982).

DISTRIBUTION AND NOTES.—MEXICO: Chih.; USA: Ariz., Calif., Colo., N.M., N.D., Tex., Ut. MONTANA: Harlowton, Wheatland Co., 11-VII-1981, *Fraxinus* sp. (1 MSU). Bozeman, Gallatin Co., 1-10-VI-1988, funnel trap, D. L. Gustafson (1 MSU).

Hylesinus criddlei (Swaine)

BIOLOGY.—Monogynous, unstudied.

DISTRIBUTION AND NOTES.—CANADA: Man., Ont., Que., Sask.; USA: Colo., Iowa, Kans., Mich., Minn., N.D., S.D. MONTANA: Bozeman, Gallatin Co., VII-VIII-1977, sticky trap, S. Kohler (1 MDF). Bozeman, Gallatin Co., 1-30-IV-1988, funnel trap, D. L. Gustafson (1 MSU).

Pseudohylesinus granulatus (LeConte)

BIOLOGY.—Monogynous. Infests the base and roots of weakened true firs, Douglas-fir, and western hemlock. Egg galleries are short and transverse. A two-year life cycle is reported in northern Washington (Furniss and Carolin 1980).

DISTRIBUTION AND NOTES.—CANADA: B.C.; USA: Calif., Ida., Ore., Wash. MONTANA: Lake Co., 26-V-1936, R. D. Eichmann (1 MSU).

Dendroctonus punctatus LeConte

BIOLOGY.—Monogynous. Infests basal stem and roots of boreal spruces.

DISTRIBUTION AND NOTES: CANADA.—Alta., B.C., N.B., Newf., N.W.T., Ont., Que., Yukon; USA: Alas, Ida.⁴, Penn., N.Y., W. Va. MONTANA: Glacier N.P., 11-VI-1986, *Picea glauca* x *engelmannii*, M. M. Furniss and J. B. Johnson (7 UI-WFBM). One gallery in a severely suppressed, 66-year-old tree of 17 cm basal diameter. Upper Red Rock Lake, Beaverhead Co., 29-V-1988, *P. glauca* x *engelmannii*, M. M. Furniss and S. J. Gast (15 UI-WFBM). Mature larvae at ground level in a 60-cm-diameter green tree; new adults in base of a 28-cm-diameter tree that had broken off at 1.5 m aboveground, one small branch with red foliage remained. Boulder Creek, Sweet Grass Co., 25-VII-1988, *Picea glauca* x *engelmannii*, M. M. Furniss and J. B. Johnson (59 UI-WFBM). Live female adults and young larvae collected near ground level in a live, suppressed, 90-year-old tree of 30 cm basal diameter and 14 m height.

Phloeosinus hoferi Blackman

BIOLOGY.—Monogynous. Unstudied. Infests bark of small branches and twigs of dying trees (Wood 1982).

DISTRIBUTION AND NOTES.—CANADA: B.C.; USA: Ariz., Calif., Colo., Ida., Nev., N.M., N.D., S.D., Tex., Ut., Wyo. MONTANA: 18 km SW of Alder, Madison Co., 7-IX-1978, *Juniperus scopulorum*, M. M. Furniss (11 ♀, 4 ♂ UI-WFBM). Infesting 5-cm-diameter stem. Thirteen km E of Decker, Bighorn Co., 31-V-1988, *Juniperus* sp., M. M. Furniss and

⁴Unpublished record: Henrys Lake, Fremont Co., 22-VII-1988, *Picea glauca* x *P. engelmannii*, M. M. Furniss and J. B. Johnson (2 UI-WFBM). At ground level in a 25-cm-diameter, 8-m-tall, 35-year-old tree that had shed its dead foliage.

S. J. Gast (10 ♀, 10 ♂ UI-WFBM). Infesting faded 2.5-cm-diameter branch. Thirty-four km NE of Decker, Bighorn Co., 31-V-1988, *J. scopulorum*, M. M. Furniss and S. J. Gast (13 UI-WFBM). Infesting small branches of a felled 15-cm-diameter tree. Cow Creek, Custer NF, Powder River Co., 31-V-1988, *Juniperus* sp., M. M. Furniss and S. J. Gast (12 ♀, 13 ♂ UI-WFBM). Infesting lightly faded 1–1.5-cm-diameter branches on a 5-cm-diameter live tree. One and one-half km N of Tripoint Lookout, Custer NF, Carter Co., 2-VI-1988, *Juniperus* sp., M. M. Furniss and S. J. Gast (6 ♀, 5 ♂ UI-WFBM). Infesting 5-cm-diameter tree with faded top; galleries contained female beetles and eggs. Three km E of Reedpoint, Stillwater Co., 2-VI-1988, *J. scopulorum*, M. M. Furniss and S. J. Gast (11 UI-WFBM). Infesting 1–3-cm-diameter stem of a faded tree.

Phloeosinus pini Swaine

BIOLOGY.—Monogynous. Specimens have been reared from spruce branches and from a broken top of Jack pine (Wood 1982).

DISTRIBUTION AND NOTES.—CANADA: Man., N.W.T., Que.; USA: Alas., Ida.⁵, Mich. MONTANA: Upper Red Rock Lake, Beaverhead Co., 29-V-1988, *Picea glauca* x *P. engelmannii*, M. M. Furniss and S. J. Gast (13 ♀, 12 ♂ UI-WFBM; 1 ♀, 1 ♂ FS-R1). Infesting 4-cm-diameter suppressed sapling. Much of the bark had been removed by woodpeckers.

Carphoborus pinicolens Wood

BIOLOGY.—Polygynous. Infests unthrifty or injured seedlings and broken branches of pines. Healthy seedlings on poor sites have also been killed by this beetle (Wood 1982).

DISTRIBUTION AND NOTES.—USA: Ariz., Calif., Colo., Ida., Nev., N.M., Ore., Ut., Wyo. MONTANA: Cardwell, Jefferson Co., 3-VI-1988, *Pinus flexilis*, M. M. Furniss and S. J. Gast (3 ♀, 2 ♂ UI-WFBM). Infesting 5-cm-diameter branches with red foliage; also present were *Pityophthorus* spp.

Subfamily Scolytinae

Scolytus subscaber LeConte

BIOLOGY.—Monogynous. Breeds in shaded-out branches and tops of suppressed or over-mature trees. Egg galleries form a rounded E-shape and are typically impregnated with resin. Larval mines are hidden in phloem at first, then appear on the phloem inner face, extending in any direction (Wood 1982).

DISTRIBUTION AND NOTES.—CANADA: B.C.; USA: Calif., Ida., Ore., Wash. MONTANA: Roaring Lion Creek, 9 km S of Hamilton, Ravalli Co., 19-VII-1988, *Abies grandis*, M. M. Furniss and J. B. Johnson (1 ♀ UI-WFBM). Infesting a 3–4-cm-diameter bayonet-top of a 30-cm-diameter suppressed tree. Typical galleries also noted in 2½–4-cm-diameter broken branches on ground at this locality.

Ips grandicollis (Eichhoff)

BIOLOGY.—Breeds in slash, small branches, and vacant spaces among galleries of more aggressive bark beetles. Hosts include virtually all pines within its range. In the South, six or more generations occur per year; fewer probably occur in Montana.

DISTRIBUTION AND NOTES.—CANADA: Man., Ont., Que.; BAHAMAS; DOMINICAN REPUBLIC; GUATEMALA; HONDURAS; JAMAICA; NICARAGUA; USA: Great Lake states and New England to southern states, and isolated locations in Nebr. and S.D. MONTANA: North of Tripoint Lookout, Sioux Division, Custer NF, Carter Co., 2-VI-1988, *Pinus ponderosa*, M. M. Furniss and S. J. Gast (8 UI-WFBM, 2 SUNY). Infesting branches 2.5 cm diameter and smaller.

Trypodendron betulae Swaine

BIOLOGY.—Monogynous. Tunnels are constructed by females radially through bark into sapwood. The main tunnel branches at close intervals, left or right, in the same plane. Eggs are laid in niches oriented above and below the gallery. Larvae excavate short cradles in which they develop and feed on ambrosia fungus. Males are active in keeping the tunnels clean and aerated.

DISTRIBUTION AND NOTES.—CANADA: Alta., B.C., Man., N.B., N.S., N.W.T., Ont., Que.; USA: Ida., Me., Mass., Minn., N.H., N.J., N.Y., S.D., Wisc. MONTANA: 16 km SE of Olney, Flathead Co., 10-VI-1986, *Alnus* sp., M. M. Furniss and J. B. Johnson (1 ♀,

⁵Unpublished record: Henrys Lake, Fremont Co., 21-VII-1985, *Picea glauca* x *P. engelmannii* hybrid, M. M. Furniss and J. B. Johnson (4 UI-WFBM). Reared from lower branches of mature, standing tree that died in 1984.

1 ♂ UI-WFBM). Infesting 6-cm-diameter stem of a dying tree; a larva was present in one cradle.

Trypodendron retusum (LeConte)

BIOLOGY.—Monogynous. Infests stems of dying *Populus* spp; galleries are constructed radially at first, then follow growth rings transversely. Larvae develop in cradles aligned in single series above and below the transverse galleries. They feed on ambrosia fungus introduced by the parents (Wood 1982).

DISTRIBUTION AND NOTES.—CANADA: Alta., B.C., Man., N.B., Ont., Que., Sask.; USA: Alas., Ariz., Calif., Colo., Conn., Ida., Mich., Minn., Nev., N.H., N.M., N.Y., Ore., Penn., S.D., Ut., Vt., Wash., W. Va., Wisc. MONTANA: Gallatin Co., 12-V-1942 (1 MSU). Eighteen km SW of Alder, Madison Co., IX-8-1978, *Populus tremuloides*, M. M. Furniss (1 UI-WFBM). Three km N Tripoint Lookout, Carter Co., 2-VI-1988, *P. tremuloides*, M. M. Furniss and S. J. Gast (4 UI-WFBM). Infesting stem of 9–12-cm-diameter recently dead tree.

Trypophloeus populi Hopkins

BIOLOGY.—The monogynous female excavates an irregular, 2-cm-long gallery just beneath the bark surface of stems or branches of standing, unhealthy, or dying trees. The galleries and larval mines do not show on the inner surface of the bark. One to one and one-half generations per year occur in Utah, overwintering as larvae; eggs are present in July (Petty 1977).

DISTRIBUTION AND NOTES.—CANADA: Man., N.B., Sask.; USA: Ariz., Colo., Ida., Nev., Ut. MONTANA: About 5 km N Tripoint Lookout, Carter Co., 2-VI-1988, *Populus tremuloides*, M. M. Furniss and S. J. Gast (1 UI-WFBM). Sparsely infesting a limb of a standing dead tree.

Procryphalus mucronatus (LeConte)

BIOLOGY.—Monogynous. Prefers soft, fermenting, dead aspen bark; usually follows primary invasion by *Trypophloeus populi* Hopkins. The gallery is narrower and the bark overlying the gallery is thicker than that of *T. populi*. One and one-half to two annual generations (Utah), overwintering as larvae and adults. Eggs appear in late May (Petty 1977).

DISTRIBUTION AND NOTES.—CANADA: Alta., B.C.; USA: Alas., Colo., Ida., Nev., N.M., Ut. MONTANA: 18 km SW Alder, Madison Co., 8-IX-1978, *Populus tremuloides*, M. M. Furniss (7 UI-WFBM). About 5 km N Tripoint Lookout, Carter Co., 2-VI-1988, *P. tremuloides*, M. M. Furniss and S. J. Gast (2 UI-WFBM). Cadavers found in limb of dead mature aspen. Upper Red Rock Lake, Beaverhead Co., 20-VII-1988, *P. tremuloides*, M. M. Furniss and J. B. Johnson (4 UI-WFBM). Infesting stem of 30-cm-diameter tree. The last remaining live branch budded in spring 1988 and died. Adults had begun new galleries recently.

Pityophthorus alpinensis G. Hopping

BIOLOGY.—Polygynous. Infests broken branches and twigs, apparently one generation annually.

DISTRIBUTION AND NOTES.—CANADA: Alta.; USA: Ida. MONTANA: Poorman Basin, 9 km NE Eureka, Lincoln Co., 21-VII-1988, *Larix lyallii*, S. J. Gast (2 ♀, 2 ♂ UI-WFBM; 2 ♀, 2 ♂ FS-R1). Lolo Peak, Missoula Co., 13-VIII-1988, *L. lyallii*, S. J. Gast and P. F. Kolb (2 ♀, 2 ♂ UI-WFBM; 2 ♀, 2 ♂ FS-R1). Trapper Peak, Ravalli Co., 2-X-1988, *L. lyallii*, S. J. Gast (5 ♀, 1 ♂ UI-WFBM; 6 ♀, 2 ♂ FS-R1). Infesting broken branches 0.5–4 cm diameter.

Gnathotrichus denticulatus Blackman

BIOLOGY.—Monogynous. Galleries are initiated by males and extend radially into xylem from which transverse tunnels follow the growth rings. Larvae develop in cradles excavated by them and feed primarily on ambrosia fungus introduced by the parents (Wood 1982).

DISTRIBUTION AND NOTES.—MEXICO: Chih., D.F., Dgo., Guer., Mich., Pue., San Luis Potosi; USA: Ariz., Colo., N.M., S.D., Tex., Ut. MONTANA: Cow Creek Campground, Powder River Co., 1-VI-1988, *Pinus ponderosa*, M. M. Furniss and S. J. Gast (19 UI-WFBM). Infesting the base of a mature, lightning-struck tree with faded foliage. *Hylurgops s. subcostulatus* (Mannerheim), *Hylastes* sp., and *Orthotomicus caelatus* (Eichhoff) infesting the same tree. Lantis Springs Campground, Carter Co., 2-VI-1988, *P. ponderosa*, M. M. Furniss and S. J. Gast (1 UI-WFBM). Infesting 61-cm-diameter tree with

red foliage. *Dendroctonus valens* LeConte larvae and *Ips calligraphus* (Germar) adults also present.

MONTANA SCOLYTIDAE

HYLESININAE

Hylastini

- Scierus annectens* LeConte
- Scierus pubescens* Swaine
- Hylurgops porosus* (LeConte)
- Hylurgops reticulatus* Wood
- Hylurgops rugipennis pinifex* (Fitch)
- Hylurgops s. subcostulatus* (Mannerheim)
- Hylastes gracilis* LeConte
- Hylastes longicollis* Swaine
- Hylastes macer* LeConte
- Hylastes nigrinus* (Mannerheim)
- Hylastes ruber* Swaine

Hylesinini

- Alniphagus aspericollis* (LeConte)
- Hylastinus obscurus* (Marsham)
- Hylesinus aculeatus* Say
- Hylesinus californicus* (Swaine)
- Hylesinus criddlei* (Swaine)

Tomicini

- Xylechinus montanus* Blackman
- Pseudohylesinus granulatus* (LeConte)
- Pseudohylesinus n. nebulosus* (LeConte)
- Dendroctonus brevicomis* LeConte
- Dendroctonus murrayanae* Hopkins
- Dendroctonus ponderosae* Hopkins
- Dendroctonus pseudotsugae* Hopkins
- Dendroctonus punctatus* LeConte
- Dendroctonus rufipennis* (Kirby)
- Dendroctonus valens* LeConte

Phloeotribini

- Phloeotribus lecontei* Schedl

Phloeosinini

- Phloeosinus hoferi* Blackman
- Phloeosinus pini* Swaine
- Phloeosinus punctatus* LeConte

Hypoborini

- Chaetophloeus heterodoxus* (Casey)

Polygraphini

- Carphoborus carri* Swaine
- Carphoborus pinicolens* Wood
- Carphoborus ponderosae* Swaine
- Polygraphus rufipennis* (Kirby)

SCOLYTINAE

Scolytini

- Scolytus laricis* Blackman
- Scolytus monticolae* Swaine
- Scolytus multistriatus* (Marsham)
- Scolytus opacus* Blackman
- Scolytus piceae* (Swaine)
- Scolytus rugulosus* (Müller)
- Scolytus subscaber* LeConte
- Scolytus tsugae* Swaine
- Scolytus unispinosus* LeConte
- Scolytus ventralis* LeConte

Crypturgini

- Crypturgus borealis* Swaine

Dryocoetini

- Dryocoetes affaber* (Mannerheim)

- Dryocoetes autographus* (Ratzeburg)
- Dryocoetes betulae* Hopkins
- Dryocoetes confusus* Swaine
- Dryocoetes sechelti* Swaine

Ipini

- Pityogenes carinulatus* (LeConte)
- Pityogenes fossifrons* (LeConte)
- Pityogenes knechteli* Swaine
- Pityokteines lasiocarpi* (Swaine)
- Pityokteines minutus* (Swaine)
- Pityokteines ornatus* (Swaine)
- Orthotomicus caelatus* (Eichhoff)
- Ips b. borealis* Swaine
- Ips calligraphus* (Germar)
- Ips emarginatus* (LeConte)
- Ips grandicollis* (Eichhoff)
- Ips integer* (Eichhoff)
- Ips latidens* (LeConte)
- Ips mexicanus* (Hopkins)
- Ips montanus* (Eichhoff)
- Ips perterbatus* (Eichhoff)
- Ips pilifrons utahensis* Wood
- Ips pini* (Say)
- Ips p. plastographus* (LeConte)
- Ips tridens engelmanni* Swaine
- Ips woodi* Thatcher

Xyloterini

- Trypodendron betulae* Swaine
- Trypodendron lineatum* (Olivier)
- Trypodendron retusum* (LeConte)
- Trypodendron rufitarsis* (Kirby)

Xyleborini

- Xyleborus intrusus* Blandford

Cryphalini

- Cryphalus r. ruficollis* Hopkins
- Trypophloeus populi* Hopkins
- Procryphalus mucronatus* (LeConte)

Corthylini

- Conophthorus ponderosae* Hopkins
- Pityophthorus absonus* Blackman
- Pityophthorus alpinensis* G. Hopping
- Pityophthorus aquilus* Blackman
- Pityophthorus boycei* Swaine
- Pityophthorus confertus* Swaine
- Pityophthorus confinis* (LeConte)
- Pityophthorus digestus* (LeConte)
- Pityophthorus fuscus* Blackman
- Pityophthorus murrayanae* Blackman
- Pityophthorus nitidus* Swaine
- Pityophthorus pseudotsugae* Swaine
- Pityophthorus tuberculatus* Eichhoff
- Pityophthorus scalptus* Bright
- Gnathotrichus denticulatus* Blackman
- Gnathotrichus retusus* (LeConte)

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