



**The Bark-Gnawing Beetles of Montana, USA  
(Coleoptera: Trogossitidae, Peltidae, and  
Lophocateridae), Including New Substantial  
Distributional Records for *Tenebroides collaris* (Sturm)**

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# THE BARK-GNAWING BEETLES OF MONTANA, USA (COLEOPTERA: TROGOSSITIDAE, PELTIDAE, AND LOPHOCATERIDAE), INCLUDING NEW SUBSTANTIAL DISTRIBUTIONAL RECORDS FOR *TENEbroIDES COLLARIS* (STURM)

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## ABSTRACT

Eight species of Trogossitidae, three of Peltidae, and one of Lophocateridae are reported from Montana. Of these, six represent new state records. Records of *Tenebroides collaris* (Sturm) represent a substantial new westward range extension; supported by additional new records from Colorado, this species appears to be established in the western Great Plains.

Keywords: Cleroidea, survey, ecology, collecting methods

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## INTRODUCTION

Montana's 380,800-km<sup>2</sup> land area makes it the third largest of the 48 contiguous states of the USA. Its northern position at the crossroads of the Great Plains and Rocky Mountains physiographic regions, with approximately 35% of its total land area managed by two state and four federal agencies, lends itself well to arthropod surveys (Montana State and Federal Management Agencies 2018). Unfortunately, Montana's remote location, low population, and large size are also contributing factors to a historical lack of faunistic surveys. Three recently published studies illustrate Montana's arthropod knowledge gap. In a study of the Cerambycidae (Coleoptera), the longhorn beetles, the number of recorded species increased 68% from 96 to 151 (Hart *et al.* 2013). This dramatic increase in known taxa was in large part a result of the Montana Wood-Boring Insect Survey conducted in cooperation with the Montana Department of Agriculture and US Department of Agriculture. Beginning in 2006, the Montana Wood-Boring Insect Survey sampled all 56 Montana counties, utilizing various collecting methods including Lindgren funnel traps, panel traps, and ultraviolet light traps (UVT) (M. A. Ivie, *in litt.*). A second recent survey providing new insights into Montana's Coleoptera biodiversity was by Etzler and Seibert (2022), who increased the number of known Elateridae (Coleoptera), the click beetles, from 93 to 184. The importance of this study is highlighted by the fact that the larval stages of some click beetle species are documented agricultural pests; with over 16 million acres utilized as cropland in Montana, accurate identifications are key to species-specific control methods (Etzler and Seibert 2022; National Agricultural Statistics Service 2021). The

third survey documented 28 species of bumble bees (*Bombus* Latreille; Hymenoptera: Apidae) (Dolan *et al.* 2017). While this study increased the number of recorded species by only one, it significantly increased the number of occurrence localities and specimens available for study.

During the process of identifying the bark-gnawing beetles housed in the Montana Entomology Collection (MTEC) at Montana State University, Bozeman, Montana, USA, the recognition of numerous new state records in addition to a large number of recent collecting records provided impetus for a statewide synopsis. Until recently the Trogossitidae, or bark-gnawing beetles, have represented a morphologically diverse and systematically unstable family of beetles within the Cleroidea (Gimmel *et al.* 2019). A recent molecular phylogeny of the Cleroidea supported the elevation of what were formerly recognized as Trogossitidae subfamilies or tribes to six families: Rentoniidae, Protopeltidae, Thymalidae, Trogossitidae, Peltidae, and Lophocateridae (Gimmel *et al.* 2019). For convenience, and because of their historical association, these groups are treated together in this paper; only the latter three families occur in Montana. Taxonomically, the North American fauna has been treated by Barron (1971, 1996) and only two additional taxa have been described since (Dajoz 1990, 1997).

Only two dedicated North American bark-gnawing beetle faunistic studies exist that the author is aware of. The first is Mutchler and Weiss (1929), who provided descriptions, keys, and illustrations for the seven genera and 14 species recorded from New Jersey. The second is Majka (2011), who recorded eight species, four of which were new regional records, for Atlantic Canada.

While this study is based primarily on material in the MTEC, it represents the only dedicated single state survey west of the Great Plains for these Cleroidea families. The paucity of Montana records is evidenced by the fact that Barron (1971) recorded only five species: *Calitys scabra* (Thunberg), *Corticotomus caviceps* (Fall), *Temnoscheila chlorodia* (Mannerheim), *Tenebroides occidentalis* (Fall), and *Tenebroides sinuatus* (LeConte), from a total of six locations in only five of 56 Montana counties. Two more species, *Tenebroides corticalis* (Melsheimer) and *Tenebroides mauritanicus* (Linnaeus), were indicated as known from the state (Barron 1971) without specific localities. By comparison, the current study verified the presence of 12 species from 47 counties. Montana's bark-gnawing beetle fauna represents a diversity of genera and species of primarily Boreal genera (*Peltis* Müller and *Calitys* Thomson), western North American genera (*Eronyxa* Reitter), eastern North American species [*Tenebroides collaris* (Sturm)], and western North American species [*Tenebroides crassicornis* (Horn)], as well as other, more broadly distributed genera and species. Figure 1 indicates that while the present records contribute to a more detailed account of taxon-level distribution within Montana, nine of the state's 56 counties still lack records. Additionally, in 15 counties only one species is so far known.

Documentation of the bark-gnawing beetle for the surrounding states of Idaho, Wyoming, or North Dakota is unfortunately sparse. Barron (1971, 1996) provided specific records for seven genera and 12 species for Idaho, only two genera and two species for Wyoming, and, surprisingly, no records for North Dakota. Both *T. corticalis* and *T. mauritanicus* should occur in these states even though Barron (1971) did not provide specific records for either.

Kirk and Balsbaugh (1975) listed five genera and eight species for South Dakota. Apart from Barron (1971), the majority of bark-gnawing beetle records for the United States appear in broad faunistic reviews (e.g., Evans 2014, 2021; Hatch 1961; Leschen 2002) or as inclusions in surveys of either bark beetles (Allison *et al.* 2013; Hopkins 1902; Sakamoto 2007) or Cerambycidae (e.g., Miller *et al.* 2013, 2018). The number of species recorded for the Canadian provinces bordering Montana—British Columbia, Alberta, and Saskatchewan—are 17, six, and six, respectively (Bousquet *et al.* 2013).

While the MTEC dates to 1898, the majority of their holdings were collected since 1985 and represent two main sources. The first is the large amount of material collected by Daniel L. Gustafson who arrived at MSU in 1985 and, through association with the curator, became interested in beetles. He collected throughout Montana and his extensive collection is deposited in the MTEC. The second are efforts overseen by Michael A. Ivie including a fire study in the North Fork Valley of Glacier National Park (Ivie *et al.* 1998) and the Montana Wood-Boring Beetle Project. The majority of MTEC bark-gnawing beetle collection was taken as secondary by-catch during surveys for Cerambycidae, Buprestidae (Coleoptera), Scolytinae (Coleoptera: Curculionidae), and Siricidae (Hymenoptera), or in ecological work not focused on taxonomic studies (M. A. Ivie, *in litt.*). The attraction of the adults of the genera *Temnoscheila* Westwood and *Tenebroides* Piller and Mitterpacher to baited traps targeting saproxylic beetles in the United States has been recorded by Allison *et al.* (2013) and Miller *et al.* (2013, 2016, 2018, 2022). Sakamoto (2007) found adults of the previously rarely collected trogossitid species *Nemozoma attenuatum* Van Dyke to be attracted in large numbers

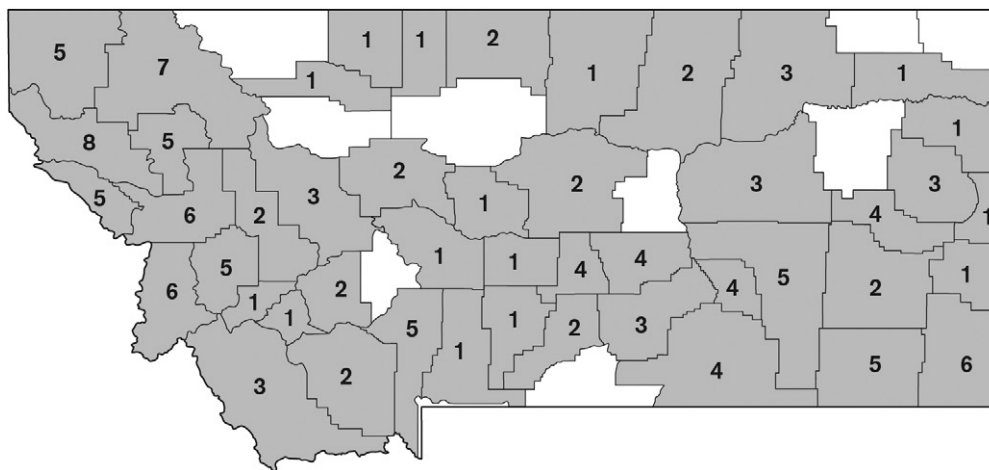


Fig. 1. Map of Montana counties with number of bark-gnawing beetle species recorded for each.

(871 specimens) to Lindgren traps baited with semiochemical attractants of *Pityophthorus* Eichhoff (Scolytinae) species in California.

## MATERIALS AND METHODS

Species-level determinations of adult Trogossitidae housed in MTEC were made utilizing Barron (1971, 1996) and comparisons with previously expertly identified material. For each species, only county-level records are listed following Hart *et al.* (2013), Dolan *et al.* (2017), and Etzler and Seibert (2022), and is appropriate due to the dispersal abilities of adults. The majority of published county records (Barron 1971, 1996; Russell 1968) correspond with specimens housed in MTEC, thus only county records from published accounts that are not represented in the MTEC are mentioned. The numbers in parentheses appearing after county names indicate the number of MTEC specimens examined from that county.

## RESULTS AND DISCUSSION

### Trogossitidae Latreille, 1802

#### *Calitys* Thomson, 1859

This Holarctic genus is represented by two species in North America. A single species has been found in Montana, but the second species, *Calitys minor* Hatch, is known from the western United States and in scattered Canadian provinces, including a record from Shoshone Co., Idaho, approximately 18 km west of the Montana border (Barron 1971). Kolibáč (2013) indicated that the members of this genus are fungivorous.

#### *Calitys scabra* (Thunberg, 1784)

This Holarctic species has a broadly recorded distribution in the Boreal regions of North America as well as west of the Great Plains in the United States. Montana records indicate it is primarily associated with the Northwestern Forested Mountain (NFM) Level I Ecoregion (Commission for Environmental Cooperation 1997). Both the single Fergus County and single Hill County records were associated with isolated, higher-elevation Middle Rockies Level III Ecoregions surrounded by lower-elevation Northwestern Great Plains and Northwestern Glaciated Plains Level III Ecoregions, respectively (Woods *et al.* 2002). The only Montana specimens collected within the northwestern Great Plains were from a forested outcrop area of the Long Pines Unit of Custer Gallatin National Forest in Carter County. It is interesting to note that in Montana, the known distribution of this species coincides with the distribution of ponderosa pine,

*Pinus ponderosa* Douglas ex. C. Lawson (Pinaceae; Data Basin 2022). In total, 88 specimens were examined, only 11 of which were collected by Lindgren funnels and one from a vane trap baited with “spruce, EtOH Ge.Ac.”. The two specimens from Carter County were recorded as having been reared from the woody fungus *Fomes* (Fr.) Fr. (Polyporaceae) collected on *P. ponderosa*.

**County Records (Fig. 2A):** Beaverhead (1), Carter (2), Fergus (1), Flathead (20), Gallatin (5), Granite (1), Hill (1), Lake (1), Lincoln (17), Mineral (1), Missoula (1), Ravalli (32), Sanders (5).

#### *Corticotomus* Sharp, 1891

This New World genus has 15 recognized species, seven of which are found in North America (Kolibáč 2013). Barron (1971) reported that the North American species have been collected upon or reared from a variety of trees, primarily conifers, and are all believed to be predators of bark beetles. A single species has been found in Montana.

#### *Corticotomus caviceps* (Fall, 1910)

This species has broad distribution west of the Great Plains in the United States and Canada (Barron 1971). This species' disjunct recorded distribution in Montana (Fig. 2B) is most likely an artifact of collecting and sampling. It likely inhabits most, if not all, of the NFM ecoregion. While this species can be collected by beating freshly downed pines (personal observation) or rearing from a variety of trees, primarily conifers (Barron 1971), all 54 Montana specimens examined were collected by Lindgren funnels.

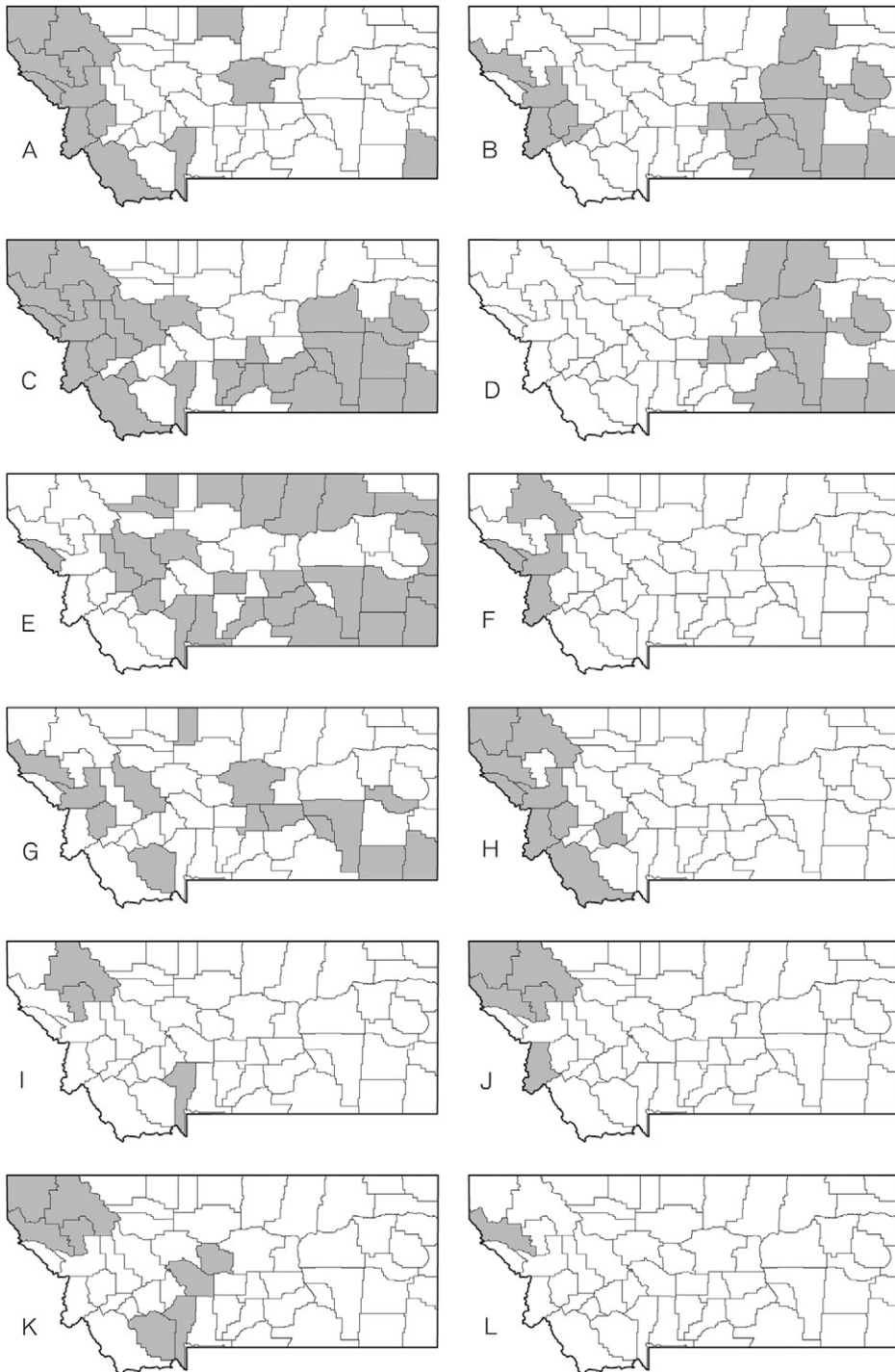
**County Records (Fig. 2B):** Big Horn (1), Carter (1), Dawson (1), Deer Lodge (1), Garfield (1), Golden Valley (10), Granite (5), Missoula (3), Musselshell (12), Powder River (1), Prairie (1), Ravalli (5), Rosebud (2), Sanders (1), Treasure (4), Valley (4), Yellowstone (1).

#### *Temnoscheila* Westwood, 1830

With 105 extant species distributed worldwide, the vast majority of *Temnoscheila* species occur in the Western Hemisphere (Kolibáč 2013). Their medium-to-large size and often shiny-green-to-purple dorsal coloration makes them the most easily observable trogossitids, and the most frequently encountered in museum collections. There are 10 species found across the United States, all of which are predatory, primarily on xylophagous beetles (Kolibáč 2013). A single species is found in Montana.

#### *Temnoscheila chlorodia* (Mannerheim, 1843)

This species is unquestionably the dominant *Temnoscheila* in the western United States and Canada; *T. chlorodia* is easily collected from freshly cut or downed pines, especially at night when adults



**Fig. 2.** Distribution of 12 species of bark-gnawing beetles by county in Montana. A) *Calityx scabra*, B) *Corticotomus caviceps*, C) *Temnoscheila chlorodia*, D) *Tenebroides collaris*, E) *Tenebroides corticalis*, F) *Tenebroides crassicornis*, G) *Tenebroides occidentalis*, H) *Tenebroides sinuatus*, I) *Peltis fraterna*, J) *Peltis pippingskoeldi*, K) *Peltis septentrionalis*, L) *Eronyxa angusta*.

emerge from their diurnal resting places (personal observation). Barron (1971) listed only two Montana locations, both within Sanders County; in contrast, the MTEC has 134 specimens representing 48 unique locales in 26 counties, 133 of which were collected after 1987. The absence of records from the central to the southwestern portion of the state is undoubtedly a collecting or sampling artifact (Fig. 2C). Barron (1971) did not record this species from either Wyoming or North Dakota, and reported only one record from western South Dakota, even though it appears to be well established in southeastern Montana. Of the specimens examined, 117 were collected by either funnel or vane traps with collecting labels indicating that many traps were baited with either EtOH and alpha-pinene or EtOH only.

**County Records (Fig. 2C):** Beaverhead (1), Big Horn (1), Carter (10), Cascade (4), Custer (3), Dawson (1), Flathead (2), Gallatin (1), Garfield (4), Golden Valley (2), Granite (2), Lake (1), Lewis and Clark (4), Lincoln (6), Mineral (31), Missoula (9), Powder River (23), Powell (1), Prairie (1), Ravalli (9), Rosebud (1), Sanders (8), Silver Bow (1), Stillwater (3), Sweet Grass (1), Treasure (2), Yellowstone (2).

#### *Tenebroides* Piller and Mitterpacher, 1783

The vast majority of the 145 extant species of this genus are recorded from the Western Hemisphere (Kolibáč 2013). Members of this genus can be challenging to identify, especially single specimens. All of the 18 Nearctic species are known to be predators of other insects (Barron 1971). Five species are now known from Montana.

#### *Tenebroides collaris* (Sturm, 1807), New State Record

Fig. 3

This unmistakable species is easily recognized by its combination of a depressed body with orange-red head and pronotum, and relatively smooth, black elytra (Fig. 3). Prior to records presented here, the distribution of *T. collaris* was listed as “Eastern United States, Ontario, west to Michigan, eastern Texas” by Barron (1971). The furthest northwestern US record documented by Barron (1971) was Alpena, Alpena County, Michigan, in the far northeastern portion of that state, while the furthest southwestern record was from Grayburg, Hardin Co., Texas. In Montana, this species is now known to occur in 12 counties in the eastern half of the state (Fig. 2D) and is represented by 41 specimens, all but one collected by Lindgren funnels. Available label data indicate that some funnels were baited with either EtOH or a combination of EtOH and alpha-pinene. The earliest records are from 1990 from both Carter and Rosebud counties.



**Fig. 3.** Dorsal habitus of *Tenebroides collaris* collected from a Lindgren funnel trap baited with ETOH and alpha-pinene, 1 mi. south of Ridge Rd., Carter County, Montana, 8 June to 20 July 2012, by Ivie and Foley (MTEC).

**County Records (Fig. 2D):** Big Horn (1), Carter (13), Dawson (3), Garfield (2), Golden Valley (1), Musselshell (1), Phillips (2), Powder River (4), Prairie (3), Rosebud (2), Treasure (7), Valley (2).

Additionally, during the course of identifying trogossitid specimens in 2020 for the C. P. Gillette Museum of Arthropod Diversity, Colorado State University, Fort Collins, Colorado, USA, the author discovered a specimen of *T. collaris* collected from Larimer County, Colorado which constitutes a **new state record**. The specimen was collected from *P. ponderosa* in 1996 (D. Leatherman, *in litt.*). A second Colorado specimen was collected approximately 128 km south southeast of the Larimer County record in Douglas County from a Colorado

Department of Agriculture Lindgren funnel baited with UHR EtOH and omega-pinene (C. Harp, *in litt.*).

***Tenebroides corticalis* (Melsheimer, 1844)**

This species has an extensive distribution throughout Canada and the United States southward into Mexico and Central America (Barron 1971). It is possible this species occurs in all of Montana. All but 19 of the 161 specimens examined were collected by either funnel or vane traps.

**County Records (Fig. 2E):** Big Horn (6), Blaine (3), Carter (27), Cascade (1), Custer (8), Fallon (5), Gallatin (4), Hill (19), Jefferson (4), Lewis and Clark (5), Mineral (1), Musselshell (1), Park (1), Phillips (2), Pondera (6), Powder River (2), Powell (5), Richland (24), Roosevelt (1), Rosebud (13), Stillwater (1), Toole (1), Valley (3), Wheatland (3), Wibaux (8), Yellowstone (7).

***Tenebroides crassicornis* (Horn, 1862),  
New State Record**

This species has a scattered distribution in the western United States as well as British Columbia, Canada and Baja California Sur, Mexico (Barron 1971). The seven Montana specimens were all collected west of the Continental Divide in the NFM ecoregion and appear to represent the eastern edge of its distribution in the United States. All specimens were collected by Lindgren funnel traps and it is interesting to note that only a single specimen was collected at each of seven different localities.

**County Records (Fig. 2F):** Flathead (2), Mineral (1), Missoula (1), Ravalli (3).

***Tenebroides occidentalis* Fall, 1910**

This species is morphologically very similar to *T. corticalis* and series of both species are often needed to distinguish the two. It is distributed in western Canada and the United States southward into Mexico (Barron 1971), and is probably more widespread in Montana than the scattered records indicate. Nineteen of 35 specimens were collected by either vane traps or Lindgren funnels; two were from blacklights, and six specimens from Carter County were "collected on dead and/or fungusy ponderosa pine".

**County Records (Fig. 2G):** Carter (13), Fergus (2), Golden Valley (5), Granite (1), Lewis and Clark (3), Liberty (1), Madison (1), Missoula (1), Musselshell (1), Powder River (1), Prairie (1), Rosebud (1), Sanders (3), Treasure (1).

***Tenebroides sinuatus* (LeConte, 1861)**

This species has a scattered distribution in the US and Canada west of the Great Plains. Twelve of 15 specimens were collected by either Lindgren funnel or vane traps, all from the forested Rocky Mountain NFM ecoregion. Hatch (1961)

recorded it from "under bark of *Tsuga heterophylla*, *Pseudotsuga taxifolia*, and *Pinus ponderosa*", all three of which have a scattered distribution throughout the NFM ecoregion (Little 1980).

**County Records (Fig. 2H):** Beaverhead (1), Flathead (1), Granite (1), Jefferson (1), Lincoln (1), Mineral (3), Missoula (1), Ravalli (2), Sanders (4).

**Peltidae Kirby, 1837**

***Peltis* Müller, 1764**

This genus is restricted to the Northern Hemisphere. Three species are known from the United States, none of which were recorded as occurring in Montana by Barron (1971, 1996). Barron's (1971) lack of Montana records, however, was most likely an artifact of collecting as he indicated that species of this genus are widely distributed in the western United States and Canada.

Barron (1996) reviewed Nearctic *Peltis* (as *Ostoma* Laicharting), and changed certain names he had used previously (Barron 1971): the Nearctic members of his 1971 Holarctic *Ostoma ferruginea* (Linnaeus) were recognized as *Ostoma fraternana* (Randall), while *Ostoma columbiana* Casey was placed as a junior synonym of *Ostoma septentrionalis* (Randall), thus leaving only *Ostoma pippingskoeldi* (Mannerheim) unchanged among the Nearctic fauna. Although Kolibáč (2013) cited Barron (1996), he missed these nomenclatural changes, and used Barron's (1971) interpretation in his checklist. This should be considered a *lapsus calami*, not a nomenclatural change, as Kolibáč (2013) did not include Barron (1996) in his synonymical table. I therefore follow Barron's (1996) species-level taxonomy here. Kolibáč (2013) stated that all species of *Peltis* are fungivorous.

***Peltis fraternana* Randall, 1838,  
New State Record**

This species has a broad distribution west of the Great Plains in the northern United States, and in the north across Canada (Barron 1996). Only four specimens from Montana were examined, and more can be expected throughout the NFM ecoregion.

**County Records (Fig. 2I):** Flathead (as *Ostoma ferruginea* in Russell 1968), Gallatin (3), Lake (1).

***Peltis pippingskoeldi* Mannerheim, 1852,  
New State Record**

Barron (1996) recorded the distribution of this species as "West of the Great Plains, British Columbia south to California, Arizona, and New Mexico" and apparently was unaware of a Lake County, Montana record (Russell 1968). All Montana records are from west of the Continental Divide. Of the 31 specimens, only two were

collected by Lindgren funnels with the other specimens apparently hand-collected.

**County Records (Fig. 2J):** Flathead (15), Lake (Russell 1968), Lincoln (7), Ravalli (5), Sanders (4).

***Peltis septentrionalis* Randall, 1838,  
New State Record**

Similar to the preceding *Peltis* species, this species has only been collected in western Montana but crosses to the east of the Continental Divide. Only one of the 20 specimens examined indicated it was trapped by Lindgren funnel, without indication of bait.

**County Records (Fig. 2K):** Flathead (3), Gallatin (7), Judith Basin (1), Lake (2), Lincoln (3), Madison (1), Meagher (2), Sanders (1).

**Lophocateridae Crowson, 1964**

***Eronyxa* Reitter, 1876**

This genus is comprised of three species, all of which are restricted to the western US and southern British Columbia, Canada. All are known to be associated with a variety of shrubs and trees (Barron 1971).

***Eronyxa angusta* Casey, 1916,  
New State Record**

A single specimen of this species was collected in 2018 in a Lindgren funnel without indication of bait in Sanders County (Fig. 2L). Barron (1971) recorded specimens from California, Oregon, Nevada, and Idaho where it is known to occur in ash (*Fraxinus* L.; Oleaceae) blossoms and on *P. ponderosa*. Barron's (1971) single Idaho record of "Kootenai Co., Coeur d' Alene" is approximately 152 km west of the Montana record.

**County Records (Fig. 2L):** Sanders (1).

**CONCLUSION**

My determinations of the MTEC material confirm the occurrence of 12 species of bark gnawing beetles in Montana. Two additional species, *T. mauritanicus* (the cadelle) and *Grynocharis oregonensis* (Schaeffer, 1918) (Lophocateridae), should occur in Montana. *Tenebroides mauritanicus* is a cosmopolitan and economically important stored-product pest known to feed on stored grain and grain products, cereals, nuts, and spices as well as stored-product pests (Campbell *et al.* 1989). *Grynocharis oregonensis* was recorded by Barron (1971) from California, Idaho, Nevada, Oregon, and Washington. While I am unaware of any Montana records for this species, Barron's (1971) single Idaho record of "Shoshone Co., Wallace, Sunset Park" is approximately 18 km west of the Montana border.

The geographical distributions of these small families of beetles are still incompletely known throughout North America, no doubt because of their relatively small size and specific ecologies. Most specimens examined were by-catch of Lindgren funnels and vane traps. It is noted that this by-catch is often discarded in bark and ambrosia beetle surveys. It is clearly evident that curating and depositing these beetles and others into collections such as MTEC can reveal new state records. For example, *T. collaris*, a relatively distinctive species previously believed to inhabit only the eastern third of the United States and now recorded from both Montana and Colorado, illustrates the importance of the western Great Plains/Rocky Mountain physiographic regions in understanding broader distributional patterns of these families. The paucity of records from states and provinces neighboring Montana highlights the need for future surveys for these families in the northern Great Plains.

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