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CERAMBYCID HOST PLANTS IN A SOUTHWESTERN MICHIGAN WOODLAND (COLEOPTERA: CERAMBYCIDAE)D. C. L. Gosling¹

ABSTRACT

Host plant associations are listed for 61 species of Cerambycidae based on a six-year study in an 80-ha woodland in southwestern Michigan.

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, and extensive rearing, host plant associations were established for 61 of the 119 species recorded from the study area. Probable hosts for another 45 species could be inferred from the literature but are not included here.

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. About 50 ha are uplands formed by glacial kames and outwash, with well-drained, loamy sand soils. The remainder is nearly level, less than 1 m above lake elevation, and has poorly drained organic or sand soils. The uplands support a dry woods dominated by *Quercus velutina*, *Quercus alba*, and *Carya glabra*. Some north slopes are dominated by *Quercus rubra* and *Acer rubrum*. The poorly drained wet woods are dominated by *Acer rubrum*, *Betula alleghaniensis*, *Fraxinus pennsylvanica*, and *Quercus bicolor*, with some stands of *Larix laricina*. Reforestation plantings of *Pinus* spp., now well mixed with hardwood regeneration, occupy about 8 ha of the uplands. All the stands are second-growths and reflect a variety of forms of prior disturbance as well as differences in subsequent regeneration time. About half the study area has been relatively undisturbed since 1928. (Detailed information on the site, with descriptions of the major stands and an annotated list of 120 species of woody plants found there, was presented by Gosling [1981a]).

METHODS

Host plant associations were established through one or more of three methods:

- 1) Dead or dying branches of woody plants were sampled by beating. If a species of

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cerambycid was collected more than twice from branches of a particular plant species, or was taken from a known preferred host, it was assumed to be breeding in that host plant.

2) Trees were cut in the spring and bolts removed and placed in the major stands throughout the study area. Most bolts were supported off the ground by wiring them against suitable trees. Where practical, bolts were frequently inspected, both by day and at night, and cerambycids that had been attracted to them were collected. Criteria used to establish host plant associations were similar to those described for dead branches.

3) At the end of the summer bolts were gathered and enclosed for rearing. Suitable host material was also collected from any trees that had been felled for other purposes, as well as windfalls and storm-damaged trees. Separate lots of host material were enclosed in 60-cm-square screen cages and maintained outdoors in a wooded area about 5 km away. The cages were inspected regularly through subsequent seasons and emerged adults removed. All host material was enclosed for at least two years following exposure to infestation, and some lots were caged through four seasons. Space limitations made it impractical to provide prolonged enclosure for all the material collected.

RESULTS

Twenty-one species of potential host plants were used in the bolt sampling, and these plus five additional species were investigated through rearing. Of the 26 species involved, 21 were eventually associated with one or more species of Cerambycidae. Seventeen more host plant associations were established through field collections and observations. Table 1 lists all 38 cerambycid host plants from the study area and the species associated with them.

The host plant associations established for 61 species of Cerambycidae from the study area are shown in the following list. Also given are the normal adult activity period in this area and, where determined, the typical length of the life cycle for each species. When more than one host plant is listed, an * following the plant name is used to designate those that seemed to be the preferred host or hosts for that cerambycid. In a few cases no marked host preference was apparent.

CERAMBYCIDAE AND ASSOCIATED HOST PLANTS

Aegoschema modesta (Gyllenhal). Reared from *Acer rubrum* branches. Taken from dead *Carpinus caroliniana*. Late June to late July. Life cycle requires two years.

Amniscus collaris Haldeman. Beaten from dead branches of *Quercus velutina*. Mid-June through July.

Amniscus macula (Say). Reared from *Toxicodendron radicans**, *Tilia americana**, *Acer rubrum*, *Carpinus caroliniana*, *Carya glabra*, *Juglans cinerea*, and *Cornus florida*. Beaten from dead branches of *Liriodendron tulipifera*, *Rhus glabra*, *Toxicodendron vernix*, and *Quercus velutina*. Late May through mid-August. Life cycle requires one year.

Amniscus sexguttata (Say). Reared from *Larix laricina*, *Pinus resinosa*, and *P. banksiana*. Mid-June to late August. Life cycle requires one year. Three specimens were reared from *Toxicodendron radicans*. Selection of this atypical host by a gymnospermophagous species may have resulted from the vine clinging to the bark of a recently cut *Larix laricina* that had attracted many adult beetles.

- Asemum striatum* (L.). Reared from *Pinus resinosa** and *Larix laricina*. June. Life cycle requires two years.
- Astyleiopus variegatus* (Haldeman). Beaten from dead branches of *Rhus glabra*. Late June through mid-July.
- Callidium frigidum* Casey. Reared from *Juniperus virginiana*. Late May through June. Life cycle requires two years.
- Clytoleptus albofasciatus* (Castelnau and Gory). Reared from *Vitis riparia*. July through mid-August. Life cycle requires one year. Caged adults will infest old bolts.
- Cyrtophorus verrucosus* (Olivier). Reared from *Carya glabra*. Late April to early July. Life cycle requires two years.
- Desmocerus palliatus* (Forster). Beaten from living *Sambucus canadensis*. Mid-June.
- Ecyrus dasycerus* (Say). Taken from dead *Carya glabra* and dead branches of *Quercus velutina**, *Celtis tenuifolia*, and *Ulmus americana*. Late June through July.
- Elaphidion mucronatum* (Say). Reared from branches of *Acer rubrum*. Early July. Life cycle requires three years.
- Elaphidionoides parallelus* (Newman). Reared from pruned twigs of *Quercus velutina**, *Q. rubra**, *Q. alba*, and *Carya glabra*. Late May to early July. Life cycle requires two years and adults are usually present only in odd-numbered years (Gosling 1978).
- Elaphidionoides villosus* (Fabricius). Reared from bolts of *Carya glabra**, and branches of *Tilia americana**, *Cercis canadensis**, *Acer rubrum*, and *Toxicodendron radicans*. Beaten from dead branches of *Quercus velutina* and *Carpinus caroliniana*. Mid-June through July. Life cycle requires two years and adults are usually present only in odd-numbered years (Gosling 1978). All host material was 2 cm in diameter or larger. This species has been commonly but incorrectly known as the oak twig pruner through confusion with a sibling species, *E. parallelus* (Gosling 1981b).
- Euderes picipes picipes* (Fabricius). Reared from *Cercis canadensis**, *Acer rubrum*, and *Carya glabra*. Beaten from dead branches of *Cornus florida* and *Quercus velutina*. Mid-June to late July. Life cycle requires two years.
- Eupogonius subarmatus* (LeConte). Reared from *Tilia americana*. Mid-June to early August. Life cycle requires two years.
- Eupogonius tomentosus* (Haldeman). Reared from *Pinus banksiana* branches. Beaten from dead branches of *P. resinosa*. Late June to early August. Life cycle requires two years.
- Eupogonius vestitus* (Say). Reared from *Cornus florida**, *Acer rubrum*, and *Toxicodendron radicans*. Beaten from dead branches of *Rhus glabra*, *Toxicodendron vernix*, and *Cornus racemosa*, and stump sprouts of *Tilia americana*. Mid-June through July. Life cycle requires two years.
- Gaurotes cyanipennis* (Say). Beaten from dead branches of *Cornus florida* and *Rhus glabra*. May to mid-July.
- Grammoptera exigua* (Newman). Reared from *Tilia americana* branches. Late May through June. Life cycle requires one year.
- Graphisurus despectus* (LeConte). Reared from *Carya glabra*. Mid-June to mid-July. Life cycle requires one year.
- Graphisurus fasciatus* (DeGeer). Reared from *Quercus velutina**, *Carya glabra*, *Carpinus caroliniana*, and *Toxicodendron radicans*. Beaten from dead branches of *Acer rubrum*. Early June through July. Life cycle requires one year. Previously published report (Gosling and Gosling 1977) of rearing this species from *Pinus strobus* was in error.

- Heterachthes quadrimaculatus* Haldeman. Reared from *Carya glabra**. Taken from dead *Quercus velutina* and *Carpinus caroliniana*. Mid-June to early August. Life cycle requires two years. Previously published observations (Gosling 1981a) of a one-year life cycle were atypical. Caged adults will infest old bolts.
- Hetoemis cinerea* (Olivier). Reared from *Carya glabra*. Adults feed on foliage of *Morus alba*. Mid-June to early August. Life cycle requires one year.
- Hyperplatys aspersa* (Say). Beaten from dead branches of *Rhus glabra*. Early June through July.
- Hyperplatys maculata* Haldeman. Reared from *Tilia americana**, *Carpinus caroliniana**, and *Cornus florida*. Beaten from dead branches of *Liriodendron tulipifera* and *Rhus glabra*. Late June to early September. Life cycle requires one year.
- Leptostylus transversus transversus* (Gyllenhal). Reared from *Toxicodendron radicans**, *Tilia americana*, and *Acer rubrum*. Taken from dead *Carya glabra*, *Quercus velutina*, *Rhus glabra*, and *Carpinus caroliniana*. Early June to mid-August. Life cycle requires one year.
- Lepturges confluens* (Haldeman). Reared from *Carya glabra*. Beaten from dead branches of *Cornus florida*. Mid-June through July. Life cycle requires one year.
- Lepturges symmetricus* (Haldeman). Reared from branches of *Tilia americana*. Late June through July. Life cycle requires two years.
- Megacyllene caryae* (Gahan). Reared from *Carya glabra** and *Cercis canadensis*. Early May through July. Life cycle requires one year.
- Molorchus bimaculatus bimaculatus* Say. Reared from *Acer rubrum**, *Carya glabra*, and *Vitis riparia*. May to mid-June. Life cycle requires two years.
- Monochamus carolinensis* (Olivier). Reared from *Pinus resinosa**. Taken from dead *Pinus strobus* and *P. banksiana*. Late June to mid-August. Life cycle requires one year.
- Monochamus scutellatus scutellatus* (Say). Reared from *Pinus resinosa*, *P. banksiana*, and *Larix laricina*. Taken from dead *P. strobus*. June to early July. Life cycle requires one year.
- Neoclytus acuminatus acuminatus* (Fabricius). Reared from *Cercis canadensis**, *Carya glabra**, *Tilia americana**, *Vitis riparia**, *Acer rubrum*, *Carpinus caroliniana*, and *Toxicodendron radicans*. Beaten from dead *Sambucus canadensis*. Late May through August. Life cycle varies from one to two years.
- Neoclytus muricatus muricatus* (Kirby). Reared from *Larix laricina*. July. Life cycle requires two years.
- Oberea bimaculata* (Olivier). Characteristic girdling was common on cultivated *Rubus idaeus*. Mid-June to late July.
- Oberea ocellata* (Haldeman). Beaten from living *Rhus glabra**, *R. typhina*, and *Toxicodendron vernix*. Characteristic girdling was observed on these host species and also on *R. copallina*. Late June through July.
- Obrium rufulum* Gahan. Taken from dead *Fraxinus pennsylvanica*. July.
- Oplasia nubila* (LeConte). Beaten from dead branches of *Tilia americana*. Early July.
- Parandra brunnea brunnea* (Fabricius). Reared from *Quercus velutina*. July.
- Phymatodes amoenus* (Say). Reared from *Vitis riparia*. Late May to mid-June. Life cycle requires one year.
- Phymatodes testaceus* (L.). Reared from *Carya glabra*. June. Life cycle requires two years.

- Pogonocherus mixtus* Haldeman. Reared from *Larix laricina** and *Pinus resinosa*. Mid-June through July. Life cycle requires two years.
- Psenocerus supernotatus* (Say). Reared from *Parthenocissus quinquefolia** and *Toxicodendron radicans*. Beaten from dead branches of *Cornus florida**, *Rhus glabra**, *R. typhina**, *Carya glabra*, *Catalpa speciosa*, *Lindera benzoin*, *Morus alba*, and *Quercus velutina*. Late May to mid-July. Life cycle requires one year.
- Rhopalophora longipes longipes* (Say). Reared from *Cercis canadensis* branches. Mid-June to early July. Life cycle requires two years.
- Saperda discoidea* Fabricius. Reared from *Carya glabra*. Mid-June through July. Life cycle requires two years.
- Saperda lateralis* Fabricius. Reared from *Carpinus caroliniana* and *Carya glabra*. Late May through July.
- Saperda puncticollis* Say. Reared from *Parthenocissus quinquefolia*. June. Life cycle requires one year.
- Saperda vestita* Say. Reared from *Tilia americana*. Early June to early August. Life cycle requires one year.
- Sarosthes fulminans* (Fabricius). Reared from *Quercus velutina*. Late May through June. Life cycle varies from one to two years.
- Stenosphenus notatus* (Olivier). Reared from *Carya glabra*. May. Life cycle requires two years. Caged adults will infest old bolts.
- Sternidius alpha misellus* (LeConte). Reared from *Acer rubrum** branches. Beaten from dead branches of *Rhus glabra**, *R. typhina*, *Quercus velutina*, and *Ulmus americana*. Mid-June to mid-August. Life cycle requires one year.
- Strangalepta pubera* (Say). Reared from *Acer rubrum* branches. Late May to early July. Life cycle requires one year.
- Tetraopes femoratus* LeConte. Taken from living *Asclepias syriaca*. July.
- Tetraopes quinquemaculatus* Haldeman. Taken from living *Asclepias tuberosa** and *A. syriaca*. Late June through July.
- Tetraopes tetrophthalmus* (Forster). Taken from living *Asclepias syriaca*. July.
- Urgleptes facetus* (Say). Beaten from dead branches of *Acer rubrum*, *Cornus florida*, *Lindera benzoin*, and *Rhus glabra*. Late June through July.
- Urgleptes querci* (Fitch). Reared from *Acer rubrum**, *Carya glabra*, *Cercis canadensis*, *Tilia americana*, and *Liriodendron tulipifera*. Beaten from dead branches of *Carpinus caroliniana*, *Cornus alternifolia*, *C. florida*, *Fraxinus pennsylvanica*, *Lindera benzoin*, *Morus alba*, *Prunus serotina*, *Quercus velutina*, *Rhus glabra*, *R. typhina*, *Toxicodendron vernix*, *Ulmus americana*, *Vaccinium corymbosum*, and *Viburnum acerifolium*. Mid-June through July. Life cycle requires two years.
- Urgleptes signatus* (LeConte). Taken from dead *Carpinus caroliniana*, *Cornus florida*, and *Quercus velutina*; beaten from dead branches of *Carya glabra*, *Acer rubrum*, and *Cornus alternifolia*. and from stump sprouts of *Tilia americana*. Late June through early August.
- Xylotrechus colonus* (Fabricius). Reared from *Carya glabra** and *Carpinus caroliniana*. Taken from dead *Quercus velutina*. Early June through August. Life cycle varies from one to two years. Caged adults will infest old bolts.
- Xylotrechus undulatus* (Say). Reared from *Larix laricina*. Late June to early July. Life cycle varies from one to two years.

Table 1. Host plants from the study area and cerambycid species associated with them. An * preceding a cerambycid species indicates the associated plant is a preferred host or the only one recorded for that species.

Host plant	
Cerambycid	Cerambycid
<i>Acer rubrum</i> L.	
<i>Aegoschema modesta</i>	* <i>Molorchus b. bimaculatus</i>
<i>Amniscus macula</i>	<i>Neoclytus a. acuminatus</i>
* <i>Elaphidion mucronatum</i>	* <i>Sternidius alpha misellus</i>
<i>Elaphidionoides villosus</i>	* <i>Strangalepta pubera</i>
<i>Euderces p. picipes</i>	<i>Urgleptes facetus</i>
<i>Eupogonius vestitus</i>	* <i>U. querci</i>
<i>Graphisurus fasciatus</i>	<i>U. signatus</i>
<i>Leptostylus t. transversus</i>	
<i>Asclepias syriaca</i> L.	
* <i>Tetraopes femoratus</i>	* <i>T. tetrophthalmus</i>
<i>T. quinquemaculatus</i>	
<i>Asclepias tuberosa</i> L.	
* <i>Tetraopes quinquemaculatus</i>	
<i>Carpinus caroliniana</i> Walter	
<i>Aegoschema modesta</i>	<i>Leptostylus t. transversus</i>
<i>Amniscus macula</i>	<i>Neoclytus a. acuminatus</i>
<i>Elaphidionoides villosus</i>	<i>Saperda lateralis</i>
<i>Graphisurus fasciatus</i>	<i>Urgleptes querci</i>
<i>Heterachthes quadrimaculatus</i>	<i>U. signatus</i>
* <i>Hyperplatys maculata</i>	<i>Xylotrechus colonus</i>
<i>Carya glabra</i> (Miller) Sweet	
<i>Amniscus macula</i>	* <i>Megacyllene caryae</i>
* <i>Cyrtophorus verrucosus</i>	<i>Molorchus b. bimaculatus</i>
<i>Ecyrus dasycerus</i>	* <i>Neoclytus a. acuminatus</i>
<i>Elaphidionoides parallelus</i>	* <i>Phymatodes testaceus</i>
* <i>E. villosus</i>	<i>Psenocerus supernotatus</i>
<i>Euderces p. picipes</i>	* <i>Saperda discoidea</i>
* <i>Graphisurus despectus</i>	<i>S. lateralis</i>
<i>G. fasciatus</i>	* <i>Stenosphenus notatus</i>
* <i>Heterachthes quadrimaculatus</i>	<i>Urgleptes querci</i>
* <i>Hetoemis cinerea</i>	<i>U. signatus</i>
<i>Leptostylus t. transversus</i>	* <i>Xylotrechus colonus</i>
<i>Lepturges confluens</i>	
<i>Catalpa speciosa</i> Warder	
<i>Psenocerus supernotatus</i>	
<i>Celtis tenuifolia</i> Nuttall	
<i>Ecyrus dasycerus</i>	
<i>Cercis canadensis</i> L.	
* <i>Elaphidionoides villosus</i>	* <i>Neoclytus a. acuminatus</i>
* <i>Euderces p. picipes</i>	* <i>Rhopalophora l. longipes</i>
<i>Megacyllene caryae</i>	<i>Urgleptes querci</i>

Table 1. (Continued)

Host plant	
Cerambycid	Cerambycid
	<i>Cornus alternifolia</i> L.f.
<i>Urgleptes querci</i>	<i>U. signatus</i>
	<i>Cornus florida</i> L.
<i>Amniscus macula</i>	<i>Lepturges confluens</i>
<i>Euderces p. picipes</i>	* <i>Psenocerus supernotatus</i>
* <i>Eupogonius vestitus</i>	<i>Urgleptes facetus</i>
<i>Gaurotes cyanipennis</i>	<i>U. querci</i>
<i>Hyperplatys maculata</i>	<i>U. signatus</i>
	<i>Cornus racemosa</i> Lamarck
<i>Eupogonius vestitus</i>	
	<i>Fraxinus pennsylvanica</i> Marshall
* <i>Obrium rufulum</i>	<i>Urgleptes querci</i>
	<i>Juglans cinerea</i> L.
<i>Amniscus macula</i>	
	<i>Juniperus virginiana</i> L.
* <i>Callidium frigidum</i>	
	<i>Larix laricina</i> (Du Roi) K. Koch
<i>Amniscus sexguttata</i>	<i>Pogonocherus mixtus</i>
<i>Monochamus s. scutellatus</i>	<i>Xylotrechus undulatus</i>
* <i>Neoclytus m. muricatus</i>	
	<i>Lindera benzoin</i> (L.) Blume
<i>Psenocerus supernotatus</i>	<i>U. querci</i>
<i>Urgleptes facetus</i>	
	<i>Liriodendron tulipifera</i> L.
<i>Amniscus macula</i>	<i>Urgleptes querci</i>
<i>Hyperplatys maculata</i>	
	<i>Morus alba</i> L.
* <i>Hetoemis cinerea</i>	<i>Urgleptes querci</i>
<i>Psenocerus supernotatus</i>	
	<i>Parthenocissus quinquefolia</i> (L.) Planchon
* <i>Psenocerus supernotatus</i>	* <i>Saperda puncticollis</i>
	<i>Pinus banksiana</i> Lambert
<i>Amniscus sexguttata</i>	<i>Monochamus carolinensis</i>
<i>Eupogonius tomentosus</i>	<i>M. s. scutellatus</i>
	<i>Pinus resinosa</i> Aiton
<i>Amniscus sexguttata</i>	* <i>Monochamus carolinensis</i>
* <i>Asemum striatum</i>	<i>M. s. scutellatus</i>
<i>Eupogonius tomentosus</i>	<i>Pogonocherus mixtus</i>

Table 1. (Continued)

Host plant	
Cerambycid	Cerambycid
	<i>Pinus strobus</i> L.
<i>Monochamus carolinensis</i>	<i>M. s. scutellatus</i>
	<i>Prunus serotina</i> Ehrhart
<i>Urgleptes querci</i>	
	<i>Quercus alba</i> L.
<i>Elaphidionoides parallelus</i>	
	<i>Quercus rubra</i> L.
<i>Elaphidionoides parallelus</i>	
	<i>Quercus velutina</i> Lamarck
* <i>Amniscus collaris</i>	<i>Leptostylus t. transversus</i>
<i>A. macula</i>	* <i>Parandra b. brunnea</i>
* <i>Ecyrus dasycerus</i>	<i>Psenocerus supernotatus</i>
* <i>Elaphidionoides parallelus</i>	* <i>Sarosesthes fulminans</i>
<i>E. villosus</i>	<i>Sternidius alpha misellus</i>
<i>Euderces p. picipes</i>	<i>Urgleptes querci</i>
* <i>Graphisurus fasciatus</i>	<i>U. signatus</i>
<i>Heterachthes quadrimaculatus</i>	<i>Xylotrechus colonus</i>
	<i>Rhus copallina</i> L.
<i>Oberea ocellata</i>	
	<i>Rhus glabra</i> L.
<i>Amniscus macula</i>	<i>Leptostylus t. transversus</i>
* <i>Astyleiopus variegatus</i>	* <i>Oberea ocellata</i>
<i>Eupogonius vestitus</i>	* <i>Psenocerus supernotatus</i>
<i>Gaurotes cyanipennis</i>	* <i>Sternidius alpha misellus</i>
* <i>Hyperplatys aspersa</i>	<i>Urgleptes facetus</i>
<i>H. maculata</i>	<i>U. querci</i>
	<i>Rhus typhina</i> L.
<i>Oberea ocellata</i>	<i>Sternidius alpha misellus</i>
<i>Psenocerus supernotatus</i>	<i>Urgleptes querci</i>
	<i>Rubus idaeus</i> L.
* <i>Oberea bimaculata</i>	
	<i>Sambucus canadensis</i> L.
* <i>Desmocerus palliatus</i>	<i>Neoclytus a. acuminatus</i>
	<i>Tilia americana</i> L.
* <i>Amniscus macula</i>	* <i>Lepturges symmetricus</i>
* <i>Elaphidionoides villosus</i>	* <i>Neoclytus a. americana</i>
* <i>Eupogonius subarmatus</i>	* <i>Oplosia nubila</i>
<i>E. vestitus</i>	* <i>Saperda vestita</i>
* <i>Grammoptera exigua</i>	<i>Urgleptes querci</i>
* <i>Hyperplatys maculata</i>	<i>U. signatus</i>
<i>Leptostylus t. transversus</i>	

Table 1. (Continued)

Host plant	
Cerambycid	Cerambycid
<i>Toxicodendron radicans</i> (L.) Kuntze	
* <i>Amniscus macula</i>	<i>Graphisurus fasciatus</i>
<i>A. sexguttata</i>	* <i>Leptostylus t. transversus</i>
<i>Elaphidionoides villosus</i>	<i>Neoclytus a. acuminatus</i>
<i>Eupogonius vestitus</i>	<i>Psenocerus supernotatus</i>
<i>Toxicodendron vernix</i> (L.) Kuntze	
<i>Amniscus macula</i>	<i>Oberea ocellata</i>
<i>Eupogonius vestitus</i>	<i>Urgleptes querci</i>
<i>Ulmus americana</i> L.	
<i>Ecyrus dasycerus</i>	<i>Urgleptes querci</i>
<i>Sternidius alpha misellus</i>	
<i>Vaccinium corymbosum</i> L.	
<i>Urgleptes querci</i>	
<i>Viburnum acerifolium</i> L.	
<i>Urgleptes querci</i>	
<i>Vitis riparia</i> Michaux	
* <i>Clytoleptus albofasciatus</i>	* <i>Neoclytus a. acuminatus</i>
<i>Molorchus b. bimaculatus</i>	* <i>Phymatodes amoenus</i>

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