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Flower Records for Anthophilous Cerambycidae in a Southwestern Michigan Woodland (Coleoptera)

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FLOWER RECORDS FOR ANTHOPHILOUS CERAMBYCIDAE IN A SOUTHWESTERN MICHIGAN WOODLAND (COLEOPTERA)

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ABSTRACT

Flower records are listed for 33 species of anthophilous Cerambycidae based on a six-year study in an 80-ha woodland in southwestern Michigan. Included is the first published flower record for *Gaurotes thoracica,* taken from *Cornus racemosa.*

The cerambycid community in a southwestern Michigan woodland was studied from 1976 through 1981 as the first stage in a long-term investigation of the ecology of Michigan Cerambycidae. Through field collections and observations, flower records were obtained for 33 species of anthophilous Cerambycidae.

STUDY AREA

The study area is an 80-ha site located at the west end of Tamarack Lake in St. Joseph County, selected as typical of woodland ecosystems in southwestern Michigan. Almost two-thirds of the area is dry-mesic forest dominated by oak and hickory, with some reforestation plantings of pines. The rest of the site supports wet-mesic stands dominated by maple and ash, with birch, oak, and larch. (Detailed information on the study area, with descriptions of the major stands and an annotated list of 120 species of woody plants found there, was presented by Gosling [1981]).

All the stands are second-growths and some of the regeneration is recent. About 6 ha were old fields occupied by shrub and herbaceous plant communities as late as the 1950's, and nearly 20 ha were severely disturbed in 1963–1964 by selective logging. Because of the recent and, to a limited extent, continuing disturbances, as well as the maintenance of clearings and access roads and the presence of two bogs, there are numerous and varied sites available for establishment of flowering shrubs and herbs favored by cerambycids. This, combined with availability of a wide selection of larval host plants, made it possible to compile a substantial list of flower records for the anthophilous species.

The following list gives flower records for each species, and the adult activity period in the area.

CERAMBYCIDAE AND FLOWER RECORDS

Analeptura lineola (Say). Late May to mid-July. *Ceanothus americanus* L., *Cornus racemosa* Lam., *Daucus carota* L., *Rhus glabra* L., *Salix interior* Rowlee, and *Viburnum acerifolium* L.

Anastrangalia sanquinea (LeConte). Early June. *Cornus racemosa.*

Batyle suturalis suturalis (Say). Early to mid-July. *Ceanothus americanus, Chrysanthemum leucanthemum* L. and *Rudbeckia hirta* L.

Brachyleptura champlaini Casey. Mid-June to mid-July. *Achillea millefolium* L.,

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Ceanothus americanus, Cornus racemosa, Euonymus fortunei var. *radicans* (Miq.) Rehd., and *Rhus glabra.*

Brachyleptura rubrica (Say). Mid-June to mid-July. *Ceanothus americanus, Cephalanthus occidentalis* L., *Cornus racemosa, Euonymus fortunei* var. *radicans, Heracleum maximum* Bartr., *Rhus glabra, Rosa* spp., *Salix interior, Spiraea alba* DuRoi, and *Viburnum acerifolium.*

Callimoxys sanguinicollis sanguinicollis (Olivier). Late May. *Cornus alternifolia* L.f.

Charisalia americana (Haldeman). Mid-June. *Cornus racemosa.*

Cyrtophorus verrucosus (Olivier). Late April to early July. *Amelanchier arborea* (Michx. f.) Fern., *Cornus alternifolia, C. racemosa, Daucus carota, Spiraea* ×*vanhouttei* Zab., *Viburnum acerifolium,* and *Viburnum lentago* L.

Encyclops caerulea (Say). Late May through June. *Cornus alternifolia* and *C. racemosa.*

Euderces picipes picipes (Fabricius). Mid-June to late July. *Ceanothus americanus, Chrysanthemum leucanthemum, Cornus racemosa, Erigeron philadelphicus* L., *Rhus glabra, Rudbeckia hirta, Salix interior,* and *Viburnum acerifolium.*

Gaurotes cyanipennis (Say). May to mid-July. *Ceanothus americanus, Cornus alternifolia, C. racemosa, Liriodendron tulipifera* L., *Rhus glabra, Rhus typhina* L., and *Rosa palustris* Marsh.

Gaurotes thoracica (Haldeman). June. *Cornus racemosa.*

Grammoptera haematites (Newman). Late May to early July. *Ceanothus americanus, Cornus alternifolia, C. racemosa, Cornus stolonifera* Michx., *Rhus glabra, Rosa* sp., and *Rubus occidentalis* L.

Leptura plebeja Randall. Late June and early July. *Ceanothus americanus* and *Cornus racemosa.*

Megacyllene robiniae (Forster). Late August through September. *Solidago canadensis* L.

Molorchus bimaculatus bimaculatus Say. May to mid-June. *Amelanchier arborea, Aronia prunifolia* (Marsh.) Rehd., *Cornus alternifolia, C. racemosa, C. stolonifera, Spiraea* ×*vanhouttei,* and *Viburnum acerifolium.*

Neoalosterna capitata (Newman). Late May through mid-June. *Liriodendron tulipifera.*

Pseudostrangalia cruentata (Haldeman). Mid-June. *Cornus racemosa.*

Rhopalophora longipes longipes (Say). Mid-June to early July. *Ceanothus americanus* and *Liriodendron tulipifera.*

Strangalepta abbreviata (Germar). Early June to mid-July. *Ceanothus americanus, Cornus racemosa, Erigeron philadelphicus, Rhus glabra, Rosa* spp., *Salix interior,* and *Viburnum acerifolium.*

Strangalepta pubera (Say). Late May to early July. *Ceanothus americanus, Cornus alternifolia, C. racemosa,* and *Spiraea* ×*vanhouttei.*

Strangalia acuminata (Olivier). Early July. *Ceanothus americanus.*

Strangalia bicolor (Swederus). Mid-June to mid-July. *Ceanothus americanus, Cornus racemosa,* and *Rosa* spp.

Strangalia famelica solitaria Haldeman. Late June to early August. *Ceanothus americanus, Cephalanthus occidentalis, Chrysanthemum leucanthemum, Daucus carota, Erigeron philadelphicus, Heracleum maximum, Rhus glabra, Rosa* spp., *Rudbeckia hirta, Salix interior,* and *Spiraea alba.*

Strangalia luteicornis (Fabricius). Late June through July. *Ceanothus americanus, Cephalanthus occidentalis, Daucus carota, Heracleum maximum, Rhus glabra, Rosa* spp., and *Spiraea alba.*

Strophiona nitens (Forster). Mid-June to early July. *Ceanothus americanus.*

Trachysida mutabilis (Newman). Late May through mid-June. *Cornus racemosa.*

Trigonarthris minnesotana (Casey). Late June and early July. *Ceanothus americanus, Cornus racemosa,* and *Rhus glabra.*

Trigonarthris proxima (Say). Mid-June. *Cornus racemosa.*

Typocerus acuticauda acuticauda Casey. Mid-July. *Rosa palustris.*

Typocerus deceptus Knull. July. *Ceanothus americanus, Cephalanthus occidentalis, Daucus carota,* and *Rosa palustris.*

Typocerus lugubris (Say). Late June through July. *Ceanothus americanus, Daucus carota, Rhus glabra,* and *Rosa* spp.

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Typocerus velutinus velutinus (Olivier). Mid-June to early August. *Ceanothus americanus, Cephalanthus occidentalis, Daucus carota, Eupatorium perfoliatum* L., *Euphorbia corollata* L., *Heracleum maximum, Monarda fistulosa* L., *Rhus glabra, Rosa* spp., *Salix interior, Spiraea alba, Spiraea tomentosa* L., and *Verbascum thapsus* L.

DISCUSSION

The cerambycids in this list are from the Lepturinae and a few tribes of Cerambycinae; no other subfamilies are represented. The three species of *Tetraopes* found in the study area do occasionally appear on the flowers of their host plants, *Asclepias syriaca* L. and *Asclepias tuberosa* L., but they consume the entire blossom and have been excluded here as not strictly anthophilous. A single specimen of *Oberea tripunctata* (Swederus) was collected from a blossom of *Cornus racemosa,* but was also excluded as it was not established as feeding there.

One of the functions of pollen-feeding often suggested for these cerambycids is to meet nutritional requirements for reproductive maturation. For example, Dusham (1921) observed adults of *Megacyllene caryae* (Gahan) feeding on pollen from flowers of *Crataegus* sp., and found that it was necessary to provide these flowers to obtain successful breeding by captive adults. Deprived of *Crataegus* pollen the beetles copulated but no oviposition occurred and they died in 3–4 days.

Crataegus spp. occur but rarely blossom in the study area. Although *Megacyllene caryae* is common in the area, it was never observed feeding on these or other flowers. It is possible, of course, that adults could feed on pollen from flowers of the taller trees and remain unobserved.

As a test of the importance of pollen-feeding to this species, five pairs of freshly emerged adults were transferred to a screened enclosure and provided with bolts of their host plant, *Carya glabra* (Miller) Sweet. The bolts had been cut a few days before and placed immediately in the breeding cage. The beetles died in 5–7 days but did oviposit, and a subsequent brood of borers was reared from the bolts. It would seem that pollen is not essential for reproductive maturation by *Megacyllene caryae,* although it is quite possible that pollen-feeding enhances fecundity and may promote longevity as well. The function of this behavior in other anthophilous species awaits further investigation.

The most unusual observation was that of *Brachyleptura rubrica* and *Brachyleptura champlaini* feeding on pollen from *Euonymus fortunei* var. *radicans*. These were the only cerambycids ever found on these flowers, and they displayed an extraordinary, intoxicated behavior, presumably induced by something ingested from the blossoms. The beetles were incapable of flight or coordinated movement; if placed on their backs they could only quiver their legs helplessly. A few males appeared unaffected, but they were copulating with females and probably had been thus occupied since their arrival at the flowers. All females and single males were immobilized. Other insects frequenting the same flowers, cantharids and numerous Hymenoptera and Diptera, seemed quite unaffected. Adults of both species of cerambycid were removed and kept under observation in an enclosure. It was not until the following day that they recovered normal coordination and were able to crawl and fly.

The nature of the intoxicating agent is unknown, but its function provides an opportunity for speculation. There would seem to be no adaptive value in immobilizing a potential pollinator, so presumably this is an incidental side-effect of a selective attraction mechanism to which these cerambycids have responded atypically. It is interesting to note that only these two congeneric species have shown this probably nonadaptive behavior, and that the flower species involved is an introduced ornamental one.

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