

ECOLOGY OF THE CERAMBYCIDAE OF THE HURON MOUNTAINS  
PRELIMINARY REPORT - 1981 SEASON

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The Cerambycidae are woodboring beetles which typically feed as larvae beneath the bark of recently dead trees. Some species feed in wood which has begun to decay, and a few attack living trees. No cerambycids occurring in the Huron Mountains seem to be of any economic significance within the region. They are, however, among the more abundant forest insects and undoubtedly important as food for wildlife and in speeding the decay of dead wood.

This study seeks to add to our scant knowledge of the ecology of these beetles in northern forests. Of particular interest is the relationship between the cerambycid community and the process of forest succession. My previous research regarding this question has been limited by the lack of large, undisturbed stands of old trees; a deficiency now corrected by the opportunity to conduct research in the Huron Mountains.

## Historical Note

Several entomologists have previously collected in the Huron Mountains as guests of the Huron Mountain Club or the Huron Mountain Wildlife Foundation, but the only one to publish a record of beetles from the area was Arthur W. Andrews. Mr. Andrews was a cabinetmaker by trade, but also a noted authority on insects, especially beetles. He was very active in the Detroit Natural History Society<sup>1</sup> and was Associate Curator of Coleoptera at the University of Michigan Museum of Zoology.

Mr. Andrews collected in the Huron Mountains in July 1920, and prepared a typescript list of his records, a copy of which is in the Club Museum. This same list was published in 1929 in *The Book of Huron Mountain*, edited by B. H. Christy. It was presented, as the Editor noted, "not as an exhaustive catalogue, but as a list of a typical collection." Indeed, even for the cerambycids, a group he rather favored, Andrews recorded only 18 species.

Mr. Andrews also built three display cases, modifying the "double-Schmidt" boxes he made for his own collection<sup>2</sup> by adding glass covers.

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<sup>1</sup>An interesting photograph of members of the society on a field trip, including Andrews and Bryant Walker, a member of the Huron Mountain Club, appears on the cover of *The Great Lakes Entomologist*, 1979, Volume 12, Number 4.

<sup>2</sup>The double-Schmidt is a unique size of insect box used by the University of Michigan Museum of Zoology and adopted by Andrews.

He filled these cases with examples of all the insects he had collected at the Club, each keyed to the list with an appropriate number. Unfortunately he did not include any other data labels. This exhibit was presented to the Club and displayed for many years, suffering inevitable fading from exposure to light. It has now been relegated to the members' telephone room in the gate house. The scientific value of these specimens is not great, but they are of significance as "voucher specimens" when identifications by Andrews need to be verified by later workers. As such the collection merits preservation.

#### The 1981 Season

I was able to spend five weeks (30 June to 3 August) in the Huron Mountains this year. My objectives for this first season were to (1) determine what species of cerambycids occur in the region, and (2) become familiar with the appropriate habitats which are available there. With the assistance of Club staff and members, and generally good weather, I made very satisfactory progress toward these goals, and now have a good basis for planning the next stage of the study.

#### The Cerambycid Community

The diversity of the cerambycid community in the Huron Mountains exceeds my expectations, and is evidenced by the length of the list below. It would be premature to attempt estimates of abundance for most of the populations at this stage, but many of them seem sparse, as I had anticipated.

The following list includes the 70 species I have collected in the Huron Mountains region, as well as six species recorded by Andrews but not as yet found by me. Some of the species names used by Andrews in his list are now obsolete or, in one case, in error. To facilitate reference to his list I have noted these changes in nomenclature where appropriate. Species in this list are arranged alphabetically by the generic name and not in traditional systematic order.

Where host relationships have already been established by this study they are stated in the list, although additional hosts will no doubt be recorded in future reports. Where probable hosts can be inferred from records in other areas these are given parenthetically.

This list is by no means complete. Future collecting, especially earlier in the season, can be expected to add perhaps 10-15 species.

*Acmæops proteus* (Kirby). Host: dead pine.

*Acmæopsoides rufula* (Haldeman). (Probable host: spruce) This is a boreal species which is very rarely collected. The only previous records from Michigan are one from Isle Royale in 1878 and two specimens I found in Alger County a few years ago.

*Aegoschema modesta* (Gyllenhal). Host: dead apple branches.

*Amniscus macula* (Say). Host: dead oak branches.

*Amniscus sexguttatus* (Say). Host: dead branches of pine and spruce.

*Anastrangalia sanguinea* (LeConte). (Probable host: dead pine)

*Anthophylax cyaneus* (Haldeman). Host uncertain.

*Arhopalus foveicollis* (Haldeman). Recorded by Andrews but not found in the 1981 season. Host: dead pine stumps.

*Asemum striatum* (L.). Host: dead pine.

*Brachyleptura champlaini* Casey. Host unknown. The southern Michigan population of this species is dimorphic, but only the darker form has been found in the Huron Mountains.

*Brachyleptura rubrica* (Say). (Probable host: decayed oak). The Huron Mountains population of this species also differs in color from that in southern Michigan.

*Callimoxys sanguinicollis sanguinicollis* (Olivier). Host unknown.

*Calloides nobilis nobilis* (Harris). Recorded by Andrews but not found in the 1981 season. Host: dead oak.

*Centrodera decolorata* (Harris). (Probable host: dead oak).

*Charisalia americana* (Haldeman). Host unknown in this region.

*Clytus ruricola* (Olivier). Host: dead apple branches. This is a common species in the area and undoubtedly breeds in dead maple and other hardwoods.

*Cosmosalia chrysocoma* (Kirby). (Probable host: decaying conifers).

[*Criocephalus agrestis* = *Arhopalus foveicollis*]

*Cyrtophorus verrucosus* (Olivier). Host: dead apple branches. This borer undoubtedly breeds in other dead hardwoods, probably oak.

*Elaphidionoides parallelus* (Newman). No adults of this species were collected; they would have been active in June. This record is based on larvae and the characteristically pruned twigs of oak which were collected from several locations. Although not previously recorded from the Upper Peninsula, this borer seems rather common in the study area, particularly at higher elevations.

*Elaphidionoides villosus* (Fabricius). (Probable host: dead oak).

*Encyclops caerulea* (Say). (Probable host: decayed maple and oak).

*Eupogonius subarmatus* (LeConte). Host: dead basswood. This species has not been previously recorded from the Upper Peninsula.

*Evodinus monticola monticola* (Randall). (Probable host: decayed hemlock and pine).

*Gaurotes cyanipennis* (Say). (Probable host: dead oak).

*Graphisurus fasciatus* (DeGeer). Host: dead oak.

*Hoplosia nubila* (LeConte). Host: dead basswood. This species has not previously been recorded from the Upper Peninsula.

*Hyperplatys aspersa* (Say). Host: dead apple branches.

*Hyperplatys maculata* Haldeman. Host: dead basswood. This species has not previously been recorded from the Upper Peninsula.

*Idiopidonia pedalis* (LeConte). Host unknown.

*Judolia montivagans montivagans* (Couper). (Probable host: decayed pine and spruce).

[*Leptura canadensis* = *Stictoleptura canadensis*]

[*Leptura chrysocoma* = *Cosmosalia chrysocoma*]

[*Leptura nigrella* = *Pygoleptura nigrella*]

*Leptura plebeja* Randall. Host: dead pine.

[*Leptura proxima* = *Trigonarthris proxima*]

*Leptura subhamata* Randall. (Probable host: dead hemlock and pine).

[*Leptura tibialis* = *Xestoleptura tibialis*]

[*Leptura vagans*. An error by Andrews in identification; his specimen is *Brachyleptura champlaini*.]

*Lepturges symmetricus* (Haldeman). Host: dead basswood branches.

- Lepturoopsis biforis* (Newman). (Probable host: decayed conifers).
- Microgoes oculatus* (LeConte). Host: dead branches of oak and basswood.
- Monochamus notatus* (Drury). Host: dead pine.
- Monochamus scutellatus scutellatus* (Say). Hosts: dead pine, hemlock, fir, and spruce.
- Neacanthocinus pusillus* (Kirby). Host: dead pine.
- Neostalerna capitata* (Newman). Host unknown.
- Neoclytus acuminatus acuminatus* (Fabricius). Host: dead oak branches.
- Neoclytus muricatulus muricatulus* (Kirby). Host: dead fir.
- Oberea tripunctata* (Swederus). (Probable host: hardwood twigs).
- Orthosoma brunneum* (Forster). Recorded by Andrews but not found in the 1981 season. Host: decayed pine and spruce.
- [*Fachyta monticola* = *Evodinus monticola monticola*]
- Parandra brunnea brunnea* (Fabricius). Recorded by Andrews under the family Spondylidae; not found in the 1981 season. (Probable host: decayed oak or other hardwoods).
- Phymatodes dimidiatus* (Kirby). Host: dead pine.
- Phymatodes testaceus* (L.). Recorded by Andrews; not otherwise known from the Upper Peninsula. Host: dead oak.
- [*Phymatodes variabilis* = *Phymatodes testaceus*]
- Physoctenium brevilineum* (Say). Host: bark of living elm.
- Pidonia ruficollis* (Say). (Probable host: decayed aspen).
- Pogonocherus mixtus* Haldeman. Host: dead pine branches.
- Pogonocherus parvulus* LeConte. (Probable host: dead willow branches).

This species has previously been recorded in Michigan only from Oakland and Livingston counties in the southeastern part of the state.

*Pogonocherus penicillatus* LeConte. Host: dead spruce. This species was collected by Andrews in Chippewa County, the only previous record from Michigan.

*Pronocera collaris collaris* (Kirby). Host: dead pine.

*Purpuricenens humeralis* (Fabricius). Host: dead oak. This species has not previously been recorded from the Upper Peninsula.

*Pygoleptura nigrella nigrella* (Say). Host: dead pine.

*Rhagium inquisitor* (L.). Host: dead pine.

[*Rhagium lineatum* = *Rhagium inquisitor*]

*Saperda concolor unicolor* Felt & Joutel. Recorded by Andrews but not found in the 1981 season. Host: living willow.

*Saperda lateralis* Fabricius. (Probable host: dead oak or maple). This species has not been previously recorded from the Upper Peninsula.

*Saperda obliqua* Say. (Probable host: living alder and birch).

*Saperda tridentata* Olivier. Host: dead elm.

*Saperda vestita* Say. Host: dead basswood.

*Stenocorus vittiger* (Randall). Host unknown.

*Stictoleptura canadensis canadensis* (Olivier). (Probable host: dead hemlock and pine).

*Strangalepta abbreviata* (Germar). (Probable host: dead conifers and hardwoods).

*Strangalepta pubera* (Say). (Probable host: dead maple).

*Tetropium cinnamopteran parvulum* Casey.<sup>3</sup> Host: dead pine.

*Tetropium schwarziianum* Casey. Host: dead pine.

*Trachysida mutabilis* (Newman). (Probable host: decayed hardwoods).

*Trigonarthris minnesotana* (Casey). (Probable host: decayed birch).

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<sup>3</sup>These specimens may represent two species as redefined by Raske.



*Trigonarthris proxima* (Say). Host: dead elm.

*Typocerus sparsus* LeConte. (Probable host: decaying pine)

*Typocerus velutinus velutinus* (Olivier). (Probable host: decaying hardwoods).

*Urgleptes quercii* (Fitch). Hosts: dead branches of oak, maple, and basswood. This species has not previously been recorded from the Upper Peninsula.

*Urgleptes signatus* (LeConte). Host: dead branches of oak. This species has not previously been recorded from the Upper Peninsula.

*Xestoleptura tibialis* (LeConte). Host: dead pine.

*Xylotrechus colonus* (Fabricius). (Probable host: dead oak).

*Xylotrechus undulatus* (Say). Host: dead fir.

#### COMMENT

It is not surprising that the previous, rather casual collections by Andrews and others in the Huron Mountains and other locations in the Upper Peninsula, have recorded a disproportionate number of the larger, more easily collected species of cerambycids. In this respect the above list is not only more extensive, but also gives a more balanced picture of the cerambycid community. This bias in earlier records is well exemplified by the observation that nine (13%) of the species newly recorded from the Huron Mountains had not previously been found in the Upper Peninsula. Most of these seem to be relatively common in the area, and were presumably overlooked as a consequence of their small size and secretive habits.

Comparison between this list and that by Andrews also raises the question of changes in populations, especially as 6 (33%) of those recorded by Andrews were not found by me in 1981. It is quite possible that the abundance of some of these beetles has been affected by change in availability of suitable microhabitats. *Arhopalus foveicollis*, for example, breeds in the stumps of recently cut pines, a microhabitat which may have been more common in the area in 1920 than at present. There is no reason to believe at this time that any of these species is no longer present in the Huron Mountains. My failure to find them this season is more likely the result of chance, change in abundance, and differences in collecting methods.

Studies in southern Michigan have demonstrated rather rapid, northward expansion by some insect populations in the state, and it is possible that some of the species here reported by me as new to the Huron Mountains may have become established in the area since 1920. The available data, however, are insufficient to identify any such population movements in the Upper Peninsula.

#### ENDANGERED SPECIES

The problem of endangered species of plants and animals is a matter of considerable interest, although the survival abilities of most insects usually excludes them from such concerns. There is, however, a cerambycid population in the Huron Mountains area which seems to be endangered. *Physocnemum brevilineum* has the rather unusual habit, for a cerambycid, of feeding in the bark of living elm trees.

It is a medium-sized beetle, but only the heavy bark near the base of old, very large elm trees is thick enough for the larval galleries. There is no indication of any significant harm to the host tree from the activities of this borer, and until recently this species was apparently abundant in the area.

The arrival of Dutch elm disease has eliminated nearly all the older, large trees; the younger trees not affected by the disease do not have bark thick enough to support the borers. Only a few large trees survive at Ives Lake, and nearly all of these are already dying. I have been unsuccessful so far in finding large elms alive elsewhere. A single colony of these beetles survives in one of the trees at Ives Lake, but that is the only evidence I have found of them. It seems inevitable that the next few years will see the virtual extinction of this species in the Huron Mountain area.

#### FUTURE WORK

This first season has been very productive in suggesting a number of interesting problems for investigation as parts of the overall study, and highlighting some of the difficulties and limitations to be considered. The 1982 season should be used to (1) continue and extend the general survey of cerambycid communities in the various habitats, starting earlier in the summer, employing additional sampling methods, and including more habitat types; and (2) initiate relative sampling procedures between habitats where appropriate. I shall be working on the experimental design for these procedures through the winter.