Figure 1. Hamburg Trail in Ramsey Canyon, Huachuca Mountains, Arizona, United States. The two species newly recorded from America north of Mexico, *Stomatodexia* sp. and *Calolydella summatis* Reinhard, were found here.

New tachinid records for the United States and Canada

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Introduction

The Tachinid fauna of America north of Mexico was catalogued nearly a decade ago by O'Hara & Wood (2004). This work superseded the long-standing catalogue of Sabrosky & Arnaud (1965) and brought the tachinid classification of the region more in line with that of the Palaearctic Region (Herting 1984; Herting & Dely-Draskovits 1993). Despite this advance in the classification of the tachinids of America north of Mexico, the actual fauna of the region at the species level is not especially well known. Most genera are in need of revision and there are many new species in collections awaiting description. By way of example, I recently reviewed the tachinid fauna of the Gila National Forest in New Mexico (USA) and recognized 241 morphospecies based on nearly 3000 specimens (O'Hara 2012b). I could not match one-third of the morphospecies with described species and concluded most of them represent new species. Not all of America north of Mexico has such a high percentage of undescribed tachinids, but throughout the region there are new species, and even in the northeast where tachinids are better known, the state of knowledge is far behind that of Europe. There, tachinidologists have been more active over the past 200+ years and have described most of the species.

Another aspect of knowing the fauna of America north of Mexico is keeping track of significant changes to recorded distributions of valid genera and species. This is of special interest to me because I maintain a

database of the tachinids of the region. Four of the more noteworthy new records are reported in this article. They consist of two new records for the region and two new records for Canada. One of the former is a genus new to America north of Mexico (i.e., *Stomatodexia*) and this record will be reflected in the next version of *World genera of the Tachinidae (Diptera) and their regional occurrence* (see O'Hara 2012a for the current version).

Acronyms used below: CNC, Canadian National Collection of Insects, Agriculture and Agri-Food Canada, Ottawa, Canada; USNM, National Museum of Natural History [formerly United States National Museum], Smithsonian Institution, Washington, DC, USA.

New genus record for America north of Mexico

Stomatodexia Brauer & Bergenstamm, 1889 (Tachininae, Leskiini)

Fig. 2

Stomatodexia Brauer & Bergenstamm, 1889: 125 [also 1890: 57]. Type species: *Stomoxys cothurnata* Wiedemann, 1830, by monotypy.

Guimarães (1971) listed seven species of *Stomatodexia* ranging from Brazil to Mexico. Of these, three were treated as "unrecognized" (i.e., *nomina dubia*) and another from Jamaica (*S. tinctisquamae* Curran) was earlier excluded from the genus by Townsend (1939) but was not placed elsewhere. Wood & Zumbado (2010) did not record the genus from Costa Rica.

There are specimens in the CNC of a *Stomatodexia* species from Durango (Mexico) and Arizona (United States, Fig. 1). It is treated here as "*Stomatodexia* sp." pending further study of the genus. A revision of the genus, including examination of the types of the nominal species assigned to it (especially the two described from Mexico, *S. maculifera* (Bigot) and *S. similigena* van der Wulp), is needed before the species recorded here from Durango and Arizona can be determined as new or already described.

The CNC specimens of *Stomatodexia* sp. were originally thought to be a species of *Leskia* Robineau-Desvoidy until identified as *Stomatodexia* by Enio Nunez (Brazil) during a visit to the CNC in 2004. This reassignment was too late for *Stomatodexia* to be included in the catalogue by O'Hara & Wood (2004) and then went unnoticed until I caught several specimens of *Stomatodexia* sp. in Arizona in 2013.

There are 18 specimens of *Stomatodexia* sp. in the CNC from several localities in the state of Durango, Mexico. This species is further known from the following specimens from Arizona (all in CNC), and these records form the basis for this new record of *Stomatodexia* from America north of Mexico:

1 male: USA, Arizona, Santa Catalina Mountains, mile 10, Bear Canyon [within Sabino Canyon], 2.vii.1958, F. Werner.

1 male: USA, Arizona, Huachuca Mountains, Ramsey Canyon, 5200' [1585 m], Malaise trap, 24.v.1967, R.F. Sternitzky.

1 male: USA, Arizona, Huachuca Mountains, Ida Canyon, 7000' [2133 m] [probably in error and closer to 6100', 1860 m], 8.viii.1999, J.O. Stireman III.

2 males: USA, Arizona, Huachuca Mountains, Ida Canyon, 31°23.1'N 110°19.6'W, ca. 6100' [1860 m], 8–9.viii.1999, J.E. O'Hara. One of these was photographed for the TachImage Gallery (Tachimages 00499 [Fig. 2], 00500).

2 males: USA, Arizona, Huachuca Mountains, Ramsey Canyon, Hamburg Trail, 31°26.3'N 110°19.2'W, ca. 6300' [1920 m], 11.viii.1999, J.E. O'Hara.

Figure 2. *Stomatodexia* sp. from Ida Canyon, Huachuca Mountains, Arizona, United States.

3 males: USA, Arizona, Huachuca Mountains, Ramsey Canyon, Hamburg Trail, 31°26.2'N 110°19.2'W, ca. 6200' [1890 m], 9–10.viii.2013, J.E. O'Hara. The right legs of one of these are preserved in 95% ethanol for possible future molecular study (specimen code OH10-08-13-004).

Stomatodexia sp. keys to *Leskia* Robineau-Desvoidy in Wood (1987) and Wood & Zumbado (2010). The two genera differ in part by the relative lengths of the two notopleural setae: the anterior seta is longer in *Stomatodexia* spp., whereas the two setae are subequal in length in *Leskia* spp. (D.M. Wood, pers. comm.).

New species record for America north of Mexico

***Calolydella summatis* Reinhard, 1975 (Exoristinae, Blondeliini)**
Fig. 3

Calolydella summatis Reinhard, 1975: 1158. Holotype male (CNC, examined). Type locality: Mexico, Durango, El Salto, 8000 ft [2440 m].

The CNC has 14 males and females of *C. summatis* from the state of Durango, Mexico, mostly belonging to the type series. One of these was photographed for the TachImage Gallery (Tachimages 00503 [Fig. 3, right], 00504 [Fig. 3, left]).

There are five specimens of *C. summatis* in CNC from America north of Mexico, all from Ramsey Canyon in the Huachuca Mountains of southen Arizona. The earliest was collected in a Malaise trap by R.F. Sternitzky on 11.iv.1967 at 5200 ft [1585 m]. The next two were collected by B.V. Brown (Natural History Museum of Los Angeles County, Los Angeles), also in Malaise traps, on 2–13.viii.1986 and 22.vi.1987 at 1700 m. These specimens from Ramsey Canyon were either overlooked during the preparation of O'Hara & Wood (2004) or were identified later. The new record for America north of Mexico reported here came to light when I collected and identified the following two specimens in 2013:

1 male: USA, Arizona, Huachuca Mountains, Ramsey Canyon, Hamburg Trail, 31°26.3'N 110°19.2'W, ca.

Figure 3. *Calolydella summatis* Reinhard from 14 mi. SW. El Salto, Durango, Mexico. Left, dorsal view. Right, lateral view.

6300' [1920 m], 30.v.2013, J.E. O'Hara. The right legs are preserved in 95% ethanol for possible future molecular study (specimen code OH30-05-13-005).

1 male: same data but collected on 1.vi.2013. Right legs preserved in 95% ethanol (specimen code OH01-06-13-006).

There are in CNC many new species of *Calolydella* from Costa Rica reared from caterpillars in Area de Conservación Guanacaste (see Janzen & Hallwachs 2009) or collected as adults by D.M. Wood.

New genus record for Canada

Istocheta Rondani, 1859 (Exoristinae, Blondeliini)

Figs. 4–6

Istocheta Rondani, 1859: 151, 171. Type species: *Istocheta frontosa* Rondani, 1859 (as "Sp. Typ. nova *Frontalis* Mihi", incorrect original spelling, see O'Hara *et al*. 2011: 101) (= *Phorocera cinerea* Macquart, 1850), by original designation.

Istocheta aldrichi (Mesnil, 1953)

Centeter cinerea Aldrich, 1923: 4 (junior secondary homonym of *Phorocera cinerea* Macquart, 1850 and *Metopia cinerea* Perris, 1852). Holotype male (USNM). Type locality: Japan, Honshū, reared at Marioka.
Hyperecteina aldrichi Mesnil, 1953: 50 (*nomen novum* for *Centeter cinerea* Aldrich, 1923).

Istocheta aldrichi is native to the eastern Palaearctic Region (Herting & Dely-Draskovits 1993) and is either native to, or was introduced to, Taiwan in the Oriental Region (O'Hara *et al*. 2009). It is a natural parasitoid of adults of the Japanese beetle, *Popillia japonica* Newman, in Japan. The Japanese beetle was first discovered in the United States near Riverton, New Jersey, in 1916. There, in its new surroundings and free of its natural enemies, it proliferated to almost unimaginable numbers. Clausen *et al*. (1927: 2) illustrated the seriousness of the infestation with this quote from a report by L.B. Smith:

> "During July, 1923, in an orchard of one hundred fifty-six 10-year-old Redbird peach trees, thirteen 16-gallon tubfuls of beetles were shaken from the trees and collected early one morning, in somewhat less than two hours. The next morning the beetles were apparently as numerous on these trees as before."

After intense study of the parasitoids of the Japanese beetle in Japan and related beetles in South Korea, *I. aldrichi* was selected for importation to the United States as a promising biological control agent (Clausen *et al*. 1927: 2). It became established and spread throughout the eastern states from New York and Massachusetts to the District of Columbia (Sabrosky & Arnaud 1965). No reports of *I. aldrichi* from outside this range were found by O'Hara & Wood (2004), but an overlooked online article (Klein 1998) mentions *I. aldrichi* from North Carolina. BugGuide (http://bugguide.net) currently has reports and images of what are assumed to be *I. aldrichi* eggs on Japanese beetles from Maine and New Hampshire. The distribution of the Japanese beetle is closely monitored and is presently recorded from Atlantic Canada (except Newfoundland) to Georgia and westward to Ontario, Minnesota, Nebraska to Texas (Canadian Food Inspection Agency 2012). Eradication programs are attempting to stop the spread of the Japanese beetle to new states.

The presence of *I. aldrichi*-like eggs on the pronota of Japanese beetles is a strong indication of *I. aldrichi* parasitism but is not definitive proof. One cannot discount the possibility, however remote, that a related blondeliine tachinid is responsible, especially

Figure 4. *Istocheta aldrichi* (Mesnil) from Nepean, Ontario, Canada.

outside the known range of *I. aldrichi*. Thus, when parasitized Japanese beetles appeared in my backyard in 2013 (Fig. 5), I set up a Malaise trap and periodically checked vegetation in an effort to verify the presence of *I. aldrichi*. This ad hoc recovery program resulted in a single specimen of *I. aldrichi* (Fig. 4) swept from a leaf of a raspberry plant near feeding Japanese beetles. No *I. aldrichi* were caught in the Malaise trap during six weeks of operation. Label data of the single adult *I. aldrichi* are as follows:

1 female: Canada, Ontario, Nepean [part of greater Ottawa], [street address omitted], 45°19.0'N 75°43.2'W, 20.vii.2013, 90 m, J.E. O'Hara. This specimen was photographed for the TachImage Gallery (Tachimages 00494 [Fig. 4], 00495).

The captured specimen was identified as *I. aldrichi* by comparison with a specimen from Japan and two specimens reared from Japanese beetles at the laboratory in Riverton, New Jersey (see Clausen *et al*. 1927).

I did not carefully study the parasitized beetles in my backyard, but on two occasions I counted the number with and without eggs on their pronota. A count on 23 July 2013 found 10 of 30 beetles with one or more eggs on the pronota (33%). A count on 26 July 2013 found 5 of 32 beetles with one or more eggs on the pronota (16%).

The sex ratio of parasitized beetles was determined by sexing 32 parasitized beetles collected at random during July 2013. These were easily separated into males and females using front leg differences as described and illustrated by Vail *et al*. (2002). Of the 32 beetles, 6 were males and 26 were females. This propensity for ovipositing on females was also noted by Grenier & Liljesthrom (1991). The reason for this behavior is not what one might expect and was discovered by the keen observations of Clausen *et al*. (1927). These authors found that beetles of both sexes have good defensive strategies for evading female *I. aldrichi* but are vulnerable when mating. They described the fly's mode of attack as follows (Clausen *et al*. 1927: 15; see Fig. 6):

> "The manner of oviposition is very unusual in that it leads to the placement of the egg on a restricted portion of the host body. In case the beetles attacked are feeding singly upon the foliage they take alarm immediately a fly alights in the vicinity, and a closer approach leads them to drop to the ground. For this reason oviposition normally takes place upon mating pairs, since these do not take alarm so readily. The female fly may stand about on the leaf for some time, apparently watching the beetles, after which she makes a dash for the pair, running diagonally across the thorax of the female and pausing only for an instant to place an egg thereon. About 98 per cent of all eggs laid are so placed and, under normal conditions such as prevail at Koiwai [Honshū, Japan], about 85 to 96 per cent are upon female beetles."

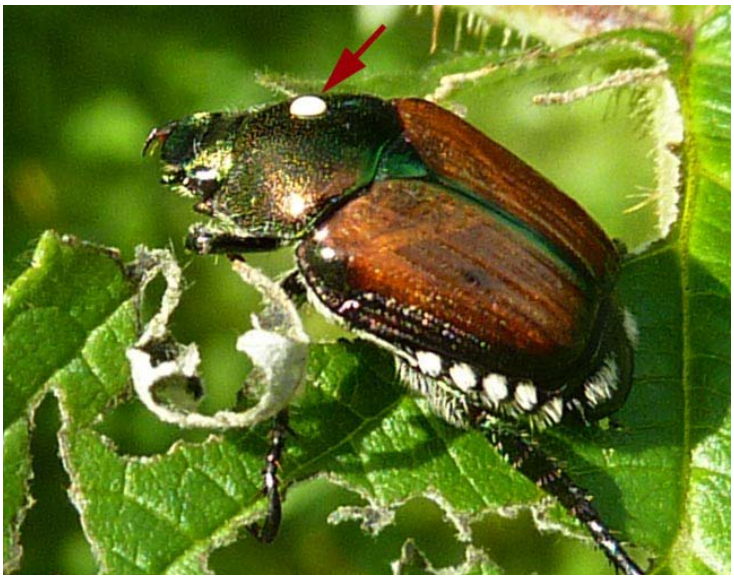

Figure 5. Japanese beetle with tachinid egg (red arrow) attached to pronotum; on raspberry, Nepean, Ontario, Canada.

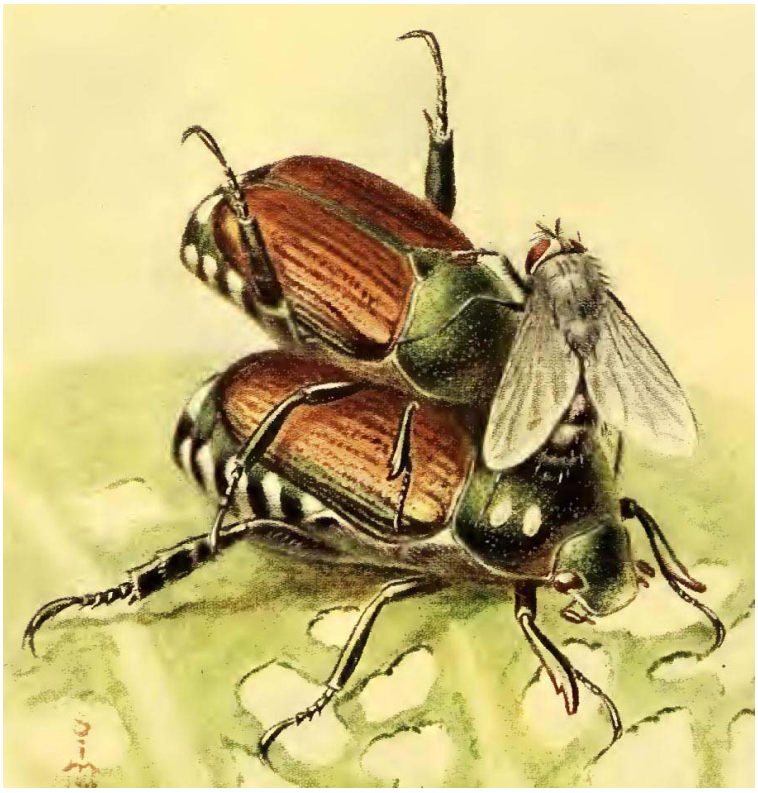

Figure 6. *Istocheta aldrichi* ovipositing on lower (female) Japanese beetle of mating pair (from Clausen *et al*. 1927).

New species record for Canada

***Siphosturmia confusa* Reinhard, 1931 (Exoristinae, Eryciini)**
Fig. 7

Siphosturmia confusa Reinhard, 1931: 6. Holotype male (USNM; paratypes in CNC examined). Type locality: USA, Texas, College Station.

Two Canadian records of *S. confusa* were discovered in CNC while identifying a recently collected Arizona specimen of this species. *Siphosturmia confusa* had been recorded from "California to Texas" by O'Hara & Wood (2004) and is newly recorded from Canada based on the following specimens:

2 males: Canada, Alberta, Tolman Bridge Recreation Area, 17 km east of Trochu, 16–18.vii.1989, J.E. O'Hara. One male was collected with a hand net and the other by Malaise trap. The former was photographed for the TachImage Gallery (Tachimages 00501 [Fig. 7], 00502).

Figure 7. *Siphosturmia confusa* Reinhard from Tolman Bridge Recreation Area, Alberta, Canada.

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