The Canadian Entomologist

Vol. LXXXI January 1949 No. 1

Insects Collected in the Dundas Marsh, Hamilton, Ontario, 1946-47, with Observations on Their Periods of Emergence[1]

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Introduction

During the summer of 1947 a project was initiated with the object of determining the earliest and latest dates of appearance and the period of appearance of maximum numbers of the various species of insects which emerge as adults from the Dundas Marsh, Hamilton, Ontario. Previous to this, during the summer of 1946, observations were made on the occurrence of various insects on the marsh. Such observations were continued during 1947 and are reported herewith.

Description of Region

The Dundas Marsh, lying along the northern limits of the city of Hamilton, is a region of about 700 acres in extent (see map, fig. 1). During the past it has received a variety of names. Father Hennepin, missionary and explorer, visited the region early in the seventeenth century and named it "Little Flanders" (Burkholder, 1938). It was later named "Coote's Paradise" after a Captain Coote, of the garrison at York, who hunted waterfowl in the marsh. The name "Jubilee Sanctuary" was applied to the marsh to commemorate the jubilee year of King George V in 1935.

The marsh lies in a valley below the Niagara Escarpment where the latter runs north-eastward from the town of Dundas, and its waters are fed by several streams which flow over the escarpment. In its original condition the marsh emptied into Hamilton Bay by an outlet at its north-eastern end. In 1827 the construction of the Desjardins Canal (see map, fig. 1) was begun and it was opened for traffic in 1837. The canal extends eastward from a turning basin in the town of Dundas for a distance of about three miles and has access to Hamilton Bay

[1]Contribution from the Department of Zoology, McMaster University; a project supported by funds from the government of Ontario on the recommendation of the Advisory Committee on Fisheries and Wildlife of the Ontario Research Commission.

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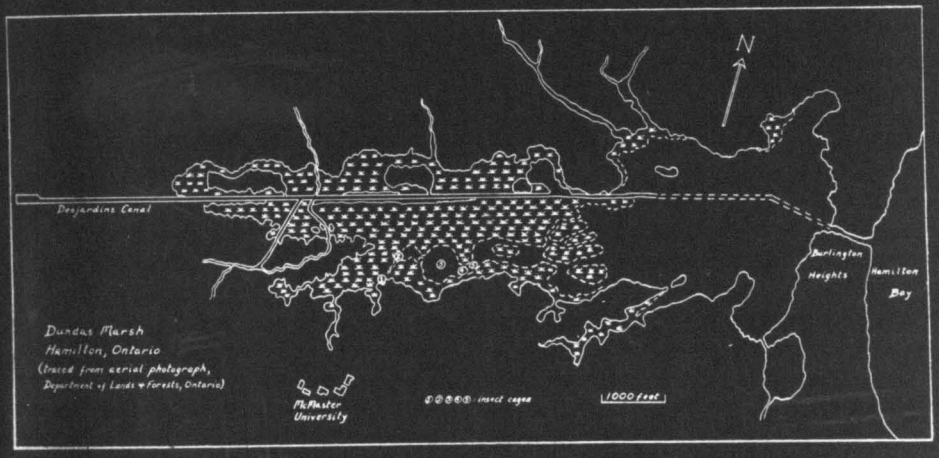

FIGURE 1.

by a cut through Burlington Heights which separates the marsh from the bay. With the increase in importance of Hamilton as a port in the latter part of the nineteenth century the Desjardins Canal fell into disuse and today is navigable only by canoe or by small boats.

At the eastern end of the marsh is open water comprising about one-quarter of the total area of the marsh. The remainder of the area supports a heavy growth of aquatic and marsh-dwelling plants. The predominant plant in the central part of the marsh is the Old World Manna Grass, *Glyceria maxima* (Hartm.) Holmb. (Dore, 1947). *Typha latifolia* L. also forms predominant stands throughout the marsh. Various submerged plants grow in quiet stretches of water extending westward from the open water.

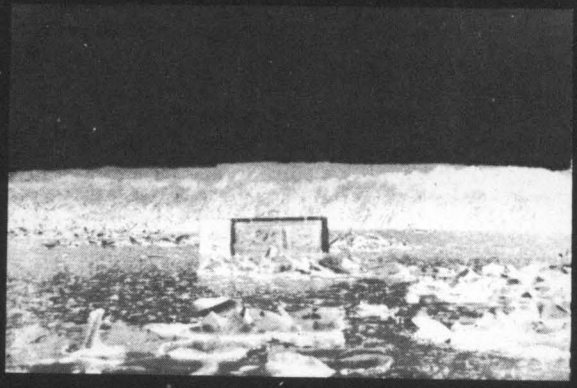

FIGURE 2. Cage 5 from southeast on July 24, 1947 (water level—54″)

Methods

Collections of insects were made by patrolling the shores of the marsh and sweeping the vegetation with a net. Collections over deep water were made from a canoe. Insects in flight were netted when possible and the emergent leaves of aquatic plants were examined for the presence of insects.

To carry out the study of the times of appearance of the various species of insects emerging from the water during 1947, five cages were used (fig. 2). These cages were placed at selected points on the marsh (see map, fig. 1) in water of various depths and in regions supporting various growths of vegetation. The wooden frame of each cage was 36″ long, 30″ wide and 36″ tall. The top and four sides were covered with No. 16 copper screening. The bottom of the cage was open. Along the upper part of each of the 36″ sides was a door of dimensions 32″ x 15″, hinged at the bottom, to allow the collector access to the cage. Each door was held shut by hooks at the top. Each cage was set securely over four 2″ x 2″ posts driven firmly into the bottom of the marsh so that the lower border of the cage was about one foot below the surface of the water.

The cages were visited by canoe between 9.30 a.m. and 11.30 a.m. (in a few cases between 2.00 p.m. and 4.00 p.m.) daily, or as frequently as possible during the week. Records were made of the depth of the water and of the temperature at the surface and at the bottom at each cage. The depth of the water was read from a scale (inches) attached to the side of the cage. The temperature of the water at the surface was taken with a Centigrade thermometer. The temperature of the water at the bottom was taken with a Negretti and Zambra reversing thermometer (0 deg.—25 deg. C).

After the depth and temperatures of the water at a cage had been recorded the insects were collected from the cage. The canoe was drawn up alongside the cage, and one of the doors was opened. Large insects (dragon flies, damsel flies, etc.) were captured by hand and were put in a cyanide jar. Small insects (midges, etc.) were sucked into a jar by means of an aspirator and then transferred to a cyanide jar. Dead insects lying on the surface of the water were scooped up with a small strainer and were placed in preservative. Collections from the different cages were kept separate. The collecting of insects was continued till Nov. 3 when the cages were removed and stored for the winter.

On return to the laboratory representative specimens were pinned and labelled (date, name of collector, number of cage) and the remaining specimens were placed in preservative in shell vials, specimens from each of the five cages being kept separate. All specimens, pinned and preserved, are retained in collections at McMaster University except series kept by specialists who have examined the insects. The number of specimens of each species in a daily catch, from each cage, was determined and recorded. The number of specimens of each species trapped in all cages daily was also determined and recorded.

Data on Cages

Cage I: set out on April 17, 1947 twenty feet from shore in a growth of *Typha latifolia.*

Depth of water: April 17—20 inches; maximum—36 inches, June 27.

Temperature: bottom—minimum— 6.0 deg. C—April 28
—maximum—23.0 deg. C—June 30
surface—minimum— 6.0 deg. C—April 28
—maximum—26.0 deg. C—June 23

Plants in cage: *Typha latifolia* L. (predominant), *Myriophyllum verticillatum* L. (predominant), *Spirodela polyrhiza* (L.) Scheld., *Lemna minor* L., *Wolffia columbiana* Karst., *Ceratophyllum demersum* L., *Anacharis canadensis* (Michx.) Planchon, *Ricciocarpus natans* (L.) Corda.

Cage II: set out on May 3, 1947 over a growth of submerged plants.

Depth of water: May 3—24 inches; maximum—42 inches, July 8.

Temperature: bottom—minimum— 5.7 deg. C—May 8
—maximum—22.7 deg. C—July 2
surface—minimum— 7.0 deg. C—May 8
—maximum—29.2 deg. C—Aug. 14

Plants in cage: *Utricularia vulgaris* var. *americana* Gray (predominant), *Myriophyllum verticillatum* L., *Spirodela polyrhiza* (L.) Scheld., *Lemna minor* L., *Wolffia columbiana* Karst., *Ricciocarpus natans* (L.) Corda.

Cage III: set out on May 3, 1947 over a growth of submerged plants.

Depth of water: May 3—36 inches; maximum—54 inches, June 13.

Temperature: bottom—minimum— 8.7 deg. C—Nov. 1
—maximum—22.8 deg. C—July 18
surface—minimum— 8.6 deg. C—Nov. 1
—maximum—27.5 deg. C—July 14

Plants in cage: *Ceratophyllum demersum* L. (predominant), *Spirodela polyrhiza* (L.) Scheld., *Lemna minor* L., *Wolffia columbiana* Karst.

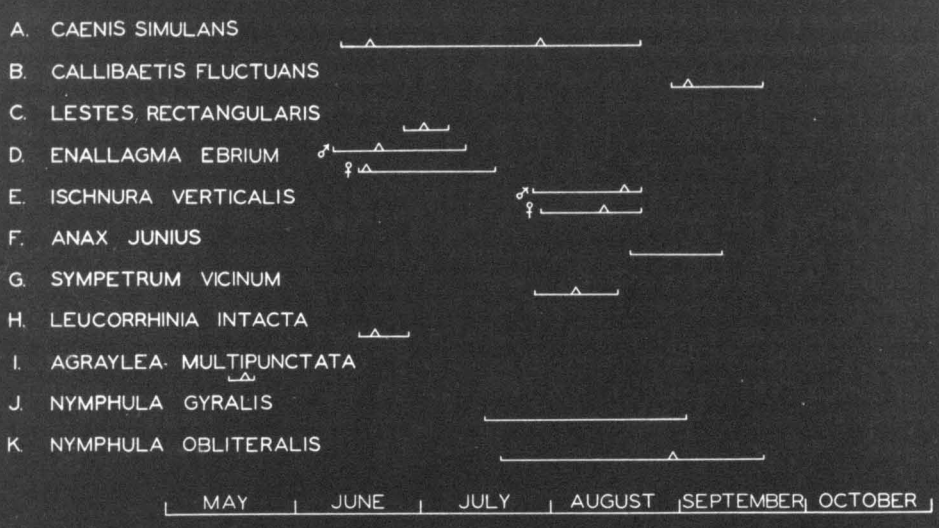

FIGURE 3. TIME OF EMERGENCE OF ADULTS △ TIME OF MAXIMUM EMERGENCE

Cage IV: set out on June 12, 1947 over a growth of water lily and submerged plants.

Depth of water: June 12—60 inches; maximum—60 inches, June 12.

Temperature: bottom—minimum— 9.0 deg. C—Nov. 1
—maximum—23.0 deg. C—July 18
surface—minimum— 8.0 deg. C—Nov. 1
—maximum—28.8 deg. C—July 14

Plants in cage: *Nymphaea odorata* Ait. (predominant), *Potamogeton pectinatus* L., *Ceratophyllum demersum* L., *Spirodela polyrhiza* (L.) Scheld., *Lemna minor* L., *Wolffia columbiana* Karst.

Cage V: set out on June 12, 1947 over a growth of submerged plants.

Depth of water: June 12—57 inches; maximum—58 inches, June 18.

Temperature: bottom—minimum— 8.7 deg. C—Nov. 1
—maximum—23.8 deg. C—Aug. 15
surface—minimum— 8.9 deg. C—Nov. 1
—maximum—29.0 deg. C—July 14

Plants in cage: *Ceratophyllum demersum* L. (predominant), *Potamogeton pectinatus* L., *Spirodela polyrhiza* (L.) Scheld., *Lemna minor* L., *Wolffia columbiana* Karst., *Ricciocarpus natans* (L.) Corda.

Insects Collected

Collembola

Arthropleona

Poduridae

Podura aquatica L.

Springing actively on the surface of the water and on collapsed vegetation about the borders of the marsh, April 21, 1947.

Entomobryidae

Isotomurus palustris (Muller)

On surface of water in company with *Podura aquatica*, April 21, 1947.

Symphypleona

Sminthuridae

Bourletiella spinata (MacG.)

Springing actively on the surface of the water and clustered on the lower parts of leaves of *Typha latifolia*, June 5, 1947.

PLECOPTERA

Capniidae

Allocapnia pygmaea (Burmeister)

Two specimens, one brachypterous, were collected by Mr. K. Broman, Royal Botanical Gardens, from a "large mass", February 25, 1947. The insects were reported to be milling about on the surface of the ice and flying about above it. Several couples were mating in flight and on the ice.

EPHEMERIDA

Baetidae

Caenis simulans McDunnough

Trapped in cages (437): earliest emergence—June 12, latest emergence—Aug. 23, maximum emergence—June 19 (45) and July 30 (35). (fig. 3A).

Callibaetis fluctuans Walsh

Trapped in cages (33): earliest emergence—Aug. 30, latest emergence—Sept. 21, maximum emergence (5)—Sept. 3, 1947. (fig. 3B).

Baetis pygmaeus Hagen

Single specimen trapped in cage 3, Oct. 18, 1947.

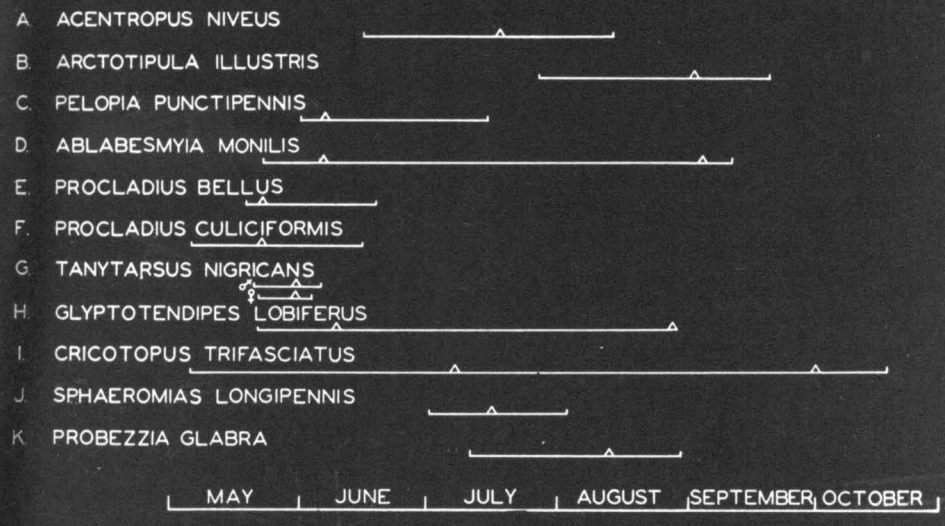

FIGURE 4. TIME OF EMERGENCE OF ADULTS △: TIME OF MAXIMUM EMERGENCE

Odonata

Zygoptera

Lestidae

Lestes rectangularis Say

Trapped in cages (9): earliest emergence—June 27, latest emergence—July 8, maximum emergence (3)—July 2, 1947. (fig. 3C).

Coenagriidae

Enallagma ebrium (Hagen)

Trapped in cages: males (69): earliest emergence—June 9, latest emergence —July 11, maximum emergence (8)—June 20, 1947; females (49): earliest emergence—June 16, latest emergence—July 19, maximum emergence (9)—June 18, 1947. (fig. 3D).

All adults trapped in cages were of the light teneral colouration. Bright blue males were seen or captured only in flight. The males emerged first about a week ahead of the females (Miller, 1941).

Ischnura verticalis (Say)

Trapped in cages: males (11): earliest emergence—July 28, latest emergence —Aug. 23, maximum emergence (2)—Aug. 19, 1947, (a single male was captured, June 25); females (8): earliest emergence—July 30, latest emergence—Aug. 23, maximum emergence (2)—Aug. 14, 1947. (fig. 3E).

All females trapped in cages were of the orange heterochromatic colouration. Bluish, pruinose females were seen only in flight.

Anisoptera

Aeschnidae

Anax junius (Drury)

Trapped in cages (5): earliest emergence—Aug. 20, latest emergence—Sept. 11, 1947. (fig. 3F).

All specimens trapped were of the teneral colouration, with greenish thorax and purple abdomen. A single specimen, seen in flight on April 3, 1947, was probably a migrant returning from the south (Walker, 1941). On warm days during October 1947 flights of forty to fifty adults were seen milling about in the air over the McMaster campus which borders the marsh.

Libellulidae

Perithemis tenera (Say)

A single specimen was captured by Mr. E. Turner on a flowering head of goldenrod at the edge of the marsh, Aug. 14, 1946.

Libellula quadrimaculata L.

Single specimen captured in flight, June 26, 1946.

Libellula luctuosa Burm.

Single specimen captured in flight, July 5, 1946.

Libellula pulchella Drury

Two trapped in cages: July 2 (cage 1) and July 16 (cage 4), 1947. Three captured in flight: June 27, July 5, July 26, 1946.

Sympetrum vicinum (Hagen)

Trapped in cages (11): earliest emergence—July 28, latest emergence—Aug. 18, maximum emergence (5)—Aug. 6, 1947. (fig. 3G).

All specimens trapped were of the yellowish brown teneral colouration.

Leucorrhinia intacta Hagen

Trapped in cages (18): earliest emergence—June 16, latest emergence—June 28, maximum emergence (3)—June 20, 1947. (fig. 3H).

All specimens trapped were of the light teneral colouration.

Pachydiplax longipennis (Burm.)

Two trapped in cages: Aug. 23 (cage 1), Aug. 25 (cage 4), 1947.

Tramea lacerata Hagen

Three trapped in cages: Aug. 30 (cage 4), Sept. 6 (cages 2, 3), 1947. One caught in flight July 6, 1946.

TRICHOPTERA

Hydroptilidae

Agraylea multipunctata Curtis

Trapped in cages (9): earliest emergence—May 16, latest emergence—May 22, maximum emergence (2)—May 20, 1947. (fig. 3I).

Leptoceridae

Leptocerus americanus (Banks)

Single specimen trapped in cage 4, June 27, 1947.

LEPIDOPTERA

Pyralidae

Nymphula icciusalis Walker

Single specimen trapped in cage 1, June 27, 1947. Specimen caught in flight Aug. 14, 1947.

Nymphula gyralis Hlst.

Trapped in cages (4): earliest emergence—July 16, latest emergence—Sept. 3. Several caught in flight—Aug. 14, 15, 1947. (fig. 3J).

Nymphula obliteralis Walker

Trapped in cages (11): earliest emergence—July 19, latest emergence—Sept. 21, maximum emergence (2)—Aug. 30, 1947. (fig. 3K).

Acentropus niveus Olivier

Trapped in cages (201): earliest emergence—June 16, latest emergence—Aug. 15, maximum emergence (28)—July 19, 1947. (fig. 4A). Three specimens were captured in flight June 14, 1947 (Judd, 1947).

Acentropus niveus is a moth of common occurrence in marshy regions in Europe. Munroe (1947) discusses its status in North America and expresses the opinion that it is likely a native of America. In the collection from the Dundas Marsh 204 moths were captured between June 14 and Aug. 15, 1947 with a maximum number (28) emerging on July 19. It is thus evident that the species is well established in the Dundas Marsh. There is a possibility that this insect has been introduced from Europe in view of the fact that the Desjardins Canal carried considerable shipping in the past, but this is by no means certain.

HOMOPTERA

Aphidae

Rhopalosiphum nymphaeae L.

Occurred in myriads on the leaves of *Nymphaea odorata*. Alate and apterous specimens were collected on July 18 and 22 and apterous specimens on Oct. 18, 1947.

COLEOPTERA

Chrysomelidae

Galerucella nympheae (L.)

Collected in large numbers from leaves of *Polygonum natans* Eaton, July 16, 1947.

Disonycha uniguttata Say

Collected in large numbers from leaves of *Polygonum natans* Eaton, July 16, 1947.

Donacia (*Plateumaris*) *sulcicollis* Lac.

Captured in flight, June 6, and on leaves of *Nymphaea odorata*, Aug. 4, 1947.

Donacia (*Donacia*) *subtilis* Kunze

Captured in flight, June 6, and on leaves of *Nymphaea odorata*, Aug. 4, 1947.

Coccinellidae

Coleomegilla maculata (DeGeer)

Hippodamia 13-punctata (L.)

Captured on leaves of *Nymphaea odorata* July 14 and 24, 1947. Larvae and pupae were abundant on the lily pads during August, 1947. Adults and larvae were predators of the aphid *Rhopalosiphum nympheae* L.

DIPTERA

Tipulidae

Arctotipula illustris Doane

Trapped in cages (26): earliest emergence—July 28, latest emergence—Sept. 21, maximum emergence (3)—Sept. 3 (fig. 4B).

Ormosia innocens Osten Sacken

Single specimen captured by sweeping at edge of marsh, May 13, 1947.

Tendipedidae (Chironomidae)

(subfamilies as in Townes, 1945)

Pelopiinae

Pelopia punctipennis Meigen

Trapped in cages (138): earliest emergence—June 1, latest emergence—July 16, maximum emergence (22)—June 7, 1947. (fig. 4C).

Ablabesmyia monilis L.

Trapped in cages (294): earliest emergence—May 23, latest emergence—Sept. 11, maximum emergence (10, 10)—June 6, 7 and (11)—Sept. 4, 1947. (fig. 4D).

Procladius bellus Loew

Trapped in cages (9): earliest emergence—May 19, latest emergence—June 19, maximum emergence (5)—May 23, 1947. (fig. 4E).

Procladius culiciformis L.

Trapped in cages (7): earliest emergence—May 6, latest emergence—June 16, maximum emergence (2)—May 23, 1947. (fig. 4F).

Tendipedinae

Tanytarsus nigricans (Johannsen)

Trapped in cages: males (7): earliest emergence—May 21, latest emergence —June 6, maximum emergence (2)—May 31, 1947 (fig. 4G); females (7): earliest emergence—May 22, latest emergence—June 4, maximum emergence (2)—May 31, 1947 (fig. 4G).

Tendipes tentans (Fabr.)

Three captured in flight, June 11, 1947.

Glyptotendipes atrimanus (Coq.)

One specimen trapped in cage 3, June 9, 1947. Three captured in flight, Aug. 10, Aug. 12, Oct. 2, 1947.

Glyptotendipes paripes (Edwards)

Two trapped in cage 3, May 6, May 19, 1947. One specimen captured in flight, June 4, 1947.

Glyptotendipes lobiferus (Say)

Trapped in cages (14): earliest emergence—May 22, latest emergence—Aug. 28, maximum emergence (2)—June 9, and Aug. 28, 1947. (fig. 4H).

Harnischia potamogeti Townes

Trapped in cages: May 16—June 28, 1947.

Harnischia tenuicaudata (Malloch)

Two specimens trapped in cages: May 22 and July 11, 1947.

Harnischia viridulus (L.)

One specimen trapped in cage 1, May 27, 1947 (deposited in collection of Dr. H. Townes).

Orthocladiinae

Cricotopus trifasciatus Panzer

Trapped in cages (77): earliest emergence—May 6, latest emergence—Oct. 18, maximum emergence (6)—July 3, and (6)—Oct. 1, 1947. (fig. 4I).

Spaniotoma lucida Staeg.

Trapped in cages and in flight: Apr. 24, May 16, 27, July 10, 1947.

Ceratopogonidae

(genera as in Johannsen, 1943)

Sphaeromias longipennis L.

Trapped in cages (34): earliest emergence—July 2, latest emergence—Aug. 4, maximum emergence (6, 6): July 15, 17, 1947. (fig. 4J).

Probezzia glabra Coq.

Trapped in cages (53): earliest emergence—July 12, latest emergence—Aug. 30, maximum emergence (14)—Aug. 13, 1947. (fig. 4K).

Acknowledgments

The writer is grateful to Professor A. E. Warren, in charge of the Marsh Research Project of McMaster University, for advice and encouragement during the course of this work. I wish also to express my thanks to the staff of the Marsh Research Project who have co-operated in the work, and especially to Miss Mary Inksetter who aided daily during the summer of 1947 in collecting

insects and in recording data. I am deeply obliged to the following specialists in the taxonomy of various groups for their kindness in making and checking the identifications of insects: Dr. H. B. Mills, Chief, Illinois Natural History Survey, Urbana, Illinois (Collembola); Dr. W. E. Ricker, Indiana University (Plecoptera); Dr. F. P. Ide, University of Toronto and Dr. H. T. Spieth, City College of New York (Ephemerida); Professor E. M. Walker, University of Toronto (Odonata); Dr. H. H. Ross, Illinois Natural History Survey, Urbana, Illinois (Trichoptera); Dr. W. T. M. Forbes, Cornell University (Lepidoptera); Dr. A. A. Granovsky, University of Minnesota (Aphidae); Dr. E. A. Chapin and Dr. H. S. Barber, U.S. National Museum (Coleoptera); Dr. C. P. Alexander, University of Massachusetts (Tipulidae); Dr. H. K. Townes, U.S. Department of Agriculture and Dr. J. G. Rempel, University of Saskatchewan (Tendipedidae and Ceratopogonidae).

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The Correction of a Genotypic Citation for the Genus *Choristoneura* Led.

It has been brought to my attention by G. E. Bucher, that in my note on the generic assignment of the spruce budworm *Choristoneura fumiferana* Clem. (Can. Ent. LXXIX: 21, 1947) I cited the genotype as *Tortrix rusticana* Treit. This citation is a *laps. cal.* for *Tortrix diversana* Hbn., the correct genotype as contained in my original manuscript.

T. N. Freeman.