

Tachinidae of the Canadian Maritimes with a survey in New Brunswick



Figure 1. View eastward into Passamaquoddy Bay from a lookout on the Rossmount Historical Nature Trail leading to the summit of Chamcook Mountain north of St. Andrews, New Brunswick.

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Introduction

The small rural community of Oak Bay, New Brunswick, is situated between the popular tourist towns of St. Stephen and St. Andrews in the southeastern corner of the province. Extensive secondary forest stretches into the distance on either side of the rural road, Route 170, that passes along the edge of the community and provides residents with a quieter link between the two larger towns than the NB Route 1 highway a kilometre or so to the north. Along this rural road are widely-spaced private properties that form small indentations in the surrounding forest.

I spent a week at one of these rural properties along Route 170 during the summer of 2021. I had gone out there on a holiday to visit with two long-time friends. Travel restrictions imposed during COVID-19 were beginning to lift and I was contemplating a future return to New Brunswick on a tachinid collecting trip. I had completed a three-year tachinid survey in Ottawa the year before (as yet unpublished) and wanted to compare the results with a collection of tachinids from somewhere else in Canada.

At first I had in mind a road-trip style drive through the province with stops at various places, including Oak Bay. But as I looked out upon the hectare-sized property where I was staying, I could envision my 6-metre Malaise trap up against the forest at the back, and smaller Malaise traps in other places. Several hilltops were not far away. I could pin flies from traps daily and take trips to the hilltops to supplement the trap material. With these thoughts developing into a plan, I asked my hosts about it. Would they mind if I returned for two weeks in 2022 to collect tachinids, with the understanding that I would put Malaise traps all over their property, sort trap samples at their kitchen table, pin specimens until late in the evening in their living room, and store fresh trap samples in their refrigerator/freezer to kill hangers-on and relax specimens before pinning? I knew the answer would be yes before I asked, as they were well-acquainted with my job and peculiar habit of collecting flies. They looked forward to seeing their property transformed into a research site for a couple of weeks the next summer.

From my perspective there was much to gain from a brief tachinid survey in New Brunswick. For starters, we do not have a great collection of New Brunswick tachinids in the CNC. Some of our holdings from the province originated from an insect survey in Kouchibouguac National Park on the northeastern coast in 1977 and 1978 and from Forestry surveys that periodically reared tachinids and other parasitoids from various pest insects. Of particular interest were tachinids and other Diptera collected by CNC staff member Guy Shewell during the summers of 1957 and 1965 in the area of Chamcook between Oak Bay and St. Andrews, the same area where I would be collecting. I was also interested in DNA barcoding fresh material from New Brunswick for a couple of purposes: to see if there are geographical differences in the barcodes of what appear to be the same morphospecies (between Ottawa and New Brunswick, for example), and to expand the DNA barcode “library” I am building for CNC Tachinidae.

The Maritimes

The Canadian Maritimes are comprised of the three eastern provinces of New Brunswick, Nova Scotia and Prince Edward Island. This region was covered by a vast ice sheet during the last ice age, as was most of Canada. A warming trend led to a gradual thinning and retreat of the ice and bare land began to appear around 11,000 years ago. Tundra and post-glacial boreal forest gradually replaced the once ice-covered land. Forests that developed later have been described by Zelazny (2007: 72):

“Since the immediately post-glacial period, the Appalachian Mountains have remained above sea level and thus have served as an effective north-south migration corridor. This has resulted in a blending of northern and southern floral and faunal elements in the Atlantic region. The unique mixture of forested and non-forested ecosystems in the Maritimes has been recognized by Canadian and North American classification frameworks as a definable forest region called the Acadian Forest or, more recently, the Atlantic Maritime Ecozone.”

The forests of the Atlantic Maritime Ecozone at the time of European settlement in the early 1600s had been little impacted by the indigenous peoples of the region and has been described as “‘*primeval*’ forests that included pine, hemlock, cedar, spruce, fir, and a number of hardwood species”, referring to forests in the present Annapolis County of Nova Scotia across the Bay of Fundy from the present city of Saint John, New Brunswick (Loo & Ives 2003: 46). The primary forests of N.B. were largely spared until the early 1800s when logging began in earnest, especially along streams and rivers that could float logs to the coast. Old growth white pine, which could reach five feet in

diameter in such forests, was among the first species to be selectively logged. Farming became popular as the land was cleared and the present-day Oak Bay area that is largely forested today was likely farmland until well into the 1900s. Farming fell into decline as the people turned to other professions and farmland slowly reverted to forest over much of the region (Zelazny 2007). The secondary forest that exists today is less diverse than the original forest and is characterized by younger trees, averaging ca. 50 years old rather than 200+. Common tree species are balsam fir, red maple, white spruce, white birch, poplar, and alder (Loo & Ives 2003).

Materials & Methods

Main study site

The main study site was located on the west side of Route 170 on a private property beside the popular Oak Bay Snack & Dairy Bar. Between the back of the property and the NB Route 1 highway one kilometre to the west is unbroken forest. The rest of the surrounding area is a mix of forest and agricultural fields, with a network of rural roads and scattered private properties. Five Malaise traps were set up along the sides and back of the property at the locations indicated in the aerial view shown in Fig. 2. A distance of 120 metres separated the traps on either side of the property and the elevation of the traps averaged 23 metres above sea level. Additional details about the style, position, and duration of each trap are given below.

Location 1 (Fig. 3), 45.22510°N 67.19585°W. A 6-metre Malaise trap was set up against treeline at the back of property with one end facing east into the yard. No collecting head was attached to the back of the trap, which was among the trees. The trap head at the front was run “dry” (no ethanol) with a small piece of Ortho® Home Defense® Max™ No-Pest® Insecticide Strip as the killing agent. The head was emptied once or twice a day, removed from the trap after dusk, and replaced the next morning. The sampling period was 11 days from 28 June to 8 July 2022.



Figure 2. Aerial view of locations of the five Malaise traps on a property along Route 170 through Oak Bay, New Brunswick. A 6-metre trap was in location 1, a Bugdorm and a Sante trap were in locations 2 and 3 (reversed halfway through survey), and two Bugdorm traps were in locations 4 and 5 (trap catches were combined).

Location 2 (Fig. 4), 45.22424°N 67.19549°W and **location 3** (Fig. 4), 45.22424°N 67.19534°W. A BugDorm ez-Malaise trap was placed in location 2 on 27.vi.2022 and a Sante Malaise trap was placed in location 3 on the same day. The backs of each were positioned against a row of trees, mostly overgrown alders, that mark the property line. Traps were 12 metres apart. The heads were facing north and the traps were partially shaded during the day. Both traps were run “wet” with 75% ethanol. Contents of the heads were emptied into jars of fresh 75% ethanol at two intervals, 27–29.vi.2022 and 30.vi.–3.vii.2022. The locations of the two traps were switched during early afternoon on the last day of the second interval (3.vii) with the BugDorm trap moving to location 3 and Sante trap to location 2. Contents of the heads were emptied and preserved as before at two intervals, 3–5.vii.2022 and 6–8.vii.2022. The total sampling period was 12 days from 27 June to 8 July 2022. These traps were reversed halfway through the sampling period so that the performance of the BugDorm and Sante traps could be compared without location bias in a future *Fly Times* article (see similar test of the two trap styles by Sharkey & Brown 2022).

Locations 4 and 5 (Fig. 5), both averaged to the coordinates 45.2252°N 67.1957°W. Two BugDorm ez-Malaise traps were set up in these locations. Trap 4 was placed on grass with the head facing south and back against a grassy meadow. Trap 5 was placed in the meadow with head facing east and back against a small shrub. Traps heads were run “dry” in the same manner as explained for the 6-metre trap, and heads were removed and replaced according to the same daily schedule. Daily samples were pooled from the two traps and treated as a single collecting event. Sampling period was 6 days from 3–8 July 2022.

Additional collecting sites

With the exception of one specimen caught at Todds Point (see below), all specimens not collected at the main study site were caught on three hilltops 10–15 kms south-southeast of Oak Bay, half to three-quarters of the way to St. Andrews along Route 127.



Figure 3. Six-metre Malaise trap in location 1 at the back (west side) of property. The collecting head was attached only at the front (east-facing) end.



Figure 4. Two Malaise traps along the property line on the south side of property. A Sante Malaise trap is in the foreground in location 3 and a BugDorm ez-Malaise trap is in the background in location 2. These traps were reversed halfway through the sample period.



Figure 5. Two BugDorm ez-Malaise traps on the north side of property, one on the edge of a meadow in location 4 and the other in the meadow in location 5.

Chamcook Mountain (Figs. 6, 9–13), 45.1250°N 67.0833°W, 190 metres (summit). The summit is granite and covers a broad dome-like area consisting of a complex mix of bare rock, conifers, patches of low vegetation, and damp mossy spots. Just a few metres below the summit is a grassy and partially-shaded area with wildflowers that was frequented by a few species of tachinids (Fig. 13). Flies were collected from the ground, tree trunks, and vegetation from mid-morning to mid-afternoon. They were collected into 50 ml conical centrifuge tubes charged with 1,2-dichloroethane as the killing agent. Dead specimens were transferred to a tissue-lined container after ca. 30 minutes in a killing tube. Collecting took place on three warm and sunny days, 28 & 29 June and 4 July 2022. For more information about Chamcook Mountain and the Rossmount Historical Nature Trail leading to its summit, see: <https://www.hikingnb.ca/Trails/FundyWest/StAndrews/ChamcookMountain.html>.

Chamcook Tower (Figs. 7, 14–16), 45.1254°N 67.0931°W, 160 metres (summit). This location gets its name from the huge communications tower on its granite summit (Fig. 7). Vegetation is generally low-lying and sparse on the broad rocky summit, with full-sized trees mostly confined to the outer edges and mountain sides (Fig. 14). Lowbush blueberry (*Vaccinium angustifolium*) (Fig. 15) grows among the rocks on the summit, a plant I did not see on the summit of Chamcook Mountain. This hilltop was visited once in mid-afternoon on 4 July after collecting earlier on Chamcook Mountain. Despite a careful search of the area and the weather being warm and sunny, no tachinids were seen on the ground or vegetation. The only tachinids captured were those landing on the sides of a concrete building to one side of the tower (Fig. 16). They were killed and stored as per Chamcook Mountain specimens.

Simpson Hill, Table Top (Figs. 8, 17), 45.1654°N 67.1279°W, 175 metres (summit), 45.1645°N 67.1265°W, 160 metres (collecting site off-summit). This hilltop is much different from the other two. It is granite like the others but much more rugged, with hollows and outcrops sparsely covered with conifers and patches of low vegetation (Fig. 8). It was visited once in late morning on a sunny and warm day, 7 July. After a careful inspection of the diverse hilltop area for about an hour, only two tachinids were captured. However, on our way down the mountain and only ca. 15 metres below the summit we passed through a profusion of ferns lit by patchy sunlight. Tachinids were common here and were collected from sunlit fern fronds. Specimens were killed and stored in the manner explained above. Information about the multiple trails on Simpson Hill can be found here: <https://www.hikingnb.ca/Trails/FundyWest/SimpsonHill.html>.

Todds Point (Fig. 18), 45.1713°N 67.1602°W, 5 metres. This location is at the southern tip of a short peninsula west of Simpson Hill on the far side of the St. Croix River. One tachinid was swept from a tree leaf on the bluff overlooking the view in Fig. 18 on 2 July 2022. It was killed and stored in the manner explained above.

Preparation and identification of specimens

Specimens collected by sweep net. These were specimens caught on hilltops and at Todds Point. They were killed with 1,2-dichloroethane and then transferred to tissue-lined containers as explained above. Specimens killed in

this manner often stiffen up and a night in a relaxing container, either at room temperature or in a refrigerator, is usually long enough for them to become soft and pliable (too long and they will become moldy). The relaxing containers I used were plastic with a layer of damp sphagnum moss on the bottom (Figs. 20, 21). A small dish for holding specimens was placed on top of the moss. A piece of tissue between the dish surface and specimens prevented contact between the two, to avoid any moisture condensing on the dish from turning the bodies “greasy”. Specimens were pinned the next day following the methods I explained in a previous *Tachinid Times* article (O’Hara 2021).

Malaise-trapped specimens killed with No-Pest® strip. Each day’s catch from the traps in locations 1 (6-metre trap), 4 and 5 (BugDorm traps) were frozen overnight and tachinids were sorted from them the next morning (Fig. 19). Tachinids were placed in relaxing containers (Figs. 20, 21) until evening or the next day and then pinned (as described in previous paragraph). Non-tachinids were preserved in 75% ethanol for other CNC staff members to examine.

Malaise-trapped specimens collected into ethanol. These samples from traps in locations 2 and 3 were transferred to fresh 75% ethanol and stored in glass jars. Tachinids were sorted from them a few weeks later in Ottawa. Specimens were treated in batches, each batch representing a trap sample. Each batch was treated as follows: specimens transferred to 95% ethanol for roughly 12 hours, transferred to ethyl acetate for a similar amount of time, air-dried on tissue paper, and glued to the side of pins with white glue.

Pinned specimens. All specimens pinned fresh or mounted from ethanol were entered into the CNC specimen database with the pertinent data, assigned CNC database numbers, and labelled appropriately. Only DNA barcoded specimens from this study have been assigned names to the genus or species level in the database.

Identification and DNA barcoding. Specimens were sorted to tentative morphospecies and initial identifications were performed to genus and/or species with the help of the genus key of Wood (1987b) and by comparisons with identified specimens in the CNC. One or more specimens of all the presumed species were selected for DNA barcoding of the CO1 gene. A leg from each of them was sent to the Biodiversity Institute of Ontario (BIO) at the University of Guelph for the DNA barcoding. The resultant sequences are maintained in the Barcode of Life Data Systems (BOLD) repository and were compared to my “DNA barcode library” of over 4000 CNC Tachinidae in BOLD to determine which specimens could be identified as described species with a high degree of certainty, and which could be identified only to genus. Specimens in the latter category were assigned numbers preceded by “NB” (e.g., *Winthemia* sp. NB1, Fig. 27). Most specimens not identified to a named species belong to unresolved species complexes (possibly including undescribed species); in these instances there could be several species under one name, or several names and several similar species that cannot be properly matched.



Figures 6–12. 6. Spruce tree on summit of Chamcook Mountain where specimens of *Winthemia* sp. were station-taking on branches around chest height. 7. Communication tower on summit of Chamcook Tower. 8. Rugged granite summit of Simpson Hill. 9. Flat granite summit of Chamcook Mountain. 10. Male of *Winthemia* sp. station-taking on branch of spruce in Fig. 6. 11. Another view of granite summit of Chamcook Mountain from mound of sphagnum moss. 12. Sheltered sunny spot among spruce trees on Chamcook Mountain summit where some hilltopping tachinids landed on the ground and others on lower portions of tree trunks.



Figures 13–18. 13. Grassy and partially shaded area just below summit of Chamcook Mountain. 14. View westward of St. Croix River from summit of Chamcook Tower. 15. Lowbush blueberry on Chamcook Tower summit. 16. *Billaea* sp. on side of building on Chamcook Tower summit in typical dexiine head-down station-taking position. 17. Fern-lined trail below summit of Simpson Hill where male tachinids were common. 18. View south of rocky beach along St. Croix River at Todds Point.



Figures 19–23. **19.** A day’s catch from the 6-metre Malaise trap ready for sorting after a night in freezer. **20.** Tachinids in a relaxing container with sphagnum moss. **21.** Closed relaxing container that will be left for the rest of the day or overnight before tachinids are pinned. **22.** Most of the pinned insects in their travel containers at end of collecting period. **23.** Alcohol material at end of collecting period, comprising unsorted samples from traps in locations 2 and 3 and trap residues (i.e., samples minus tachinids) from traps in locations 1, 4 and 5.

Checklist of Tachinidae of the Canadian Maritimes

The Tachinidae of New Brunswick are not particularly well known. The same can be said of Nova Scotia, and the tachinids of Prince Edward Island are even less known. Perhaps a somewhat more accurate measure of the tachinids in these Maritime provinces can be realized by treating them collectively rather than individually. The checklist of world Tachinidae (O’Hara et al. 2020) does not differentiate distributions at this fine a level and instead treats the three Maritime provinces in the “East” category of Canada along with Ontario, Québec, and the province of Newfoundland and Labrador. The earlier catalogue of O’Hara & Wood (2004) of the tachinids of America north of Mexico provided more detail and often cited Maritime provinces by name. I have prepared, and appended here, a checklist of the Tachinidae of the Canadian Maritimes to provide some clarity on the species known from the region.

This checklist has been developed mostly from the aforementioned checklist and catalogue. First, a list of tachinids belonging to the “East” category of Canada was generated from the current database of world Tachinidae—the same database that generated the world checklist of O’Hara et al. (2020) (as explained in O’Hara & Henderson 2022). This list was then compared to the catalogue of O’Hara & Wood (2004) and shortened to include only the species recorded from the Maritimes. A few species could not be reliably included or excluded based on these

sources and decisions about them were made by checking their distributions in the CNC. This seemed like a reasonable solution given that the CNC had been surveyed by state and province during the development of the earlier 2004 catalogue. As a last step, species newly recorded from New Brunswick in the present survey were added. The resulting checklist of Maritime Tachinidae is, like most species lists, a work in progress and is limited in its completeness by such factors as identification difficulties and unrecorded species.

Results and Discussion

The state of tachinid taxonomy is somewhere between that of the poorly known Neotropical fauna and the exceptionally well-known European fauna. There has not been the same amount of taxonomic study of tachinids here in North America as in Europe and this is reflected in the level of determinations that are possible in a survey like this. We have fairly well-established and recognizable genera for the most part but difficulty at the species level in many of them, mainly because of: 1) unresolved species complexes (usually comprising both named and unnamed species), 2) undescribed species, and 3) misidentifications in collections (e.g., when more than one species is found under one name).

There is a work-around to this “taxonomic impediment” that is common to tachinid surveys like this one, and the one by Stireman & Perilla Lopez in this same issue of *Tachinid Times*. We can number species, as I have done here with the abbreviations “NB1”, “NB2”, etc., or use terms like “nr.” and “cf.” in association with a named species as the other authors have. This permits a more accurate assessment of species diversity even if names cannot be assigned to all species. I also have had the opportunity to compare the DNA barcodes of specimens of my initial species with my other DNA barcodes in BOLD, allowing for a re-evaluation of identifications.

Results

The weather was warm throughout the survey period with the usual maritime mix of sunny, cloudy and rainy periods, sometimes all in the same day. A remarkably high number of tachinid specimens and species were recorded over the 12 days. The total number of tachinid specimens caught, pinned and identified was 736 and tachinid diversity was 98 species. The names and numbers of the 98 species are listed in Table 1 by trap and hilltop, and also by sex. The Malaise traps were the big performers in terms of both specimens and species, although hand-collecting on hilltops added some species not captured in the traps. This brief survey produced more specimens and species of Tachinidae than an insect survey of Cape Breton Highlands National Park in northern Nova Scotia conducted by CNC staff over the summers of 1983 and 1984, which resulted in 430 specimens and 60+ species of Tachinidae (Wood 1987a: 113).

The 98 species caught during this survey are included in the appended *Checklist of Tachinidae of the Canadian Maritimes* and are indicated with a red asterisk (*). Sixty-nine of them have species names and 29 are listed with species numbers (NB1, etc.). All but two have accompanying DNA barcodes, with the two that are missing having failed during sequencing (*Ateloglossa cinerea* Coquillett and *Billaea* sp. NB1). Barcoded specimens are indicated in the list by their CNC database numbers and sex. Identifications of certain species are discussed in notes in the checklist.



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Figures 24–29. Some of the tachinids caught during this survey. **24.** *Epigrimyia illinoensis* Robertson (Dexiinae, Epigrimyiini), CNC1966328♂, 4.9mm. **25.** *Eutrixa* sp. NB1 (Dexiinae, Eutrixini), CNC1966152♀, 5.7mm. **26.** *Triarthria setipennis* (Fallén) (Tachininae, Bigonichetini), CNC1966496♀, 6.2mm. **27.** *Winthemia* sp. NB1 (Exoristinae, Winthemiini), CNC1990898♂, 10.9mm. **28.** *Chrysotachina infrequens* O’Hara (Tachininae, Polideini), CNC1966401♂, 7.9mm. **29.** *Siphona* (*Siphona*) *geniculata* (De Geer) (Tachininae, Siphonini), CNC1966172♂, 4.7mm.

Table 1. List of the 98 tachinid species collected in the Oak Bay area of southeastern New Brunswick, Canada, 27 June to 8 July 2022, with specimen numbers per species and location. Specimens were collected using five Malaise traps in locations 1 to 5 on private property in Oak Bay (Figs. 2–5), and by hand collecting with an insect net on three local hilltops (Figs. 6–17) and at Todd’s Point (Fig. 18) (see Materials and Methods for details). Most specimens not identified to a named species belong to unresolved species complexes (see species notes in *Checklist of Tachinidae of the Canadian Maritimes* at the end of this article). M = male(s), F = female(s).

Species list	Location 1 6m Malaise		Locations 2&3, mixed Malaise traps		Locations 4&5, Bugdorm Malaise traps		Chambook Mtn. & Tower		Simpson Hill		Specimen numbers
	M	F	M	F	M	F	M	F	M	F	
Dexiinae, Dexiini											
<i>Atelogglossa cinerea</i> Coquillett	2										2
<i>Billaea</i> sp. NB1							20*				20
<i>Ptilodexia mathesoni</i> (Curran)				1							1
Epigrimyiini											
<i>Epigrimyia illinoensis</i> Robertson	4	1			2						7
Eutherini											
<i>Euthera tentatrix</i> Loew	2	2		1							5
Eutrixini											
<i>Eutrixia</i> sp. NB1		1									1
<i>Eutrixia</i> sp. NB2				1							1
Uramyini											
<i>Uramya limacodis</i> (Townsend)							5				5
Voriini											
<i>Athrycia cinerea</i> (Coquillett)		1									1
<i>Campylocheta</i> sp. NB1		2					1				3
<i>Campylocheta</i> sp. NB2			1								1
<i>Campylocheta</i> sp. NB3	2	7		1							10
<i>Periscepsia clesides</i> (Walker) complex	5							1			6
<i>Periscepsia helymus</i> (Walker)		1		1							2
<i>Spathidexia dunningii</i> (Coquillett)	2		1		1						4
<i>Spathidexia</i> sp. NB1		1									1
<i>Thelaira americana</i> Brooks		1		1			1		1		4
Exoristinae, Blondeliini											
<i>Admontia degeeroides</i> (Coquillett)	2	6		6							14
<i>Admontia</i> sp. NB1		1									1
<i>Belida chaetoneura</i> (Coquillett)							20				20
<i>Blondelia eufitchiae</i> (Townsend)	1										1
<i>Compsilura concinnata</i> (Meigen)				2							2
<i>Cryptomeigenia hinei</i> (Coquillett) complex				2							1
<i>Cryptomeigenia theutis</i> (Walker) complex		5		11							16
<i>Euthelyconychia xyloa</i> (Curran)		2		2		2			2		8
<i>Lixophaga</i> sp. NB1	5				1	1					7
<i>Lixophaga</i> sp. NB2	2		2	1			1				6
<i>Lixophaga</i> sp. NB3							1				1
<i>Medina spinosa</i> (Coquillett)							3				3
<i>Medina</i> sp. NB1		1				1					2
<i>Medina</i> [unassociated females]		2				1					3
<i>Myiopharus aberrans</i> (Townsend)		1									1
<i>Oswaldia albifacies</i> (Townsend)	4										4
<i>Oswaldia assimilis</i> (Townsend)	1		3		9	1					14
<i>Oswaldia</i> sp. NB1						1	9		8		18
<i>Oswaldia</i> sp. NB2						1					1
<i>Oswaldia</i> sp. NB3	1				1						2
<i>Paracraspedothrix angulicornis</i> (Curran)		1									1
<i>Phyllophilopsis nitens</i> (Coquillett)									2		2

Species list	Location 1 6m Malaise		Locations 2&3, mixed Malaise traps		Locations 4&5, Bugdorm Malaise traps		Chambook Mtn. & Tower		Simpson Hill		Specimen numbers
	M	F	M	F	M	F	M	F	M	F	
Eryciini											
<i>Aplomya theclarum</i> (Scudder)										1	1
<i>Drino</i> (<i>Drino</i>) sp. NB1	1	1									2
<i>Hubneria estigmenensis</i> (Sellers)	2										2
<i>Lydella radialis</i> (Townsend)		1									1
<i>Lydella thompsoni</i> Herting	1	1									2
<i>Nilea mathesoni</i> (Reinhard)		2		1							3
<i>Nilea</i> sp. NB1	1										1
<i>Phebellia cerurae</i> (Sellers)		1									1
<i>Phryxe pecosensis</i> (Townsend)		1									1
Exoristini											
<i>Austrophorocera</i> sp. NB1		1									1
<i>Exorista</i> (<i>Adenia</i>) <i>dydas</i> (Walker)	1	1									2
<i>Parasetigena silvestris</i> (Rob.-Des.)		1					14				15
<i>Tachinomyia apicata</i> Curran		1									1
Goniini											
<i>Euexorista rebaptizata</i> Gosseries	2	1									3
<i>Platymya confusionis</i> (Sellers)		3	1		1		3				8
<i>Pseudochaeta</i> (<i>Pseudo.</i>) <i>siminina</i> Reinhard	1										1
Winthemiini											
<i>Winthemia occidentis</i> Reinhard									2		2
<i>Winthemia rufopicta</i> (Bigot)		4									4
<i>Winthemia</i> sp. NB1		1					22		1		24
<i>Winthemia</i> sp. NB2		1					8				9
<i>Winthemia</i> sp. NB3		2		1							3
Phasiinae, Cylindromyiini											
<i>Cylindromyia</i> (<i>Cylin.</i>) <i>euchenor</i> (Walker)	1	3									4
<i>Cylindromyia</i> (<i>Neocyp.</i>) <i>interrupta</i> (Meigen)	3	5					4				12
<i>Hemyda aurata</i> R.-D.							1				1
Gymnosomatini											
<i>Euclytia flava</i> (Townsend)	1										1
<i>Gymnoclytia occidua</i> (Walker)	6	9		1							16
<i>Gymnosoma par</i> Walker				2							2
Phasiini											
<i>Phasia robertsonii</i> (Townsend)		4									4
Strongygastrini											
<i>Strongygaster triangulifera</i> (Loew)	4	7				1					12
Tachininae, Bigonichetini											
<i>Triarthria setipennis</i> (Fallén)		4		3							7
Ernestiini											
<i>Linnaemya</i> (<i>Ophina</i>) <i>glauca</i> (Brooks)	3										3
<i>Linnaemya</i> sp. NB1	5		1				1				7
Graphogastrini											
<i>Graphogaster</i> sp. NB1		2		1							3
<i>Graphogaster</i> sp. NB2	1										1
<i>Phytomyptera palpigera</i> (Coquillett)		1		1							2
<i>Phytomyptera</i> sp. NB1		1		1							2
Leskiini											
<i>Clausicella turmalis</i> (Reinhard)		4		1							5

Species list	Location 1 6m Malaise		Locations 2&3, mixed Malaise traps		Locations 4&5, Bugdorm Malaise traps		Chambook Mtn. & Tower		Simpson Hill		Specimen numbers
	M	F	M	F	M	F	M	F	M	F	
<i>Genea tenera</i> (Wiedemann)			1								1
<i>Genea texensis</i> (Townsend) complex			1	1							2
Polideini											
<i>Chrysotachina infrequens</i> O'Hara	2										2
<i>Hystericia abrupta</i> (Wiedemann)	1				1						2
<i>Lydina</i> sp. NB1						1					1
Siphonini											
<i>Actia diffidens</i> Curran	1	5	3	10	1						20
<i>Actia dimorpha</i> O'Hara	1	3		2	1	1					8
<i>Actia interrupta</i> Curran	1	5		2							8
<i>Ceromya bicolor</i> (Meigen)		1									1
<i>Ceromya oriens</i> O'Hara				1							1
<i>Siphona (Ceranthis) flavipes</i> (Coquillett)		1									1
<i>Siphona (Siphona) geniculata</i> (De Geer)	91	138	24	21	7	3					284
<i>Siphona (Siphona) hokkaidensis</i> Mesnil	2	1	3	3	2						11
<i>Siphona (Siphona) intrudens</i> Curran				1							1
<i>Siphona (Siphona) maculata</i> Staeger				4							4
<i>Siphona (Siphona)</i> sp. NB1				1							1
<i>Siphona sensu lato</i> sp. NB1			1								1
Tachinini											
<i>Archytas (Nemochaeta)</i> sp. NB1	2	1									3
<i>Epalpus signifer</i> (Walker)		1		7							8
<i>Pararchytas decisus</i> (Walker)	1										1
<i>Peleteria (Sphyrimyia) haemorrhoea</i> (Wulp)	1		1								2
Unplaced genera of Tachininae											
<i>Eulasiona comstocki</i> Townsend**											1
Unplaced tribe of Tachinidae, Myiophasiini											
<i>Cholomyia inaequipes</i> Bigot				1							1
Specimen totals	169	255	43	95	26	20	109	1	17	0	736

*The only specimens collected on the Chamcook Tower hilltop were 7 males of *Billaea* sp. NB1 and they are included here.

** One male of *E. comstocki* was collected at Todds Point, the only specimen collected from that location (no separate column included).

One species deserves special mention. Not often does a single tachinid species strikingly dominate in numbers over all others during a survey. Nor would one expect it to be a new record for the region, or be an introduced biological control agent released 50 years ago with no recorded establishment. Yet this is true of the diminutive *Siphona geniculata* (De Geer) (Fig. 29), introduced from Europe to the lower Fraser Valley of British Columbia between 1968 and 1975 and to Newfoundland in 1973–74 for control of a crane fly pest, *Tipula paludosa* Meigen (Wilkinson 1984). It became established in British Columbia but there has been no record of recovery in Newfoundland or of its presence anywhere else in eastern North America. It accounted for 284 of the 736 specimens of Tachinidae collected during the survey, or 39% of the total. I have confirmed its identification by morphology, and its DNA barcode matches that of European specimens on BOLD. Is this population descended from the release of *S. geniculata* in Newfoundland half a century ago? Perhaps so, if it is found to be widespread in eastern Canada, especially Newfoundland. It has not been caught around Ottawa.

The clear winner among the Malaise traps was the 6-metre one (Fig. 3, Tables 1, 2). It can be set up to catch specimens at both ends but I used it with only one head attached, the one facing east into the yard and unobstructed by the trees at the other end. Even with only one functional head, it caught more than double the number of tachinid specimens than the other four Malaise traps combined (424 vs. 184), or 1.5X as many with *S. geniculata* removed. It also ranked first in the number of species caught (72) and the number of unique species caught (31, or nearly one-third of all species) (Table 2), numbers significantly higher than those for the other traps even with the tachinids of two hedge-row traps combined (locations 2 & 3, Fig. 4) and the two other traps combined (locations 4 & 5, Fig. 5). I felt that the 6-metre trap was the best placed of the five traps on the property and this likely contributed to its high yield, but it is nevertheless deserving of its reputation among my colleagues as far superior at catching tachinids than the Sante and Bugdorm Malaise traps.

	6-metre Malaise trap	Hedge row Malaise traps 2 & 3	Malaise traps 4 & 5	Hilltops	Todds Point
6-metre Malaise trap		35	16	10	0
Hedge row Malaise traps 2 & 3			20	5	0
Malaise traps 4 & 5				3	0
Hilltops					0
Total species for each	72	53	20	19	1
Unique species for each	31	13	0	8	1

Table 2. The upper portion of this table shows the numbers of species in common among the three trap locations and the combined hilltops, along with the single species from Todds Point. The second row from the bottom shows the total number of species recorded for each trap location and combined hilltops. The bottom row shows the number of species unique to each category (e.g., 31 species caught only in the 6-metre Malaise trap).

The three hilltops did not contribute substantially to the survey's total with just 127 specimens belonging to 19 species (8 species unique to the hilltops, Table 2). The hilltops were clearly functioning as aggregation sites for mating, with males waiting in particular species-specific places for conspecific females. One indication of this was the preponderance of males collected: 126 males vs. 1 female. Another indication was the replacement of captured males by new conspecific males at their station-taking sites. The general *modus operandi* for tachinids is to hilltop on sunny days, arrive and depart at more or less predetermined times based on species and temperature, and take

up positions that are instinctually predetermined and species-specific (e.g., Fig. 10). Females arrive, locate a conspecific male, and fly off somewhere to mate. The male possibly returns to its preferred spot to mate again but the female departs. Hence, females are only briefly present and rarely caught whereas males may be plentiful and easily caught.

Hilltops can vary from no tachinids at all to phenomenally productive and I often cannot predict what I will find when I get there, even when temperature, sun and time seem right. But I can suggest why relatively few tachinid species were caught during the three visits to Chamcook Mountain (Figs. 6, 9–13). A classic hilltop from a collector's point of view is one with a small and pointed summit and relatively low vegetation; not much higher than the top of an extended insect net. When tall trees are present, they draw some species higher above the ground and out of reach of nets. Chamcook Mountain is not a classic hilltop; it is a complicated one with a broad granite summit and trees (mostly spruce) around the edges (Figs. 9, 11), and with sunny openings here and there among the trees (Fig. 12). It is likely a good hilltop with a lot of tachinid species in different places but because of the complexity of the summit I only found a few of the favoured locations. An interesting account of tachinid hilltopping behavior was given by Monty Wood in an early issue of *Tachinid Times* (Wood 1996) based on years of observations on hilltops in western Québec.

Simpson Hill (Fig. 8, 17) has a more rugged summit than Chamcook Mountain and also a more clearly defined high point. I expected to see some male tachinids congregating there but I saw none at all. There were small microhabitats under the scattered trees, in sheltered areas among rocks, and even a small pond edged with grasses and other vegetation. The day was sunny and warm and the place looked promising but only two males of *Euthelyconychia xylota* (Curran) were caught, not far from one another on low-lying vegetation. Six more species (Table 1) were caught a short way down the trail from the summit on fern fronds in patchy sunlight (Fig. 17). Only males were caught and their behavior can be considered “hilltopping” as they were presumably there to mate, even though they were not at the actual summit. I have noticed this off-summit hilltopping before. Curiously, *Oswaldia* sp. NB1 and *Winthemia* sp. NB1 were caught hilltopping on the summit of Chamcook Mountain and were below the summit at Simpson Hill.

Closing Remarks

Taxonomy is a scientific discipline that seeks to categorize life on earth. When it comes to invertebrates, some are taxonomically better known than others and for those in the latter group there can be many unknowns: how to identify described species, how to recognize “new” species, what are the distributions of species, and for parasitoids like Tachinidae, what are their hosts? Species inventories and surveys can offer a faster route towards some level of understanding of a difficult group by providing preliminary information about the species present in an area as well as specimens for future revisionary studies. This brief survey from one area in southeastern New Brunswick is intended to contribute towards this goal in Nearctic Tachinidae.

This survey benefited greatly from molecular data in the form of so-called “DNA barcodes” that were available for nearly all species. This step was expensive and not an option for everyone, but it is a valuable complement to morphological identifications. Matches between barcodes from previously collected specimens and Oak Bay

specimens were highly congruent within species. The one exception was the genus *Medina* where two or more morphospecies have the same DNA barcode. This interesting outcome deserves further investigation.

I will end on a cautionary note. Taxonomic surveys are becoming easier with the advent of molecular identifications. This is good news, but there is also a danger that molecular identifications will largely replace morphological identifications even in groups like Tachinidae where many species names are unstable. Platforms attach tachinid names to molecular data based on the names of identified specimens in collections, but it is the nature of insect collections for names to change through curation as groups become better known. A 100% match between a reference sequence and an unidentified sequence will produce a result only as reliable as the identification of the reference specimen.

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References

- Gates, M.W., Lill, J.T., Kula, R.R., O'Hara, J.E., Wahl, D.B., Smith, D.R., Whitfield, J.B., Murphy, S.M. & Stoepler, T.M. 2012. Review of parasitoid wasps and flies (Hymenoptera, Diptera) associated with Limacodidae (Lepidoptera) in North America, with a key to genera. *Proceedings of the Entomological Society of Washington* 114: 24–110.
- Loo, J. & Ives, N. 2003. The Acadian Forest: historical condition and human impacts. *The Forestry Chronicle* 79: 462–474.
- O'Hara, J.E. 2021. How to make your tachinids stand out in a crowd. *The Tachinid Times* 34: 42–52.
- O'Hara, J.E. & Henderson, S.J. 2022. Cataloguing the world Tachinidae (Diptera). *The Tachinid Times* 35: 4–21.
- O'Hara, J.E., Henderson, S.J. & Wood, D.M. 2020. Preliminary checklist of the Tachinidae of the world. Version 2.1. PDF document, 1039 pages. Available at:
<http://www.nadsdiptera.org/Tach/WorldTachs/Checklist/Worldchecklist.html>.

- O'Hara, J.E. & Wood, D.M. 2004. Catalogue of the Tachinidae (Diptera) of America north of Mexico. *Memoirs on Entomology, International* 18: iv + 410 pp.
- Sabrosky, C.W. 1975. *Chaetophlepsis plathypenae*, a new parasite of the green cloverworm, with a key to *Chaetophlepsis* and *Parahypochaeta* (Diptera, Tachinidae). *Annals of the Entomological Society of America* 68: 43–50.
- Sharkey, M.J. & Brown, B.V. 2022. Superiority of the Sante Traps Malaise trap design over the Bugdorm EZ Malaise trap. *Fly Times* 68: 62–64.
- Wilkinson, A.T.S. 1984. *Tipula paludosa* Meigen, European crane fly (Diptera: Tipulidae). Pp. 85–88. *In*: Kelleher, J.S. & Hulme, M.A., eds., *Biological control programmes against insects and weeds in Canada 1969–1980*. Commonwealth Agricultural Bureaux, Slough, England. x + 410 pp.
- Wood, D.M. 1985. A taxonomic conspectus of the Blondeliini of North and Central America and the West Indies (Diptera: Tachinidae). *Memoirs of the Entomological Society of Canada* 132: 1–130.
- Wood, D.M. 1987a. Order Diptera. Pp. 129–194. *In*: Lafontaine, J.D., Allyson, S., Behan-Pelletier, V.M., Borkent, A., Campbell, J.M., Hamilton, K.G.A., Martin, J.E.H. and Masner, L., eds., *The insects, spiders and mites of Cape Breton Highlands National Park*. Agriculture Canada, Research Branch, BRC Report 1. 302 pp.
- Wood, D.M. 1987b. Tachinidae. Pp. 1193–1269. *In*: McAlpine, J.F., Peterson, B.V., Shewell, G.E., Teskey, H.J., Vockeroth, J.R. & Wood, D.M., eds., *Manual of Nearctic Diptera*. Volume 2. Agriculture Canada Monograph 28: vi + 675–1332.
- Wood, D.M. 1996. Hilltopping Tachinidae from western Quebec. *The Tachinid Times* 9: 5–8.
- Zelazny, V.F., ed. 2007. *Our landscape heritage: the story of ecological land classification in New Brunswick*. Second Edition. New Brunswick Department of Natural Resources, Fredericton. xii + 359 pp.

Checklist of Tachinidae of the Canadian Maritimes

... including species caught in the Oak Bay area of New Brunswick in 2022

The 232 numbered species in the checklist below represent all of the described species recorded from any of the three provinces of the Canadian Maritimes. It was compiled as explained in the Materials and Methods. Only species with nomenclaturally valid names are numbered. Additional species that were caught in 2022 but cannot be assigned a name are listed as “[genus name] sp. NB1”, “... NB2” or “... NB3”.

Specimens that were DNA barcoded (ca. 190) are indicated by their CNC database number and sex, beginning with “CNC”. The known distributions of named species are given in more detail than in O’Hara et al. (2020) for the region of Canada called “East” in that checklist. It is divided here into Québec, Maritimes [N.B., N.S. and P.E.I.], Newfoundland, and Labrador [the last two a single province but treated separately].

As noted in the Materials and Methods section: “Most specimens not identified to a named species belong to unresolved species complexes; in these instances there could be several species under one name, or several names and several similar species that cannot be properly assigned.”

Summary of findings

Number of named and numbered species: **232**

Number of species caught in 2022 (indicated with *): **98**

Number of species DNA barcoded: 96

Number of species caught that could be named (species number in red followed by *): 69

Number of species caught that could not be named (no species number but with *): 29

New records for Canadian Maritimes, not new for Canada (in red): **15**

New records for Canada and Maritimes (in red): **2**

New record for eastern Canada and Maritimes (in red): **1**[†]

[†]This species, *Siphona geniculata* (De Geer), is also reported for the first time from the United States (from Washington state, USA).

DEXIINAE, Dexiini

1. *Ateloglossa algens* (Curran)

Distribution. Nearctic: Canada (Yukon, Prairies, Ontario, Québec, Maritimes), USA (Southwest).

2.* *Ateloglossa cinerea* Coquillett, CNC1966405♂ (DNA barcode failed).

New record for Maritimes.

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast).

* *Billaea* sp. NB1, CNC1966642♂ (DNA barcode failed), CNC1966711♂, CNC1966712♂

Note: There are six species of *Billaea* Rob.-Des. recorded from Canada but none east of Québec. Twenty specimens were caught on hilltops, all males. *Billaea* is in need of revision and I cannot reliably identify specimens; the two DNA barcodes obtained here match those for a mixed series CNC specimens of both *B. nipigonensis* Curran and *B. trivittata* (Curran).

3. *Estheria cinerea* (Townsend)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

4. *Ptilodexia canescens* (Walker)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Northern Rockies, Southwest, Great Plains, Northeast).

5. *Ptilodexia carolinensis* Brauer & Bergenstamm

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast).

6.* *Ptilodexia mathesoni* (Curran), CNC1967116♀

Distribution. Nearctic: Canada (Prairies Ontario, Québec, Maritimes), USA (Northeast).

7. *Ptilodexia obscura* West

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast).

8. *Ptilodexia rufipennis* (Macquart)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Pacific Northwest, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast, Florida).

9. *Zelia metalis* (Reinhard)

Distribution. Nearctic: Canada (B.C., Maritimes), USA (Great Plains, Texas, Northeast, Southeast).

Epigrimyini

10.* *Epigrimyia illinoensis* Robertson (Fig. 24), CNC1966327♂,

CNC1966398♀. **New record for Maritimes.**

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Great Plains, Texas, Northeast, Southeast).

Eutherini

11.* *Euthera tentatrix* Loew, CNC1966038♂, CNC1966388♀. **New record for Maritimes.**

Distribution. Nearctic: Canada (Ontario, Maritimes), USA (California, Southwest, Great Plains, Texas Northeast, Southeast, Florida). Neotropical: Greater Antilles (Bahamas).

Eutrixini

12. *Eutrixia exilis* (Coquillett)? [two spp. NB1, NB2]

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Southwest, Great Plains, Texas, Northeast, Southeast).

* *Eutrixia* sp. NB1 (Fig. 25), CNC1966152♀

* *Eutrixia* sp. NB2, CNC1967137♀

Note: These were compared to the holotype of the western species, *Eutrixia laxifrons* Reinhard, and are different. One of these species is likely *Eutrixia exilis*, but I do not know which one. The other would be an undescribed species. There is a lot of variation among CNC specimens under *E. exilis* and there are probably multiple species in North America.

Freraeini

13. *Freraea montana* (Coquillett)

Distribution. Nearctic: Canada (NWT, B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

Oestrophasiini

14. *Oestrophasia calva* Coquillett

Distribution. Nearctic: Canada (Prairies, Maritimes), USA (California, Northern Rockies, Southwest, Texas, Northeast, Southeast, Florida). Neotropical: Middle America (Mexico).

Uramyini

15.* *Uramya limacodis* (Townsend), CNC1966672♂, CNC1966676♂, CNC1966694♂.

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northeast, Southeast).

Note: There is variation in the hairs on the underside of abdominal T2 (long yellow hairs among short darker hairs vs. only short darker hairs) but barcodes indicate one species. Probably the best distinguishing feature for separating *U. limacodis* and *U. pristis* (Walker) is the colour of the hairs on the anepisternum: dark in former and pale in the latter (see Gates et al. 2012: 44, Figs. 12, 13).

Voriini

16.* *Athyrcia cinerea* (Coquillett), CNC1966147♀.

Distribution. Nearctic: Canada (all), USA (Northern Rockies, Southwest, Great Plains, Texas, Northeast). Neotropical: Middle America (Mexico).

17. *Blepharomyia tibialis* (Curran)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Alaska, Northeast, Southeast).

18. *Campylocheta nasellensis* (Reinhard)

Distribution. Nearctic: Canada (B.C., Ontario, Maritimes), USA (Pacific Northwest).

19. *Campylocheta orbitalis* (Webber)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Northeast).

20. *Campylocheta semiothisae* (Brooks) complex

Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes), USA (Great Plains, Northeast).

* *Campylocheta* sp. NB1, CNC1965996♀, CNC1966154♀, CNC1966637♂.

* *Campylocheta* sp. NB2, CNC1967068♂.

* *Campylocheta* sp. NB3, CNC1965995♀, CNC1966411♀.

Note: *Campylocheta* Rondani is a cosmopolitan genus of 48 species (O'Hara et al. 2020) with 11 named species in the Nearctic Region (O'Hara & Wood 2004: 18). Despite the key to Nearctic species published by Sabrosky (1975), I have found specimens of this genus nearly impossible to identify. I have little confidence that identified specimens in collections are correctly determined based on the general incongruence between DNA barcoding results and identified specimens in the CNC.

21. *Cyrtophloeba coquilletti* Aldrich

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Northeast, Southeast).

22. *Cyrtophloeba nitida* Curran

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, Southwest, Northeast, Southeast).

23. *Hypovoria discalis* (Brooks)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Maritimes), USA (California, Northern Rockies, Southwest, Northeast).

24. *Metaplagia brevicornis* Brooks

Distribution. Nearctic: Canada (Prairies, Ontario, Maritimes, Newfoundland), USA (Northeast).

25.* *Periscepsia (Ramonda) clesides* (Walker) complex, CNC1965988♂, CNC1966111♂, CNC1966682♀.

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Alaska, Pacific Northwest, Southwest, Great Plains, Northeast).

Note: The DNA barcodes for New Brunswick *P. clesides* belong to a single BIN, but other CNC specimens from eastern Canada identified as *P. clesides* belong to two slightly differentiated clades with different BINs. Specimens look very similar, with perhaps one form slightly more yellowish on the head than the other. I suspect "*P. clesides*" *sensu* CNC specimens is a species complex based on these differences in morphology and barcodes.

26.* *Periscepsia (Ramonda) helymus* (Walker), CNC1966252♀, CNC1967162♀.

Distribution. Nearctic: Canada (all), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

27. *Periscepsia (Ramonda) laevigata* (Wulp)

Distribution. Nearctic: Canada (all), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast). Neotropical: Middle America (Guatemala, Mexico).

28.* *Spathidexia dunningii* (Coquillett), CNC1966266♂.

Distribution. Nearctic: Canada (Yukon, Prairies, Ontario, Québec, Maritimes), USA (all mainland except Alaska). Neotropical: Greater Antilles (Jamaica, Puerto Rico).

29. *Spathidexia reinhardi* Arnaud

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: southern Lesser Antilles (Trinidad & Tobago).

* *Spathidexia* sp. NB1, CNC1966108♀.

Note: This is possibly a described species but not *S. dunningii* or *S. clemonsi* Townsend based on its unique DNA barcode.

30.* *Thelaira americana* Brooks, CNC1966720♂.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (all mainland except Alaska). Neotropical: Middle America (Mexico).

31. *Trochilodes leonardi* (West)

Distribution. Nearctic: Canada (Québec, Maritimes), USA (Northeast).

32. *Voria aurifrons* (Townsend)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Great Plains, Northeast).

33. *Voria ruralis* (Fallén)

Distribution. Nearctic: Canada (all), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast). Widespread throughout the world but likely a species complex, including in Nearctic Region.

34. *Wagneria cornuta* Curran

Distribution. Nearctic: Canada (Ontario, Maritimes), USA (Northeast).

35. *Wagneria pacata* Reinhard

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Maritimes), USA (California, Southwest, Great Plains, Northeast).

36. *Wagneria vernata* West

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast, Florida).

EXORISTINAE

Acemyini

37. *Ceracia dentata* (Coquillett)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (all mainland except Alaska). Neotropical: Middle America (Mexico), South America (Chile).

Blondeliini

38.* *Admontia degeerioides* (Coquillett), CNC1966334♂, CNC1966331♀, CNC1966400♀.

Distribution. Nearctic: Canada (all), USA (California, Southwest, Great Plains, Northeast, Southeast).

39. *Admontia pergandei* Coquillett

Distribution. Nearctic: Canada (B.C., Maritimes), USA (Pacific Northwest, Northeast, Southeast).

* *Admontia* sp. NB1, CNC1966040♀.

Note: The DNA barcode matches those of some unidentified *Admontia* specimens from Ottawa (e.g., CNC1707494) and Dayton, Ohio (CNC852617).

40.* *Belida chaetoneura* (Coquillett), CNC1966689♂, CNC1966691♂.

Distribution. Nearctic: Canada (all), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Northeast, Southeast).

41.* *Blondelia eufitchiae* (Townsend), CNC1966319♂.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast).

42.* *Compsilura concinnata* (Meigen), CNC1967087♀, CNC1967088♀.

Distribution. Nearctic (introduced): Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Great Plains, Northeast). Widespread in Old World.

43. *Cryptomeigenia demylus* (Walker)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northeast, Southeast).

Note: There are 14 named species of *Cryptomeigenia* B. & B. in the Nearctic Region (O'Hara & Wood 2004: 83). DNA barcodes differ only slightly among sampled species. Female ovipositors differ considerably among species, from unmodified to triangular to slender and elongate, but within these types some species are difficult to separate.

44.* *Cryptomeigenia hinei* (Coquillett) complex, CNC1967073♀.

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northeast).

Note: Female has unmodified ovipositor.

45.* *Cryptomeigenia theutis* (Walker) complex, CNC1965983♀, CNC1967086♀.

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Texas, Northeast, Southeast).

Note: Female has triangular and bluntly pointed ovipositor.

46. *Cryptomeigenia triangularis* Curran

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Northeast).

47. *Dolichotarsus livescens* Reinhard

Distribution. Nearctic: Canada (Québec, Maritimes), USA (Southwest). Neotropical: Middle America (Mexico).

48. *Eribella exilis* (Coquillett)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Northeast, Southeast).

49. *Eucelatoria borealis* Burington

Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes), USA (Northeast).

50. *Euthelyconychia vexans* (Curran)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Northeast).

51.* *Euthelyconychia xygota* (Curran), CNC1966730♂, CNC1966731♂, CNC1966750♀, CNC1966781♀, CNC1967205♀.

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Texas, Northeast, Southeast).

52. *Lixophaga discalis* (Coquillett)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes), USA (Southwest, Great Plains, Northeast, Southeast).

53. *Lixophaga opaca* Reinhard

Distribution. Nearctic: Canada (Prairies Québec, Maritimes), USA (Pacific Northwest, Northern Rockies, Northeast).

54. *Lixophaga unicolor* (Smith)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Pacific Northwest, Northern Rockies, Southwest Northeast).

55. *Lixophaga variabilis* (Coquillett)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Great Plains, Texas, Northeast, Southeast, Florida).

*** *Lixophaga* sp. NB1, CNC1966045♂, CNC1966054♂, CNC1966257♂, CNC1966782♀, CNC1966811♂.**

Note: There are 16 named species of *Lixophaga* Townsend in the Nearctic Region (O'Hara & Wood 2004: 92) and few can be reliably identified. Wood (1985: 53) wrote: "One of the 3 largest genera of Blondeliini in the New World, *Lixophaga* is also the most uniform, and the most difficult to characterize, especially on external features". The DNA barcodes for *Lixophaga* sp. NB1 do not match those of any of the other 15 or so Nearctic species of *Lixophaga* I have had barcoded.

*** *Lixophaga* sp. NB2, CNC1966057♂, CNC1966677♂, CNC1967136♀.**

Note: The DNA barcodes match those of an unidentified species of *Lixophaga* from Ottawa (e.g., CNC1711835).

*** *Lixophaga* sp. NB3, CNC1966675♂.**

Note: This single male barcodes as sister to *Lixophaga* NB2 but the abdomen is entirely pruinose with a brownish tinge on posterior tergites whereas in NB2 the abdomen has a dark median vitta.

56.* *Medina spinosa* (Coquillett), CNC1966639♂. **New record for Canada and Maritimes.**

Distribution. Nearctic: Canada (Maritimes), USA (Northeast).

Note: There is no separation of Nearctic *Medina* species in their DNA barcodes, but morphologically there are distinct differences that suggest the presence of several species. *Medina spinosa* is recognized here based the male features of dark upper and lower calypters and tuft of setae extending along length of the lateral arm of abdominal sternite 5 (both mentioned in unpublished notes of D.M. Wood on holotype from the White Mountains of New Hampshire, USA).

*** *Medina* sp. NB1, CNC1966761♀**

Note: Two females with underside of abdomen covered with a dense mat of short spines unlike those of a described species.

Medina sp., three unassociated females, two barcoded, CNC1966107, CNC1966754.

Note: These three females do not have the short stout spines on the underside of the abdominal tergites as is usual for *Medina spinosa*. They are not counted here as an additional species (hence no red asterisk).

57.* *Myiopharus aberrans* (Townsend), CNC1966216♀. **New record for Maritimes.**

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Northern Rockies, Great Plains, Northeast, Southeast, Florida).

58. *Myiopharus doryphorae* (Riley)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: Middle America (Mexico).

59.* *Oswaldia albifacies* (Townsend), CNC1966249♂, CNC1966109♂.

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northeast).

Note: The identity of *O. albifacies* is here based on a CNC male (CNC751516) that has been DNA barcoded and bears a D.M. Wood label that reads: "Ht of *albifacies* in USNM is this species".

60.* *Oswaldia assimilis* (Townsend), CNC1966756♀, CNC1966785♂, CNC1966812♂.

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast).

* *Oswaldia* sp. NB1, CNC1966629♂, CNC1966684♂, CNC1966726♂, CNC1966757♀, CNC1990885♂, CNC1990886♂.

Note: This is similar to *O. albifacies* but has a slightly less pruinose (more shiny) abdomen. The DNA barcodes match those of some unidentified *Oswaldia* specimens from Ottawa (CNC1711883) and Berks County, Pennsylvania (e.g., CNC751518).

* *Oswaldia* sp. NB2, CNC1966780♀.

Note: The DNA barcode matches that of a single unidentified *Oswaldia* specimen from Ottawa (CNC1712032).

* *Oswaldia* sp. NB3, CNC1966253♂.

Note: The DNA barcode matches that of a single unidentified *Oswaldia* specimen from Ottawa (CNC557451).

61.* *Paracraspedothrix angulicornis* (Curran), CNC1966406♀.

Distribution. Nearctic: Canada (Yukon, B.C., Ontario, Québec, Maritimes), USA (Alaska, Northeast, Southeast).

Note: The DNA barcode matches that of a specimen of *Paracraspedothrix montivaga* Villeneuve from Switzerland (CNC1547011). The possible synonymy of these names should be investigated.

62.* *Phyllophilopsis nitens* (Coquillett), CNC1966734♂.

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Northeast, Southeast).

63. *Picconia derisa* (Reinhard)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Northeast).

64. *Vibrissina aurifrons* (Curran)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Northeast).

65. *Zaira calosomae* (Townsend)

Distribution. Nearctic: Canada (B.C., Maritimes), USA (Southwest, Northeast).

Eryciini

66.* *Aplomya theclarum* (Scudder), CNC1966733♂.

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: Middle

America (Mexico).

Note: DNA barcodes suggest there are two species under the name *A. theclarum* from Missouri westward.

67. *Carcelia (Carcelia) amplexa* (Coquillett)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast, Florida).

68. *Carcelia (Carcelia) laxifrons* Villeneuve

Distribution. Nearctic (introduced): Canada (Ontario, Québec, Maritimes), USA (Northeast). Widespread in Palaearctic Region and Oriental China.

69. *Carcelia (Carcelia) olenensis* Sellers

Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes, Newfoundland), USA (California, Northeast, Southeast).

70. *Carcelia (Carcelia) protuberans* (Aldrich & Webber)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Southwest, Texas, Northeast, Southeast).

71. *Carcelia (Carcelia) reclinata* (Aldrich & Webber)

Distribution. Nearctic: Canada (all), USA (all mainland except Alaska). Neotropical: Middle America (Mexico), South America (Colombia).

72. *Carcelia (Carcelia) tenuiforceps* (Reinhard)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Northeast).

73. *Drino (Drino) incompta* (Wulp)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (California, Southwest, Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: Middle America (Mexico).

74. *Drino (Drino) rhoeo* (Walker)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: Greater Antilles (Jamaica), eastern Lesser Antilles (Dominica), Middle America (Costa Rica, Mexico), South America (Argentina).

* *Drino (Drino)* sp. NB1, CNC1965978♂, CNC1966494♀.

Note: The two DNA barcodes do not match those of any other CNC specimens. This is a dark species similar to *D. bakeri* but has a completely pruinose abdominal tergite 5 (tip black in *D. bakeri*), broader parafacial and darker palpus.

75. *Drino (Palexorista) bohémica* Mesnil

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes, Newfoundland), USA (Northeast). Palaearctic: Europe, Transcaucasia, Russia, Japan. Oriental: China.

76.* *Hubneria estigmenensis* (Sellers), CNC1966456♂, CNC1966244♂.

Distribution. Nearctic: Canada (all), USA (Alaska, California, Northern Rockies, Southwest, Great Plains, Northeast).

Note: The DNA barcodes match that of a specimen of *Hubneria affinis* (Fallén) from the Czech Republic (CNC602748). The possible synonymy of these names should be investigated.

77. *Lespesia frenchii* (Williston)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (all mainland except Alaska).

78. *Lespesia melalophae* (Allen)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: Middle America (Mexico).

79. *Lespesia samiae* (Webber)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

80.* *Lydella radialis* (Townsend), CNC1966153♀.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: Middle America (Mexico).

81.* *Lydella thompsoni* Herting, CNC1966148♂, CNC1966393♀. **New record for Maritimes.**

Distribution. Nearctic (introduced): Canada (Prairies, Ontario, Québec, Maritimes). USA (Great Plains, Northeast, Southeast). Palaearctic: Central Asia, Europe, Japan, Middle East, Mongolia, Russia, Transcaucasia. Oceanian: Guam.

Note: This is tentatively identified as *L. thompsoni* because the DNA barcodes do not match those of *Lydella radialis*, and New Brunswick is within the range of the introduced *L. thompsoni*. These species are very similar morphologically.

82. *Madremyia saundersii* (Williston)

Distribution. Nearctic: Canada (all), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast). Neotropical: Middle America (Mexico).

83. *Nilea carpocapsae* (Townsend)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Southeast).

84. *Nilea erecta* (Coquillett)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (all mainland except Alaska).

85.* *Nilea mathesoni* (Reinhard), CNC1966143♀, CNC1967083♀. **New record for Maritimes.**

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Florida, Northeast).

86. *Nilea sternalis* (Coquillett)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

* *Nilea* sp. NB1, CNC1966100♂.

Note: This is a distinct species with no DNA barcode match. It is difficult to key to *Nilea* in Wood (1987) because it does not have a densely haired eye (couplet 17) or stout erect supravibrissal setae (couplet 42), but does have “katapisternum with posteroventral bristle arising nearly in line with anterior and posterior bristles and nearly equidistant between the two; only the anteroventral bristle displaced ventrally” (couplet 43, p. 1210).

87.* *Phebellia cerurae* (Sellers), CNC1966397♀. **New record for Maritimes.**

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Southwest, Northeast).

88. *Phebellia crassiseta* (Aldrich & Webber)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast).

89. *Phebellia curriei* (Coquillett)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Texas, Northeast).

90. *Phebellia helvina* (Coquillett)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, Southwest, Great Plains, Northeast).

91. *Phebellia nigripalpis* (Robineau-Desvoidy)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northeast). Palaearctic: widespread.

92.* *Phryxe pecosensis* (Townsend), CNC1965986♀.

Distribution. Nearctic: Canada (all), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

93. *Phryxe vulgaris* (Fallén)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Northeast). Widespread in Palaearctic Region and Oriental China.

Euthelairini

94. *Neomintho celeris* (Townsend)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast, Florida).

Exoristini

* *Austrophorocera* sp. NB1, CNC1966321♀.

Note: Neither DNA barcodes or Wood’s (1987) key clearly separates *Austrophorocera* Townsend from *Chetogena* Rondani. The single female is a better match for the former because “lower margin of face not protruding, not visible in profile” and “wing membrane flat at bend of M, not appearing as a continuation of M” (couplet 109, Wood 1987: 1221). However, the DNA barcode matches that of a specimen from Pinal County, Arizona that was identified as *Chetogena* sp. (CNC852651).

95. *Bessa harveyi* (Townsend)

Distribution. Nearctic: Canada (all), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

96. *Chetogena (Chetogena) vibrissata* (Brauer & Bergenstamm)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Southwest, Northeast).

97. *Chetogena (Diplostichus) lophyri* (Townsend)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast, Florida).

98.* *Exorista (Adenia) dydas* (Walker), CNC1966140♂, CNC1966264♀.

Distribution. Nearctic: Canada (all), USA (Alaska, all mainland except Alaska).

99. *Exorista (Exorista) mella* (Walker)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes), USA (all mainland except Alaska).

100.* *Parasetigena silvestris* (Robineau-Desvoidy), CNC1966395♀. **New record for Maritimes.**

Distribution. Nearctic (introduced): Canada (Ontario, Québec, Maritimes), USA (Northeast). Palaearctic: widespread.

101. *Phorocera (Pseudotachinomyia) webberi* (Smith)

Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes), USA (Northern Rockies, Great Plains, Texas, Northeast, Southeast).

102. *Tachinomyia acosta* Webber

Distribution. Nearctic: Canada (B.C., Ontario, Maritimes), USA (Pacific Northwest, California, Northeast, Southeast).

103.* *Tachinomyia apicata* Curran, CNC1966037♀.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast).

104. *Tachinomyia nigricans* Webber

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast).

105. *Tachinomyia panaetius* (Walker)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Great Plains, Northeast).

106. *Tachinomyia variata* Curran

Distribution. Nearctic: Canada (B.C., Prairies, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Florida). Neotropical: Middle America (Mexico).

Goniini

107. *Belvosia borealis* Aldrich

Distribution. Nearctic: Canada (Ontario, Maritimes), USA (California, Southwest, Great Plains, Texas, Northeast, Southeast, Florida).

108. *Ceromasia auricaudata* Townsend

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

109. *Cyzenis albicans* (Fallén)

Distribution. Nearctic (introduced): Canada (B.C., Maritimes), USA (Pacific Northwest, Northeast). Palearctic: widespread.

110. *Cyzenis pullula* (Townsend)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Alaska, Pacific Northwest, Northern Rockies, Southwest, Northeast).

111. *Cyzenis ustulata* (Reinhard)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Southwest, Northeast, Southeast).

112. *Erynnia tortricis* (Coquillett)

Distribution. Nearctic: Canada (all), USA (all mainland except Alaska).

113.* *Euexorista rebaptizata* Gosseries, CNC1966399♂, CNC1966317♀.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

114. *Eumea caesar* (Aldrich)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast).

115. *Frontiniella mitis* (Curran)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Northeast).

116. *Gonia aldrichi* Tothill

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Northern Rockies, Southwest, Great Plains, Northeast).

117. *Gonia brevipulvilli* Tothill

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

118. *Gonia chilonis* Walker

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Southwest).

119. *Gonia distincta* Smith

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Southwest, Northeast, Southeast).

120. *Gonia frontosa* Say

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

121. *Gonia smithi* Brooks

Distribution. Nearctic: Canada (Prairies, Ontario, Maritimes), USA (Northeast).

122. *Houghia sternalis* (Coquillett)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast).

123. *Hyphantrophaga blanda* (Osten Sacken)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Southwest, Great Plains, Texas, Northeast, Southeast,

Florida). Neotropical: Middle America (Costa Rica).

124. *Hyphantrophaga virilis* (Aldrich & Webber)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: Middle America (Costa Rica, Mexico).

125. *Leschenaultia exul* (Townsend)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northeast, Southeast).

126. *Myxexoristops fronto* (Coquillett)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (California, Northern Rockies, Southwest, Northeast).

127. *Onychogonia flaviceps* (Zetterstedt)

Distribution. Nearctic: Canada (all), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest). Palearctic: Europe, Japan, Mongolia, Russia.

128. *Patelloa leucaniae* (Coquillett)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Texas, Northeast, Southeast, Florida).

129. *Patelloa pachypyga* (Aldrich & Webber)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Great Plains, Northeast).

130.* *Platymya confusionis* (Sellers), CNC1966117♂, CNC1966512♀.

Distribution. Nearctic: Canada (all), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

131.* *Pseudochaeta (Pseudochaeta) siminina* Reinhard, CNC1966248♂.

Distribution. Nearctic: Canada (Ontario, East), USA (Great Plains, Texas, Northeast, Southeast).

132. *Spallanzania hesperidarum* (Williston)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Southwest, Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: Middle America (Mexico).

Winthemini

133. *Nemorilla pyste* (Walker)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (all mainland except Alaska). Neotropical: eastern Lesser Antilles (Virgin Islands), southern Lesser Antilles (Trinidad & Tobago), Middle America (Mexico).

134. *Smidtia fumiferanae* (Tothill)

Distribution. Nearctic: Canada (all), USA (Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast).

135. *Winthemia borealis* Reinhard

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, Northeast).

136. *Winthemia datanae* (Townsend)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (all mainland except Alaska). Neotropical: Middle America (Mexico).

137.* *Winthemia occidentis* Reinhard, CNC1966719♂, CNC1966727♂.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Northern Rockies, Southwest, Great Plains, Northeast). Neotropical: Middle America (Mexico).

138. *Winthemia quadripustulata* (Fabricius)

Distribution. Nearctic: Canada (all), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast). Widespread in Palearctic Region and Oriental China.

139.* *Winthemia rufopicta* (Bigot), CNC1966267♀.
Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (all mainland except Alaska). Neotropical: Middle America (Panama).

140. *Winthemia sinuata* Reinhard
Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Northern Rockies, Great Plains, Texas, Northeast, Southeast, Florida).

141. *Winthemia vesiculata* (Townsend)
Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northeast).

* *Winthemia* sp. NB1 (Fig. 27), CNC1966141♀, CNC1966620♂, CNC1966646♂, CNC1966680♂.
Note: This species is easily confused with *Winthemia datanae* (Townsend) but the two can be easily separated by their DNA barcodes. Hilltopping males were common on Chamcook Mtn.

* *Winthemia* sp. NB2, CNC1966621♂.
Note: The DNA barcode matches those of some unidentified *Winthemia* specimens from Ottawa (e.g., CNC557323♀) and, Mt. Rigaud Québec (e.g., CNC751725). This species is morphologically similar to *W. quadripustulata* (Fabricius) but the two species have distinct DNA barcodes. It is possibly conspecific with *Winthemia illinoensis* Robertson, a name currently in synonymy with *W. quadripustulata* but perhaps a different species. Males were hilltopping on Chamcook Mtn.

* *Winthemia* sp. NB3, three females, not yet barcoded (CNC1966145, CNC1966251, CNC1967134).
Note: These have a completely black infuscated abdomen (i.e., no red). They are different from the other four collected species but have not been identified.

PHASIINAE

Catharosiini

142. *Catharosia lustrans* (Reinhard)
Distribution. Nearctic: Canada (B.C., Québec, Maritimes), USA (California, Great Plains, Northeast).

Cylindromyiini

143.* *Cylindromyia* (*Cylindromyia*) *euchenor* (Walker), CNC1965396♀, CNC1966976♂.
Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (California, Southwest, Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: Middle America (Mexico).

144.* *Cylindromyia* (Neocyptera) *interrupta* (Meigen), CNC1965992♂, CNC1966042♂, CNC1966810♂.
Distribution. Nearctic: Canada (Yukon, B.C., Ontario, Québec, Maritimes), USA (California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast, Florida). Palaearctic: Europe, Transcaucasia, Russia, China.

145.* *Hemyda aurata* Robineau-Desvoidy, CNC1966746♀. **New record for Maritimes.**
Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: Middle America (Mexico).

Note: O'Hara & Wood (2004: 219) recorded the Canadian distribution of *H. aurata* as "British Columbia to New Hampshire" and cited Manitoba as the type locality of a synonym, but did not specifically mention any eastern provinces. The CNC has specimens from Ontario and Québec and it is here recorded for the first time from the Maritimes.

Gymnosomatini

146.* *Euclytia flava* (Townsend), CNC1966142♂.
Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes,

Labrador), USA (California, Southwest, Great Plains, Texas, Northeast, Southeast, Florida).

147. *Gymnoclytia dubia* (West)
Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (?California, Texas, Northeast).

148.* *Gymnoclytia occidua* (Walker), CNC1965982♀, CNC1966250♂.
Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: Middle America (Mexico).

149. *Gymnosoma canadense* (Brooks)
Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Southwest, Northeast, Southeast).

150.* *Gymnosoma par* Walker, CNC1967165♀.
Distribution. Nearctic: Canada (Yukon, Prairies, Ontario, Québec, Maritimes), USA (Northern Rockies, Great Plains, Northeast, Southeast).

151. *Xanthomelanodes arcuatus* (Say)
Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Southwest, Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: Middle America (Mexico).

Leucostomatini

152. *Leucostoma simplex* (Fallén)
Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast). Neotropical: South America (Argentina, Chile). Widespread in Old World except for Oriental Region.

Phasiini

153. *Phasia aurulans* Meigen
Distribution. Nearctic: Canada (NWT, B.C., Prairies, Ontario, Québec, Maritimes), USA (Alaska, Pacific Northwest, Northeast, Southeast). Palaearctic: Europe, Japan, Kazakhstan, Korean Peninsula, Russia.

154. *Phasia diversa* (Coquillett)
Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Pacific Northwest, Great Plains, Texas, Northeast, Southeast).

155.* *Phasia robertsonii* (Townsend), CNC1966049♀, CNC1966337♀.
Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast, Florida).
Note: This is the eastern equivalent of *Phasia aeneoventris* (Williston), and the possible synonymy of these names should be investigated. There is a great deal of intraspecific morphological variability in both of these but no differences in their DNA barcodes.

Strongygastrini

156. *Strongygaster robusta* (Townsend)
Distribution. Nearctic: Canada (B.C., Ontario, Maritimes), USA (Pacific Northwest, Northern Rockies, Southwest, Northeast, Southeast).

157.* *Strongygaster triangulifera* (Loew), CNC1966051♂, CNC1966336♂.
Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: eastern Lesser Antilles (Dominica), Middle America (Mexico), South America (Argentina, Brazil, Chile).

TACHININAE

Bigonichetini

158.* *Triarthria setipennis* (Fallén) (Fig. 26), CNC1966496♀. **New record for Maritimes.**
Distribution. Nearctic (introduced): Canada (B.C., Ontario, Maritimes, Newfoundland), USA (Pacific Northwest, California, Northern Rockies, Southwest, Northeast). Palaearctic: Europe, Transcaucasia, Middle East, Russia.

Brachymerini

159. *Pseudopachystylum debile* (Townsend)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast).

Ernestiini

160. *Gymnocheta vivida* Williston

Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Northeast, Southeast).

161. *Linnaemya (Linnaemya) comta* (Fallén)

Distribution. Nearctic: Canada (all), USA (all). Neotropical: Middle America (Honduras, Mexico), South America (Chile, Peru). Widespread in Palaearctic Region and Oriental China.

162.* *Linnaemya (Ophina) glauca* (Brooks), CNC1966589♂.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, Northern Rockies, Southwest, Great Plains, Northeast).

163. *Linnaemya (Ophina) nigrescens* Curran

Distribution. Nearctic: Canada (all).

164. *Linnaemya (Ophina) tessellata* (Brooks)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

* *Linnaemya* sp. NB1, CNC1966035♂, CNC1966590♂.

Note: The DNA barcode is in a group with various names, likely the result of multiple misidentifications. *Linnaemya* is a taxonomically difficult genus and identifying specimens is problematic.

165. *Panzeria ampelus* (Walker)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

166. *Panzeria bicarina* (Tothill)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Maritimes, Labrador), USA (Northern Rockies, Southwest, Great Plains).

167. *Panzeria fasciventris* (Curran)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Southwest, Great Plains, Northeast).

168. *Panzeria flavicornis* Brauer

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast).

169. *Panzeria frontalis* (Tothill)

Distribution. Nearctic: Canada (all), USA (Alaska, Northern Rockies, Southwest, Northeast).

170. *Panzeria nigropalpis* (Tothill)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northeast, Southeast).

171. *Panzeria platycarina* (Tothill)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Pacific Northwest, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

Graphogastrini

172. *Graphogaster macdunnoughi* (Brooks)

Distribution. Nearctic: Canada (NWT, Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Northeast).

173. *Graphogaster psilocorsiphaga* (Brooks)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Alaska, Northeast).

174. *Graphogaster slossonae* (Townsend)

Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes, Newfoundland), USA (Pacific Northwest, Northeast).

* *Graphogaster* sp. NB1, CNC1966269♀, CNC1966591♀.

Note: *Graphogaster Rondani* is a difficult genus and most specimens cannot be reliably identified. The DNA barcodes for this species match those of some unidentified *Graphogaster* specimens from Ottawa (e.g., CNC708018).

* *Graphogaster* sp. NB2, CNC1966318♂.

Note: The DNA barcode matches that of an unidentified *Graphogaster* specimen from Ottawa (CNC566045).

175. *Phytomyptera aenea* (Coquillett)

Distribution. Nearctic: Canada (Yukon, Prairies, Ontario, Québec, Maritimes), USA (California, Southwest). Neotropical: Middle America (Mexico).

176. *Phytomyptera nigra* (Brooks)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Northeast, Southeast).

177.* *Phytomyptera palpigera* (Coquillett), CNC1966156♀, CNC1967119♀.

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast, Southeast).

178. *Phytomyptera vitinervis* (Thompson)

Distribution. Nearctic: Canada (NWT, B.C., Prairies, Ontario, Québec, Maritimes, Labrador), USA (Southwest, Great Plains, Texas, Northeast, Southeast, Florida).

* *Phytomyptera* sp. NB1, CNC1965993♀, CNC1967095♀.

Note: The DNA barcodes match those of unidentified *Phytomyptera* specimens from Ottawa (e.g., CNC1710067).

Leskiini

179. *Aphria ocypterata* Townsend

Distribution. Nearctic: Canada (Yukon, B.C., Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

180. *Clausicella politura* (Reinhard)

Distribution. Nearctic: Canada (NWT, Ontario, Québec, Maritimes), USA (Great Plains, Northeast).

181.* *Clausicella turmalis* (Reinhard), CNC1965984♀, CNC1966146♀.

New record for Maritimes.

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (?California, Great Plains, Texas, Northeast, Southeast).

182.* *Genea (Genea) tenera* (Wiedemann), CNC1967138♂.

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: Greater Antilles (Jamaica), South America (Guyana).

183.* *Genea (Genea) texensis* (Townsend) complex, CNC1967111♀, CNC1967135♂.

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Texas, Northeast, Southeast, Florida).

Note: DNA barcoding of CNC specimens divides “*G. texensis*” into three well-differentiated BINS with the two barcodes here belonging to different BINS.

184. *Leskia depilis* (Coquillett)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Northeast, Southeast, Florida).

Megaprosopini

185. *Microphthalma michiganensis* (Townsend)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Southwest, Great Plains, Texas, Northeast).

Neaerini

186. *Neaera leucoptera* (Johnson)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Southwest, Great Plains, Northeast).

Nemoraeni

187. *Xanthophyto* “*antennalis*” (Townsend)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Southwest, Northeast, Southeast). Neotropical: Middle America (Mexico).

Note: *Xanthophyto* Townsend is being revised by John Stireman. The identities and distributions of the two named Nearctic species are under review and new species will be described.

Polideini

188.* *Chrysotachina infrequens* O’Hara (Fig. 28), CNC1966261♂, CNC1966401♂. **New record for Canada and Maritimes.**

Distribution. Nearctic: Canada (Maritimes). USA (Northern Rockies, Northeast, Southeast).

189. *Chrysotachina slossonae* (Coquillett)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Northeast, Southeast, Florida).

190. *Homalactia harringtoni* (Coquillett)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast).

191.* *Hystriicia abrupta* (Wiedemann), CNC1966243♂, CNC1966776♂.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast). Neotropical: Middle America (Mexico).

192. *Lydina americana* (Townsend)

Distribution. Nearctic: Canada (NWT, B.C., Prairies, Ontario, Québec, Maritimes), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

* *Lydina* sp. NB1, CNC1966786♀.

Note: Specimens of *Lydina* Rob.-Des. can be difficult to identify, especially females. This single female cannot be identified morphologically but its DNA barcode is interesting: it is in a BIN of its own among barcoded CNC specimens, not matching either of the named Nearctic species (*L. americana* and *L. areos* (Walker)) or the common species in Europe, *L. aenea* (Meigen).

193. *Lypha frontalis* Brooks

Distribution. Nearctic: Canada (Ontario, Maritimes), USA (Great Plains, Northeast).

194. *Lypha fumipennis* Brooks

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Northern Rockies, Great Plains, Northeast, Southeast).

195. *Lypha parva* Brooks

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Great Plains).

196. *Micronychia maculipennis* (Aldrich)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Québec, Maritimes, Newfoundland), USA (Alaska, Pacific Northwest, Northeast).

Siphonini

197. *Actia autumnalis* (Townsend)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Southwest, Great Plains, Northeast, Southeast).

198.* *Actia diffidens* Curran, CNC1966499♀, CNC1966508♀, CNC1967097♂, CNC1967187♀.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes,

Newfoundland), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Texas, Northeast, Southeast). Neotropical: Middle America (Mexico).

199.* *Actia dimorpha* O’Hara, CNC1966501♀, CNC1966507♂, CNC1966800♀, CNC1967185♀. **New record for Maritimes.**

Distribution. Nearctic: Canada (Ontario, Maritimes), USA (Northeast, Southeast, Florida).

200.* *Actia interrupta* Curran, CNC1966052♀, CNC1966262♀, CNC1967184♀.

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Northeast, Southeast).

201. *Ceromya americana* (Townsend)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (California, Southwest, Great Plains, Texas, Northeast, Southeast, Florida).

202. *Ceromya balli* O’Hara

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Great Plains, Northeast).

203.* *Ceromya bicolor* (Meigen), CNC1966263♂.

Distribution. Nearctic: Canada (all), USA (Southwest, Great Plains, Northeast). Palaearctic: Europe, Transcaucasia, Russia, Korean Peninsula, China.

204.* *Ceromya oriens* O’Hara, CNC1967140♀.

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Northeast, Southeast).

205. *Ceromya palloris* (Coquillett)

Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes), USA (Northeast).

206.* *Siphona (Ceranthia) flavipes* (Coquillett), CNC1966332♀.

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Northeast).

207. *Siphona (Siphona) cristata* (Fabricius)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Southwest). Widespread in Palaearctic Region and Oriental China, Taiwan.

208.* *Siphona (Siphona) geniculata* (De Geer) (Fig. 29), CNC1965997♂, CNC1966282♂, CNC1966288♂, CNC1966352♂, CNC1966418♀, CNC1966531♀, CNC1966572♂, CNC1966802♂, CNC1967152♂. **New record for eastern Canada and Maritimes.**

Distribution. Nearctic (introduced): Canada (B.C., Maritimes). USA (Pacific Northwest). Widespread in Palaearctic Region, also Taiwan in Oriental Region.

Note: *Siphona geniculata* was introduced into southwestern British Columbia and became established there. It was also released in Newfoundland but there has been no report of establishment. It was by far the most common species collected during this survey (284 specimens) and accounted for nearly 40% of all specimens.

I can also report here the first record of *S. geniculata* from the United States based on examined and DNA barcoded specimens in the CNC (from Washington state, Lewis County, Chehalis; e.g., CNC DIPTERA 162329).

New record for United States (Pacific Northwest).

209.* *Siphona (Siphona) hokkaidensis* Mesnil, CNC1966233♂, CNC1966749♂, CNC1966774♂, CNC1967074♀, CNC1967155♂, CNC1967172♀, CNC1967177♂.

Distribution. Nearctic: Canada (all), USA (Alaska, Pacific Northwest, Northeast). Palaearctic: Europe, Japan, Russia.

210.* *Siphona (Siphona) intrudens* (Curran), CNC1967077♀.

Distribution. Nearctic: Canada (NWT, B.C., Prairies, Ontario, Québec, Maritimes), USA (Alaska, Pacific Northwest, California, Great Plains, Texas, Northeast, Southeast).

211.* *Siphona (Siphona) maculata* Staeger, CNC1967098♀, CNC1967130♀. **New record for Maritimes.**

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Alaska, Pacific Northwest, Southwest, Great Plains, Northeast). Palaearctic: Europe, Transcaucasia, Russia.

212. *Siphona (Siphona) medialis* O'Hara

Distribution. Nearctic: Canada (B.C., Prairies, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

213. *Siphona (Siphona) multifaria* O'Hara

Distribution. Nearctic: Canada (all), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Northeast, Southeast, Florida).
Note: *Siphona multifaria* is likely a species complex based on DNA barcoding of CNC specimens.

* *Siphona (Siphona)* sp. NB1, CNC1967128♀.

Note: This unidentified female belongs to the *S. (S.) maculata* group and could be an undescribed species. The DNA barcode does not match that of a named eastern Nearctic species but does match an unidentified species on BOLD as a public record from P.E.I.

* *Siphona sensu lato* sp. NB1, CNC1967186♂.

Note: This species belongs to a lineage of *Siphona* that is neither subgenus *Siphona* Meigen (with a long geniculate proboscis) or subgenus *Ceranthia* Rob.-Des. (with reduced palpus). It is almost certainly an undescribed species. Among public records on BOLD it is closest to an unidentified species of *Siphona s.l.* from Guanacaste, Costa Rica.

Tachinini

214. *Archytas (Archytas) apicifer* (Walker)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (all mainland except Alaska). Neotropical: widespread.

215. *Archytas (Archytas) californiae* (Walker)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (all mainland except Alaska). Neotropical: Middle America (Mexico).

216. *Archytas (Nemochaeta) aterrimus* (Robineau-Desvoidy)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (California, Northern Rockies, Southwest, Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: Middle America (Mexico).

* *Archytas (Nemochaeta)* sp. NB1, CNC1966316♂, CNC1966389♂, CNC1966491♂.

Note: This belongs to an unresolved species complex and might be an undescribed species. The DNA barcodes match those of some *Archytas* Jaenicke specimens from Ottawa (e.g., CNC591938).

217.* *Epalpus signifer* (Walker), CNC1966215♀, CNC1967113♀.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (all mainland except Alaska).

218.* *Pararchytas decisus* (Walker), CNC1966315♂.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Texas, Northeast). Neotropical: Middle America (Mexico).

219. *Peleteria (Oxydosphyria) iterans* (Walker)

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast). Neotropical: Middle America (Mexico).

220. *Peleteria (Sphyrimyia) anaxias* (Walker)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (Southwest, Northeast, Southeast).

221.* *Peleteria (Sphyrimyia) haemorrhoea* (Wulp), CNC1965979♂, CNC1967157♂.

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes), USA (California, Southwest, Great Plains, Northeast, Southeast).

222. *Tachina (Nowickia) ampliforceps* (Rowe)

Distribution. Nearctic: Canada (NWT, B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), Greenland, USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

223. *Tachina (Nowickia) dakotensis* (Townsend)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes, Labrador), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast). Neotropical: Middle America (Mexico).

224. *Tachina (Nowickia) garretti* Arnaud

Distribution. Nearctic: Canada (Yukon, B.C., Prairies, Ontario, Québec, Maritimes), USA (Alaska, Pacific Northwest, Northern Rockies, Southwest, Northeast).

225. *Tachina (Nowickia) piceifrons* (Townsend)

Distribution. Nearctic: Canada (NWT, B.C., Prairies, Ontario, Québec, Maritimes), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast, Southeast).

226. *Tachina (Rhachogaster) algens* Wiedemann

Distribution. Nearctic: Canada (all), USA (Alaska, Pacific Northwest, California, Northern Rockies, Southwest, Great Plains, Northeast).

227. *Tachina (Rhachogaster) latianulum* (Tothill)

Distribution. Nearctic: Canada (B.C., Prairies, Ontario, Québec, Maritimes, Newfoundland), USA (Pacific Northwest, California, Northern Rockies, Southwest, Great Plains).

Unplaced genus of Tachininae

228.* *Eulasiona comstocki* Townsend, CNC1966717♂.

Distribution. Nearctic: Canada (B.C., Ontario, Québec, Maritimes), USA (California, Southwest, Great Plains, Northeast, Southeast). Neotropical: Middle America (Mexico).

UNPLACED TRIBES OF TACHINIDAE

Macquartiini

229. *Macquartia erythrocerata* (Reinhard)

Distribution. Nearctic: Canada (Prairies, Ontario, Québec, Maritimes), USA (Southeast).

Myiophasiini

230.* *Cholomyia inaequipis* Bigot, CNC1967160♀. **New record for Maritimes.**

Distribution. Nearctic: Canada (Ontario, Maritimes), USA (Southwest, Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: widespread.

231. *Gnadochaeta metallica* (Townsend)

Distribution. Nearctic: Canada (Maritimes), USA (Great Plains, Texas, Northeast, Southeast, Florida). Neotropical: Middle America (Mexico).

232. *Gnadochaeta nigrifrons* (Townsend)

Distribution. Nearctic: Canada (Ontario, Québec, Maritimes), USA (Great Plains, Texas, Northeast, Southeast). Neotropical: Middle America (Mexico).