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THE DIPTEROUS FAUNA OF TREE TRUNKS

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A VERY interesting but neglected ecological situation is found on and under the bark of the trunks of trees, either live or dead. The greater part of the insect fauna of such situations is composed of Diptera, many of the species of which are to be met with nowhere else. Data concerning the Diptera associated with two species of trees (poplar or cottonwood, *Populus deltoides* Marsh. of most manuals; and common or black locust, *Robinia Pseudo-Acacia* L.) have been gathered by the writer with the assistance of Curtis W. Sabrosky. The results are here presented as an addition to the small fund of knowledge available relating to the insects of such associations, and it is hoped that, in view of the fact that most of the records of insects in such habitats relate to beetles, the data will be of especial interest.

Descriptions of the localities and lists of species will be given, followed by notes on the flies and a tabular summary.

A. THE DIPTERA OF POPLAR TRUNKS (*POPULUS DELTOIDES* MARSH.)

LOCALITY G. A large tree which put forth its last few leaves in the spring of 1948 was observed on Grosse Ile, an island in the mouth of the Detroit River, Wayne County, Michigan, during the fall of 1947 and the whole season of 1948. The following species were taken from the trunk at various heights from the base up to twelve feet:

- Atomosia puella*, July 25, 1948 (2).
Berkshiria albistylum, June 22, 27, July 1, 3, 4, 5, 1948 (8).
Chymomyza amoena, June 30, 1948 (1).
Chyromya flava, June 27, 30, July 1, 1948 (3).
Delphinia picta, several specimens at most times during the season.
Dendrophaonia querceti, June 22, 27, July 1, 4, 1948 (6 females).
Desmometopa tarsalis, July 3, 4, 25, 1948 (5).
Drapetis? sp. nov., several specimens.
Eustalomyia vittipes, Sept. 19, 26, 1948 (several).
Gnophomyia tristissima, very abundant (see below).
Lonchaea corticis, very abundant; series taken June 10, 22, 27, July 16, 24, 1948.
L. ruficornis, abundant; June 13, 22, 27, July 3, 11, 16, 24, 1948 (females only).

Medeterus veles, June 22 to July 11, 1948 (several).
Milichiella populi sp. nov. (described on p. 130), June 27, July 3, 5, 25, 1948(9).
Mycetobia divergens, near base of tree, June 27, July 5, 1948 (2).
Neopachygaster maculicornis, June 22, 27, July 1, 4, 11, 25, 1948 (21).
Neurigona perplexa, June 30 (male), July 11 (female), 1948 (2).
Pachygaster pulcher, July 3, 1948 (1).
Pseudotephritis cribellum, Aug. 3, Sept. 7, 1947 (numerous females); June 10, 22, 27, July 5, 16, 1948 (very abundant, mostly females).
P. vau, July 3, 1948 (1).
Pterocalla strigula, May 29, 31, 1948 (3).
Sobarocephala populi sp. nov. (described on p. 129), June 30, 1948(1).
Solva pallipes, June 22, July 1, 5, 24, 1948 (fairly abundant).
Stegana coleoprata, June 10, 1948 (1).
Thaumatomyia glabra, July 4, 11, 1948 (3).

The black crane fly, *Gnophomyia tristissima*, was by far the most abundant, followed in order of frequency by *Pseudotephritis cribellum*, *Lonchaea corticis*, and *L. ruficornis*.

As an indication of the specificity of the habitat it is interesting to note that, although the writer has been engaged for more than ten years in compiling a list of the Diptera of Michigan, which at this writing totals more than three thousand species, the following species from the list given above were taken in Michigan for the first time: *Berkshiria albistylum*, *Drapetis?* sp. nov., *Lonchaea corticis*, *L. ruficornis*, *Milichiella populi*, *Mycetobia divergens*, *Sobarocephala populi*. Several others are known in Michigan from but very few records. The writer's experience leads him to believe that few or none of the species are strictly accidental in the situation and that they have a biological connection with it.

B. THE DIPTERA OF LOCUST TRUNKS (ROBINIA PSEUDO-ACACIA L.)

The largest number of the Diptera listed under this heading were observed on live trees feeding at the usually fermenting frass protruding from holes, most of which were bored by the cerambycid beetle *Megacyllene robiniae*. The writer is indebted to Curtis W. Sabrosky for the records from localities C, M, and T. Both Sabrosky and the writer worked at localities B and N.

LOCALITY B. Northwestern corner of Branch County, Michigan, May 31, 1942. Row of medium-sized trees along the road, with some pupal skins of the lepidopteron *Prionoxystus robiniae* (det. Carl Heinrich) protruding from the bark.

Callopietromyia annulipes, 1.
Lonchaea nudifemorata, several.
Rivellia viridulans, 2.
Traginops irrorata, 3.

LOCALITY C. Cass County, Michigan, near Niles, June 24, 1943. Roadside grove with much evidence of borer work.

Callopietromyia annulipes, very abundant, feeding at fresh borer frass.
Delphinia picta, 1.
Euxesta notata, 2.
Oscinella catalpae, 1, feeding at frass.
Rivellia viridulans, numerous.
Traginops irrorata, numerous.

LOCALITY D. Detroit, Michigan, grove of small trees with much borer work. The beetle *Megacyllene robiniae* was found on trunk and branches in the fall.

Aulacigaster leucopeza, June 28, 1942, a few, feeding at frass.
Callopietromyia annulipes, June 21, 1942, 4, feeding at frass; July 26, 1942, numerous females ovipositing on dead tree.
Chymomyza amoena, 1, feeding at frass.
Delphinia picta, June 28, 1942, a few, feeding at frass.
Drosophila algonquin, June 21, 1942, numerous; June 28, 1942, a few, feeding at frass.
D. melanica, 2 on June 21 and a few on June 28, 1942, feeding at frass.
Lonchaea polita, June 21, 1942, 3, feeding at frass.
Neurigona lateralis, June 21, 1942, 2 on bark.
Rivellia viridulans, June 21 and 28, 1942, numerous, feeding at frass.
Solva pallipes, June 21, 1942, a few feeding at frass.
Traginops irrorata, June 21 and 28, 1942, a few feeding at frass.

LOCALITY M. Manistee County, Michigan, three miles south of Bear Lake, June 15, 1943. Small trees without much frass.

Aedes vexans, 3 males and 1 female, feeding at frass.
Callopietromyia annulipes, running on bark.
Desmometopa tarsalis, feeding at frass.
Euxesta nitidiventris, feeding at frass.
Hippelates bishoppi, numerous, feeding at frass.
Neurigona sp., running on bark.
Oscinella catalpae, feeding at frass.
Rivellia viridulans, running on bark.
Sphecomyiella valida, running on bark.
Several nitidulid beetles were observed feeding at frass, and *Anisopus* sp., *Scopeuma* sp., muscid, and sarcophagid flies were also seen on the bark.

LOCALITY N. Nottawa, Michigan, grove of fairly large trees on the shore of Nottawa Lake. Considerable amount of borer work.

Callopietromyia annulipes, July 7, 1943.
Delphinia picta, May 31, 1942, feeding at frass.
Drosophila melanica, June 24, 1943, feeding at frass.
Euxesta notata, May 31, 1942, feeding at frass.
Idana marginata, May 31, June 14, 1942; June 24, July 7, 1943, feeding at frass.
Lonchaea nudifemorata, May 31, 1942, feeding at frass.

LOCALITY T. Traverse City, Michigan, June 17, 1943. Frass just starting to protrude.

Callopiromyia annulipes, fairly numerous, feeding at frass.
Chymomyza amoena.
Delphinia picta, numerous, feeding at frass.
Euxesta notata.
Lonchaea nudifemorata.
Muscina sp.
Neurigona sp.
Rivellia viridulans.
Seioptera vibrans.
 Numerous nitidulid beetles also.

C. REMARKS UPON THE DIPTERA

Suborder NEMATOCERA

Family Anisopodidae

Anisopus sp. — The members of this genus are frequently found on tree trunks. The larvae occur in various substances, particularly dung, but apparently have not been reared from tree trunks.

Mycetobia divergens Wik. — Malloch (1915: 321) describes the immature stages and their habitats in mulberry and elm trees, where they feed upon exudate from bark injury in the presence of fungus.

Family Tipulidae

Gnophomyia tristissima O. S. — Very numerous on the poplar. Adults were flying over, resting on, and mating on the bark from late May until September 19. By the middle of July hundreds of pupal skins were protruding from cracks in the bark, and flies were observed emerging as late as August 28. Alexander (1920: 935) summarizes the life history of this fly, which he found under the bark of the tulip tree (*Liriodendron Tulipifera* L.), *Populus*, and box elder (*Acer Negundo* L.). Rogers cites the habits of other species of *Gnophomyia* and records immature stages of *G. tristissima* in *Robinia Pseudo-Acacia* and hornbeam (*Carpinus caroliniana*; Rogers, 1927), compares *G. tristissima* with *G. luctuosa* (Rogers, 1928), and reports immature stages in *Salix* sp. and *Populus* sp. (Rogers, 1942: 104).

Suborder BRACHYCERA

Division ORTHORRHAPHA

Family Asilidae

Atomosia puella Wied. — The adult is common resting head downward in many situations. Bromley (1946: 2) states that the group to which *Atomosia* belongs develops in dead wood, but that the larva of *Atomosia* is not known.

Family Dolichopodidae

Medeterus veles Lw. — Frequently found on trunks of various trees. Species of the genus have been reared as predators upon bark beetles (Scolytidae).

Neurigona lateralis Say, *N. perplexa* Van Duzee, etc. — Representatives of the genus *Neurigona* are often found on trunks of various trees. Nothing seems to be known of their immature stages.

Family Empididae

Drapetis? sp. nov. — Minute predaceous flies, the biology of one species of which is treated by Malloch (1917: 402). The larvae occur under bark and in decaying wood.

Family Erinnidae (Xylophagidae)

Solva pallipes Lw. — An abundant species that has been observed on many species of trees. Townsend (1893b: 163), Malloch (1917: 342), Greene (1926: 4), and Johannsen (1922: 145) have described the biology of the species and have cited it as developing under the bark and in wounds of *Populus* sp., *Liriodendron Tulipifera*, and *Robinia "podagrica."* Malloch found the larvae predaceous, but Greene states that they are "usually scavengers and may occasionally be predaceous."

Family Stratiomyidae

Berkshiria albistylum Johnson (*Johnsonomyia aldrichi* Malloch). — There seem to be no data on the immature stages of this species.

Neopachygaster maculicornis Hine. — Malloch (1917: 326) reared this species from larvae collected in bark of fallen elm trees, and Pechuman (1937) also found it in elm. Greene (1917: 146) described the immature stages from under bark of *Liriodendron*. Johannsen (1922) has also described the immature stages.

Pachygaster pulcher Lw. — No data seem to be available concerning the immature stages.

Division CYCLORRHAPHA

Family Agromyzidae

Traginops irrorata Coq. — Johnson (1925: 289) found the adult at fermenting sap of red oak, in which situation the present writer has also taken it. The immature stages seem to be unknown.

Family Aulacigasteridae

Aulacigaster leucopeza Mg. — Malloch and McAtee (1924: 39) have described the immature stages from sap in wounds on trunks of unidentified trees. Séguy (1934a: 396) describes the immatures from "pourriture liquide des ulcères des ormes." The writer has also taken adults at wounds on elm, and also at sapsucker holes on sugar maple. The genus is usually classified with the Drosophilidae.

Family Chloropidae

Hippelates bishoppi Sabrosky. — A number of species of *Hippelates* are of economic importance, but little seems to be known of their biology. The present species has been described quite recently.

Oscinella catalpae Malloch. — According to information kindly furnished by Curtis W. Sabrosky, material in the United States National Museum was reared as a parasite of a lepidopterous gall formed on black locust, *Ecdytolopha insiticihana* Zeller, and is known from larvae reared in seed and pods of *Catalpa* and in "gall on cherry."

Thaumatomyia (= *Chloropisca*) *glabra* Mg. — Parker (1918) has described the life history. This very common species is apparently predaceous, although Séguy (1934b: 196) says that it seems to be "polyphage."

Family Chyromyidae

Chyromya flava L. — The immature stages are apparently unknown. The adults are sometimes found at windows in houses.

Family Clusioididae

Sobarocephala populi sp. nov. (see below). — This species likely has a biology similar to that of *S. flaviseta* Jns. (*S. convergens* Malloch) as described by Malloch (1918).

Family Drosophilidae

Chymomyza amoena Lw. — Frequently found on freshly cut wood, garbage, etc., and has been reared from walnut and butternut hulls and rotten corn. The immature stages have been described by Patterson (1943: 38).

Drosophila algonquin Sturt. and Dobzh. — In the "affinis group," to which this species belongs, the immature stages of only *D. affinis* have

been described (Patterson, 1943: 74); they were from material reared on banana. Adults of *D. affinis* have been taken at sap and fungi. The writer has taken *D. algonquin* adults in April at sugar maple sap running from sapsucker holes.

D. melanica Sturt. — The writer's material is probably referable to the subspecies *paramelanica* Patterson, which, together with its immature stages, was described in 1943 (Patterson, p. 166). *D. melanica* has been reared from butternut hulls and the adults have been taken at *Liriodendron* sap.

Stegana coleoptrata Scop. — Séguy (1934b: 184) states that the larva lives in wood, notably that of poplar.

Family Lonchaeidae

Lonchaea corticis Taylor. — This form was described (Taylor, 1928a: 191) from material reared from white pine (*Pinus strobus*) shoots infested with the weevil *Pissodes strobi*. The same author published notes on the association elsewhere in the same year (1928b: 217). The writer's material agrees very well with Taylor's description, but he feels that both it and Taylor's should be compared with the European species *L. palposa* Zett., which has been found in the larval stage under the bark of willow. Our material was abundant on poplar and could be seen at any time probing crevices in the bark with their ovipositors. All specimens taken from the bark were females. Three males were taken on the evening of June 27, 1948, while they were flying around the tree at a height of seven or eight feet.

L. nudifemorata Malloch. — The only place that we have taken this species is at borer frass on *Robinia*. No other habitat records are available.

L. polita Say. — A common species which has been reared from many kinds of material, including old pumpkin vines, cabbage stalks, butternut hulls, and elm logs, and also under bark of *Juglans regia*, *Pinus strobus*, and *Robinia Pseudo-Acacia*. It is likely that some of these rearings are actually of other species.

L. ruficornis Malloch. — Observed ovipositing in crevices in poplar. Females only were found. No other biological data are available.

Family Milichiidae

Desmometopa tarsalis Lw. — No biological data on this species are available, but the related *D. latipes* Mg. has been reared from coniferous

branches infested with the weevil *Pissodes strobi* (Taylor, 1928a: 224); it has been taken as adult in a bird's nest and has been seen darting under a feeding spider. *D. m-nigrum* Zett. has been reared from cow manure. Adults of several species of this and other genera of the family are frequently taken in sunlight on dry dead wood, such as fence posts, rail fences, and telephone poles.

Milichiella populi sp. nov. (described in the next section). — Séguy (1934a: 638) cites larvae of the related European *M. argyrogastra* Perris found "sous l'écorce vermoulue d'une branche de tilleul."

Family Otitidae (Ortalidae)

Callopiromyia annulipes Macq. — Frost (1928: 169, and 1929: 84) found the species abundantly attracted to molasses and syrup bait traps in a peach orchard. It has apparently never been reared.

Delphinia picta R.-D. — Frost (as cited) found only one specimen in each of two years' collecting in Pennsylvania, but in Michigan the species is abundant and may be taken nearly anywhere during the summer. Nothing seems to be known of its immature stages.

Euxesta nitidiventris Lw. — The larva has been reared from under the bark of dead pecan (*Carya pecan*; Brues, 1902; quoted by Hendel, 1910). It has also been reared from yam and sweet corn in subtropical America (Chittenden, 1911).

E. notata Wied. — Hendel (1910) summarized our knowledge of this species up to that date. It has been reared since from decaying onions and from sweet peppers, and Hutchison (1916) has described the larva. It is apparently a saprophyte in a wide variety of media, including human feces.

Idana marginata Say. — Not a common fly; no biological data available.

Pseudotephritis spp. — No biological data are available on *P. cribellum*. *P. vau* was stated by Johnson (1899) to be common in the larval stage under "bark," and Weiss and West (1920) have reared it from the fungi *Lenzites betulina* and *Polyporus hirsutus*. *Pseudotephritis corticalis* was described in all stages by Greene (1917) from material found in frass under bark of chestnut (*Castanea dentata*).

Pterocalle strigula Lw. — Not a common fly. Nothing is known of its biology, except that Alexander (1920: 936) found the larva under bark of *Acer Negundo*.

Rivellia viridulans R.-D. — The writer considers this a common species, especially around leguminous plants, but nothing seems to be known of its immature stages or life history.

Seioptera vibrans L. — A species very common here and in Europe. Hendel (1910) summarized the biology as known to that date. It has been reared several times from earth or from earth mixed with horse manure, and was found once injuring the stems of *Dianthus carthusianorum*, but no description of its immature stages seems available.

Family Pyrgotidae

Sphecomyiella valida Lw. — Flies of this family are known to be parasitic upon beetles. The related *Pyrgota undata* parasitizes species of *Phyllophaga*, but nothing seems to be known about the biology of the present species.

Family Muscidae (including Anthomyiidae)

Dendrophaonia querceti Bouché. — Séguy's great work on the Muscidae (1938) gives a complete bibliography of this species, concerning which little has been published in North America.

Eustalomyia vittipes Zett. — The foregoing paragraph applies to this species also.

Muscina sp. — Flies of this species are very common and apparently are general scavengers and even parasites.

Scopeuma sp. (= *Scatophaga* sp.). — This genus includes predaceous flies, which typically develop in manure.

D. DESCRIPTIONS OF TWO NEW SPECIES OF DIPTERA

Sobarocephala populi sp. nov. Clusioidarum.

Male. Length, 3.17 mm.

Yellow, except blackish ocellar spot and elongate but diffuse brown spot at end of second wing vein. Bristles black, those of the abdomen a little brownish. Hairs of head, thoracic dorsum, and abdomen blackish, those of pleura, sternum, and legs yellow.

Head with front 0.4 total width of head, a little narrowed anteriorly. Third antennal joint circular in profile, arista loosely short-plumose. Ocellar and postocellar bristles fine, each about as long as half the frontal width.

Thorax with small but distinct prescutellars and about six rows of

hairs between the anterior dorsocentral bristles. Scutellum with a long pair of cruciate apicals and two small laterals on each side. Wings hyaline except the spot at end of second vein, the veins otherwise yellow. Last two sections of fourth vein as 1 : 4.3. Squamae with blackish border and ciliae.

Fore femora with complete row of posteroventral bristles; middle femora with a complete posteroventral row of 16–20 bristles, each about half as long as femoral diameter, and in the distal half a row of about eight somewhat smaller anteroventral bristles; posterior femora with a few anteroventral setose hairs distally. Middle tibiae with ventral hairs in distal half noticeably erect. Fore tarsi slender, nearly 1.5 times as long as their tibiae. Middle and hind tarsi approximately 1.2 times as long as their tibiae.

Abdomen with marginal setae of second to fifth tergites about as long as the tergites. Hypopygium about as long as depth of abdomen, the lamellae in profile about two thirds as long as the hypopygium, oval, about 1.5 times longer than wide.

HOLOTYPE, male, Grosse Ile, Michigan, on bark of trunk of dead *Populus deltoides*, June 30, 1948; in University of Michigan Museum of Zoology.

The species runs in the key of Melander and Argo (1924: 34) to *Sobarocephala flava* M. and A., described from females only, but the setose femora, yellow anterior tarsi, and exceptionally long ultimate section of fourth vein make its identification with that species inadvisable. It may be remarked that, although the description of *S. flava* states that the last two sections of the fourth vein are as 1 : 3, the photograph shows a proportion of at least 1 : 3.6.

Milichiella populi sp. nov. Milichiidarum.

Male. Length, 2.5 mm.

General color black, middle and hind basitarsi brownish, especially toward base. Palpi and antennae entirely black. Haltere knob yellow to brown, stem blackish. Squamae and their ciliae whitish. Wings white, the veins scarcely yellowish.

Head with front dull leaden-bluish pruinose, with two to three pairs of short interfrontal setae. Ocellar triangle small, equilateral. Cheeks linear.

Thoracic dorsum pale gray pruinose, sometimes with a pair of incipi-

ent broadish acrostichal brown stripes anteriorly. Hairs of thorax bristly. One distinct dorsocentral bristle, but the bristle anterior to it is more than half its length. Four to six rows of acrostichal setae and a distinct pair of prescutellars. Scutellum paraboloid in outline, proportion of length to width between basal bristles as 9 : 15. Pleura dull blackish with some subshining areas; mesopleura bare; sternopleura with one long bristle and one to several bristly hairs. Wings with anterior crossvein approximately its length apicad of the costal break; the ultimate section of fourth vein 3.3 times as long as the penultimate; third and fourth veins only slightly convergent apically.

Abdomen bright silvery pruinose, except first tergite, anterior corners of second tergite, posterior edge and corners of fifth tergite, and venter. Second tergite with basal triangular emargination one fourth the length of the tergite, which is twice as long as the third; it in turn is equal in length to the fourth. Second, third, and fourth tergites dorsally bare, except a subapical row of nine to thirteen short setulae. Lateral setae, even basally and apically, not strikingly long.

HOLOTYPE, male, Grosse Ile, Michigan, on bark of trunk of dead *Populus deltoides*, July 5, 1948; in University of Michigan Museum of Zoology; paratypes, same locality, June 27, July 3, 25, 1948, in University of Michigan Museum of Zoology, United States National Museum, and the author's collection.

This form has several of the characters of *Eccoptomma* Becker, a group which Becker himself said "darf als Unter Gattung angesehen werden." *Milichiella cinerea* Coquillett is apparently the nearest relative of *M. populi*. According to information kindly furnished by Curtis W. Sabrosky, the type of *M. cinerea* now consists of only a piece of thorax and a leg buried in glue; a Santo Domingo specimen (recorded by Malloch, 1913: 132) differs from *M. populi* as follows: palpi yellow; third antennal segment conspicuously yellow at base below; rather narrow brown stripes on notum (not too clear, not in best of condition); front bright gray pollinose, brighter than the thorax; scutellar length to width between basal bristles as 12 to 18.

E. SUMMARY

The occurrences of Diptera, both on poplar (Locality G) and on black locust (the remaining localities), are summarized in Table I, in which the species are arranged taxonomically.

TABLE I

LIST OF DIPTERA, WITH TABULATION OF OCCURRENCES

SPECIES	Locality						
	G	B	C	D	M	N	T
Anisopodidae:							
Anisopus sp.	+
Mycetobia divergens Wlk.	+
Culicidae:							
Aedes vexans Mg.	+
Tipulidae:							
Gnophomyia tristissima O. S.	+
Asilidae:							
Atomosia puella Wied.	+
Dolichopodidae:							
Medeterus veles Lw.	+
Neurigona lateralis Say.	+
N. perplexa Van Duzee.	+
N. sp.	+	..	+
Empididae:							
Drapetis? sp. nov.	+
Erinnidae:							
Solva pallipes Lw.	+	+
Stratiomyidae:							
Berkshiria albistylum Jns.	+
Neopachygaster maculicornis Hine	+
Pachygaster pulcher Lw.	+
Agromyzidae:							
Traginops irrorata Coq.	+	+	+
Aulacigasteridae:							
Aulacigaster leucopeza Mg.	+
Chloropidae:							
Hippelates bishoppi Sabr.	+
Oscinella catalpae Mall.	+	..	+
Thaumatomyia glabra Mg.	+
Chyromyidae:							
Chyromya flava L.	+
Clusioididae:							
Sobarocephala populi sp. nov.	+
Drosophilidae:							
Chymomyza amoena Lw.	+	+	+
Drosophila algonquin Sturt. and
Dobzh.	+
D. melanica Sturt.	+	..	+	..
Stegana coleoprata Scop.	+
Lonchaeidae:							
Lonchaea corticis Taylor	+
L. nudifemorata Mall.	+	+	+
L. polita Say	+
L. ruficornis Mall.	+
Milichiidae:							
Desmometopa tarsalis Lw.	+	+
Milichiella populi sp. nov.	+

TABLE I (Concluded)

SPECIES	Locality						
	G	B	C	D	M	N	T
Otitidae:							
Callopiostromyia annulipes Macq. .	..	+	+	+	+	+	+
Delphinia picta R.-D.	+	..	+	+	..	+	+
Euxesta nitidiventris Lw.	+
E. notata Wied.	+	+	+
Idana marginata Say.	+	..
Pseudotephritis cribellum Lw.	+
P. vau Say.	+
Pterocalla strigula Lw.	+
Rivellia viridulans R.-D.	+	+	+	+	..	+
Seioptera vibrans L.	+
Pyrgotidae:							
Sphecomyiella valida Lw.	+
Muscidae:							
Dendrophaonia querceti Bouché ..	+
Eustalomyia vittipes Zett.	+
Muscina sp.	+
Scopeuma sp.	+

GROSSE ILE, MICHIGAN

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