

# A brief report on Tachinidae collected during the 2022 North American Dipterists Society Field Meeting in the New Jersey Pinelands, USA



**Figure 1.** The view from a small hilltop in the New Jersey Pinelands.

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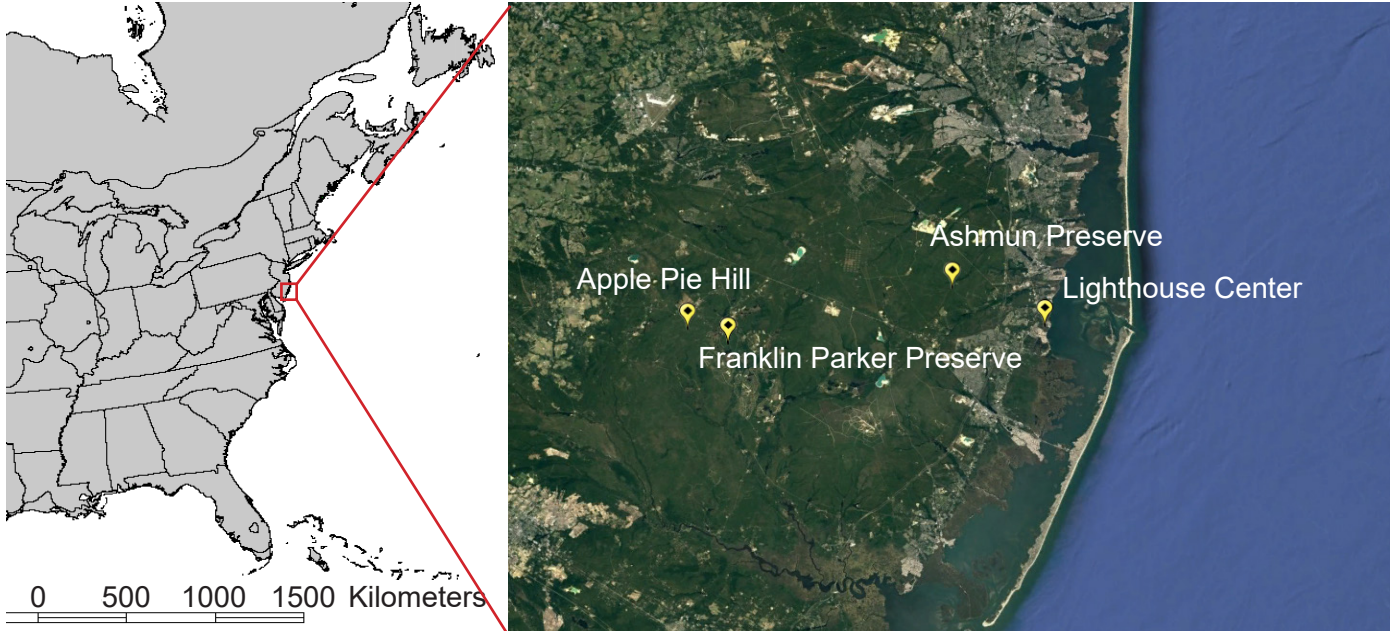
## Introduction

The field meeting of the North American Dipterists Society (NADS) was held in mid-June of 2022 in the Pinelands (or Pine Barrens) of Southern New Jersey. The meeting was organized by Jon Gelhaus of the Academy of Natural Sciences of Drexel University. As in previous NADS field meetings, the meeting consisted largely of field trips to local sites to observe and collect flies, in addition to short research presentations, group meals, and general socializing amongst Diptera aficionados. An overall summary of the meeting was recently published by Gelhaus et al. (2022) in the last issue of *Fly Times*.

The New Jersey Pinelands Region includes a surprisingly large area of natural habitat in the Eastern U.S., clearly visible in satellite images (Fig. 2), despite New Jersey being the most densely populated state in the country. Although the pine barrens are ecologically diverse and unique, the region does not appear to have been heavily surveyed for most Diptera groups. Unfortunately, our collecting of tachinid flies (or bristle flies, as we like to call them) was quite poor, and we were only able to collect a relatively small number of individuals, 58 in total belonging to 30 total species. This poor collecting was partly due to unfavorable weather conditions (at least one day of rain),



a lack of accessible aggregation sites such as bare hilltops, and time spent on other activities resulting in only modest collecting efforts (e.g., we spent a day exploring barrier island habitats at Island Beach State Park on the “Jersey Shore”, where we did no collecting). However, it also appeared that for some reason tachinid activity and abundance was limited in general. Nevertheless, we here provide a report of Tachinidae collected in Southern New Jersey during the NADS meeting with some brief notes on particular habitats and species. All specimens are housed in the JOSC collection at Wright State University.



**Figure 2.** The pine barrens region of Southeastern New Jersey with the four areas where we collected Tachinidae.

## Lighthouse Center

The meeting took place at the Lighthouse Center for Natural Resource Education in Waretown, New Jersey. This former camp for the blind is situated on Barnegat Bay of the New Jersey coast and encompasses a variety of habitats in its nearly 200 acres (about 78.5 ha), including a small area of beach, salt marshes, and coastal hardwood forest. Most of our collecting effort at this site was via two 6m Malaise traps (ours and that of Greg Dahlem) and through night collecting at a mercury vapor lamp and UV-light set up in an open area next to the Lighthouse Center lab building. We also tried some hand collecting along the forest edges, however these efforts were futile – we failed to net a single tachinid at this site. In addition, the Malaise traps (Fig. 3) captured remarkably few individuals and species relative to other places we have collected in the Northeastern region of the U.S. (Table 1).

Perhaps our most interesting find at this site was a series of *Cryptomeigenia* specimens belonging to three species (Fig. 4A-C) and the odd-looking dexiine, *Eutrixa exilis* (Coq.) (Fig. 4D). Interestingly, both of these groups attack adult beetles (primarily Scarabaeidae), and all of the specimens we collected via night lighting and in the Malaise traps were females, suggesting that our visit coincided with prime scarab-hunting season. *Cryptomeigenia* species are often quite similar in external appearance, but the variety of female terminalia



**Figure 3.** A Malaise trap at the Lighthouse Nature Center (with student Joe Wilson).

is remarkable, ranging from short, unmodified ovipositors to scoop-like plates to long, sharp piercers. This would be a fascinating group in which to explore the evolution of piercing terminalia as Blaschke et al. (2018) did with the Phasiinae.

**Table 1.** Tachinid species collected at the Lighthouse Nature Center (USA: NJ: Ocean Co., Waretown, 39.774, -74.196). Light at night = UV light or mercury vapor lamp.

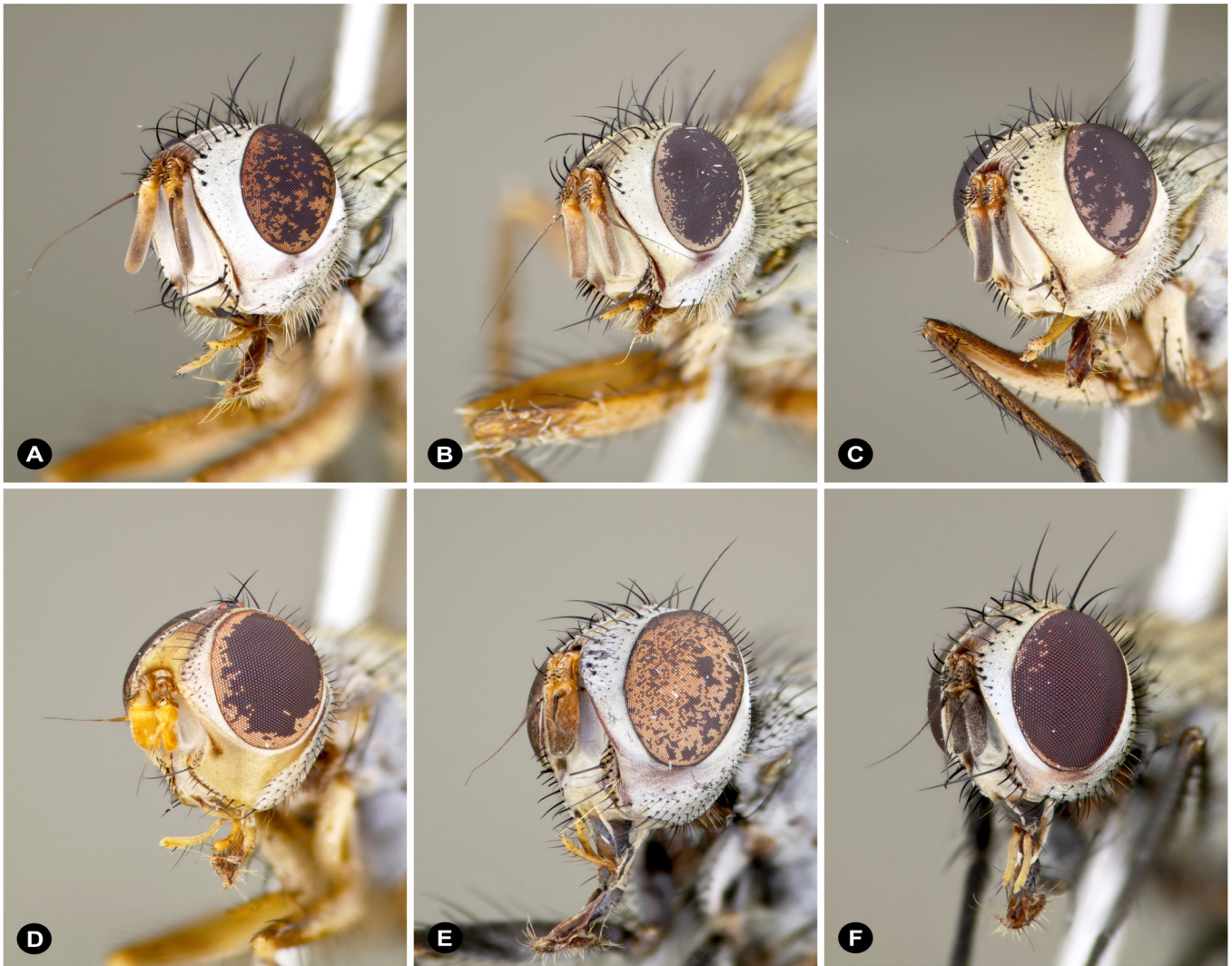
Tachinid species	M	F	Method	Date(s)
<b>Dexiinae: Eutrixini</b>				
<i>Eutrixia exilis</i> (Coquillett)		1	Light at night	6/12
<b>Voriini</b>				
<i>Thelaira americana</i> Brooks		1	Malaise Trap	6/15
<b>Exoristinae: Blondeliini</b>				
<i>Admontia ?pergandei</i> (Coquillett)	1		Malaise Trap	6/14-15
<i>Blondelia</i> n. sp. nr. <i>polita</i> <sup>1</sup> (Townsend)	1		Light at night	6/13
<i>Cryptomeigenia demylus</i> (Walker)		4	Light at night (3) <sup>2</sup> /Malaise (1)	6/12, 13, 15
<i>Cryptomeigenia dubia</i> Curran		3	Window at night (1)/Malaise (2)	6/14-15
<i>Cryptomeigenia</i> cf. <i>simplex</i> Curran		1	Malaise Trap	6/15
<b>Euthelairini</b>				
<i>Neomintho celeris</i> (Townsend)		1	Malaise Trap	6/15
<b>Goniini</b>				
<i>Hyphantrophaga blanda</i> (Osten Sacken)		1	Malaise Trap	6/13
<i>Hyphantrophaga</i> cf. <i>sellersi</i> <sup>3</sup> (Sabrosky)	1		Malaise Trap	6/14
<b>Phasiinae: Gymnosomatini</b>				
<i>Gymnoclytia occidua</i> (Walker)		1	Malaise Trap	6/15
<b>Tachininae: Leskiini</b>				
<i>Genea texensis</i> (Townsend)		3	Malaise Trap	6/14
<b>Minthoini</b>				
<i>Paradidyma affinis</i> Reinhard		2	Malaise Trap	6/15
<i>Paradidyma singularis</i> (Townsend)		1	Light at night	6/12
<b>Siphonini</b>				
<i>Actia diffidens</i> Curran		1	Malaise Trap	6/13

<sup>1</sup> See discussion of Candace Mckee Ashmun Preserve below.

<sup>2</sup> One specimen collected by Z. Dankowicz.

<sup>3</sup> Keys to *H. autographae* (from Cuba), but *H. sellersi* seems more likely. Tarsi and body black in ground color.





**Figure 4.** Head views of some of the primarily nocturnal, adult beetle-attacking, tachinid species we collected (all females). **A.** *Cryptomeigenia demylus* (Walker) (Exoristinae, Blondeliini). **B.** *C. cf. simplex* Curran. **C.** *C. dubia* Curran. **D.** *Eutrixia exilis* (Coquillett) (Dexiinae, Eutrixini). **E.** *Zaira georgiae* (B. & B.) (Blondeliini). **F.** *Zaira* n. sp.? (Images varied in scale.)

## Candace Mckee Ashmun Preserve

The Candace Mckee Ashmun Preserve is a 4,000 acre preserve embedded in the larger (20,000 acre) Forked River Mountain Wildlife Area, located on the eastern edge of the New Jersey Pine Barrens. This area consists of classic pine barrens habitat, characterized by a broken forest (interspersed with openings) of mostly pitch pine and scattered oaks, with a fern-ericaceous-grass understory, growing on nutrient poor, white sand soils (Fig. 5). This piney upland habitat is interspersed with low-lying Atlantic white cedar and black gum swamps and other wetlands. The New Jersey Pine Barrens are the largest remnant of Atlantic pine barrens habitat, which is ecologically distinct from the surrounding eastern deciduous forest and harbors a number of endemic plant and animal species. We hand collected along a trail in the preserve on June 12th (with some spraying of honey-water on leaves), and again on June 15th, when a local conservation manager Bill Scullion guided us to a small hilltop in the middle of the forest. Although the small hilltop failed to attract tachinids, it did provide nice views of the surrounding landscape (Figs. 1, 6). Collecting was again relatively poor, amounting to only 15 individuals of nine species (Table 2), however, we did find some noteworthy taxa.



We collected a nice series of males of an undescribed *Blondelia* species on foliage along a trail in the preserve. This species was also collected at every other site where we collected during the trip. Although it bears a superficial resemblance to *B. polita* (Townsend), being somewhat small and dark (Fig. 7A), it is clearly distinguished from this and all other described North America species in having proclinate orbital setae in the males, and the facial ridge bristled on more than the lower half. Two females collected at the Franklin-Parker Preserve (below), bearing characteristic piercers and spine-like setae on the ventral abdominal tergites, confirm the species' placement in the genus *Blondelia*. We have collected similar (possibly conspecific) *Blondelia* specimens in the Eastern U.S. states of Kentucky (O'Hara & Stireman 2016) and West Virginia (Stireman & Perilla López 2022), suggesting that this unusual species or species complex is not restricted to the New Jersey coastal plain. Another notable find at the Ashmun Preserve was a small-bodied *Chetogena* species near *C. lophryi*. The two collected males were compared with *C. lophryi* and other *Chetogena* species in the CNC and USNM, and they are clearly distinct in terms of coloration (e.g., strongly gold fronto-orbital plate, thorax, and abdomen; Fig. 7B), external morphology (e.g., broad postpedicel), and terminalia. An additional male of this species was collected at Franklin Parker Preserve. A final interesting find was a female of *Zaira georgiae* (Brauer & Bergenstamm) (Fig. 4E). Members of this genus are typically nocturnal and attack adult beetles, like the related *Cryptomeigenia*, but this individual was collected during the day (sometime between about 10 AM and 2 PM), and this species may be diurnal.

**Table 2.** Tachinid species collected at the Candace Mckee Ashmun Preserve (USA: NJ: Ocean Co., 39.80, -74.266).

Tachinid species	M	F	Method	Date(s)
Exoristinae: Blondeliini				
<i>Blondelia</i> n. sp. nr. <i>polita</i> (Townsend)	5		Hand net	6/13, 15
<i>Phyllophilopsis</i> ? <i>nitens</i> (Coquillett)		1	Hand net	6/13
<i>Zaira georgiae</i> (Brauer & Bergenstamm)		1	Hand net	6/13
Eryciini				
<i>Lespesia</i> cf. <i>flavifrons</i> Beneway		1	Hand net	6/13
Euthelairini				
<i>Neomintho celeris</i> (Townsend)		1	Hand net	6/13
Exoristini				
<i>Chetogena</i> n. sp. nr. <i>lophryi</i> (Townsend)	2			6/13
Winthemiini				
<i>Winthemia citheronia</i> Sabrosky	1		Hand net	6/13
Tachininae: Tachinini				
<i>Archytas aterrimus</i> (Rob.-Des.) complex		2	Hand net	6/13
<i>Deopalpus hirsutus</i> Townsend		1	Hand net	6/13





**Figure 5.** A sandy trail we followed looking for tachinids in the Candace Mckee Ashmun Preserve, illustrating typical pine barrens habitat.



**Figure 6.** Fly collectors on a small hilltop overlooking the Candace Mckee Ashmun Preserve and surrounding pine barrens. From left to right: Joe Wilson (an undergraduate interested in Asilidae), Juan Manuel Perilla López, Greg Dahlem, and John Stireman.





**Figure 7.** Some notable tachinids collected in the New Jersey Pine Barrens. **A.** *Blondelia* n. sp. nr. *polita* (Townsend) (Exoristinae, Blondeliini), ♂. **B.** *Chetogena* n. sp. nr. *lophryi* (Townsend) (Exoristinae, Exoristini), ♂. **C.** *Oestrophasia calva* Coquillett (Dexiinae, Oestrophasiini), ♂. **D.** *Phytomyptera* sp. nr. *johnsoni* (Coquillett) (Tachininae: Graphogastrini), ♀. (Images varied in scale.)

## Franklin Parker Preserve and Apple Pie Hill

One of the group excursions of the NADS meeting was to the Franklin Parker Preserve in the heart of the pine barrens. This preserve encompasses over 9,000 acres of pine-oak forests, bogs, and lakes, and is surrounded by 250,000 acres of public conservation lands including state forests and wildlife management areas. We spent several hours here looking for flies, mostly in open areas and along forest edges (Fig. 8). Although the area was relatively good for bombyliids and asilids, we collected few tachinids. We returned to the area after dinner to try some night collecting at a UV light, and were rewarded with a handful of additional tachinid specimens.

In addition to obtaining more specimens of the apparently undescribed *Blondelia* and *Chetogena* species mentioned above (Table 3), we made a few new “discoveries” at Parker Reserve. First, we collected two specimens of the interesting oestrophasiine *Oestrophasia calva* Coq. (one of which was later lost; Fig. 7C). *Oestrophasia*, like *Cryptomeigenia* and *Zaira*, are parasitoids of adult beetles, but unlike these distantly related blondeliines, they apparently accomplish parasitism via microtype eggs that are ingested by the host beetles (de Santis & Nihei 2022). Continuing with the adult beetle parasitoid theme, we collected two conspecific females of the genus *Zaira*

at the UV-light at night (Fig. 4F). This is a difficult genus that is in need of revision, but we could not match these specimens to any known species. We suspect it may represent yet another undescribed species (note the relatively large eye compared to the other nocturnal beetle parasitoids). A third noteworthy species collected in the Preserve was an attractive species of *Phytomyptera* represented by a single female specimen. This small, dark, fly with wings boldly marked anteriorly (Fig. 7D) may also represent a new species. It is similar to *P. johnsoni* (Coquillett), sharing with this species marked wings, but comparisons with specimens of this species in collections suggests our specimen is distinct, or at the very least an unusual variant.

**Table 3.** Tachinid species collected at the Franklin Parker Preserve (USA: NJ: Burlington Co., Chatsworth, 39.81, -74.55, “FPP”) and neighboring Apple Pie Hill (USA: NJ: Burlington Co., Chatsworth 39.807, -74.590, “APH”). Light at night = UV light or mercury vapor lamp.

Tachinid species	M	F	Method	Date(s)
<b>Dexiinae: Dexiini</b>				
<i>Ptilodexia</i> ? <i>caroliniensis</i> (Brauer and Bergenstamm) <sup>1</sup>	1		FPP: Hand net	6/14
<b>Oestrophiini</b>				
<i>Oestrophia calva</i> Coquillett	1		FPP: Hand net	6/14
<b>Sophiini</b>				
<i>Cordyligaster septentrionalis</i> Townsend <sup>2</sup>	1		FPP: Hand net	6/15
<b>Exoristinae: Blondeliini</b>				
<i>Blondelia</i> n. sp. nr. <i>polita</i> (Townsend) <sup>3</sup>	2	2	FPP (3), APH (1): Hand net	6/14, 15
<i>Oswaldia</i> sp. nr. <i>conica</i> (Reinhard)	1		FPP: Light at night	6/14
<i>Zaira</i> n. sp.		2	FPP: Light at night	6/14
<b>Exoristini</b>				
<i>Chetogena</i> n. sp. nr. <i>lophryi</i> (Townsend)	1	1	FPP: Hand net	6/14
<i>Chetogena</i> cf. <i>scutellaris</i> (van der Wulp)		1	APH: Hand net	
<b>Goniini</b>				
<i>Distichona</i> nr. <i>autumnalis</i> (Townsend) <sup>4</sup>		1	FPP: Hand net	6/14
<b>Tachininae: Graphogastrini</b>				
<i>Phytomyptera</i> sp. nr. <i>johnsoni</i> (Coquillett)		1	FPP: Hand net	6/14
<b>Minthoini</b>				
<i>Paradidyma affinis</i> Reinhard		1	FPP: Hand net	6/14
<i>Paradidyma singularis</i> (Townsend)	1	2	FPP: Light at night	6/14
<b>Tachinini</b>				
<i>Archytas aterrimus</i> (Rob.-Des.) complex	1		APH: Hand net	6/14

<sup>1</sup> This specimen could not be definitively identified and could be undescribed. It is dark like *P. obscura*, with the haustellum of intermediate length (0.57x head height) and a relatively robust body. It is most similar to *P. caroliniensis* but lacks red orange coloration on the abdomen and the haustellum is somewhat long.

<sup>2</sup> Collected by J. Gelhaus.

<sup>3</sup> This is a difficult genus and this specimen may belong to *O. conica* or perhaps an undescribed species.

<sup>4</sup> Probably *D. autumnalis*, but legs black, parafacial whitish, and abdominal microtomentum gray, in contrast to specimens collected in nearby West Virginia.



On our last day of collecting (June 15) we visited the nearby site of Apple Pie Hill. This is the highest point in the pine barrens region, rising a meager 209 ft. (63.7m) above sea level. As might be expected, a fire lookout tower sits atop the main hill. The fire tower itself is surrounded by a fence and was not accessible, but we looked for hilltopping tachinids around the periphery of the tower. During our search for bristle flies, we seem to have inadvertently set off an alarm, because an ear-piercing siren began wailing from the tower shortly after we arrived and we were forced to abandon our collecting efforts. Despite this site being a hilltop, we observed very few tachinids and collected only a handful (Table 3).



**Figure 8.** An artificial open grassy area surrounded by pine forest within the Franklin Parker Preserve. Several tachinids including a female of *Oestrophasia calva* were collected along this forest edge.

## Final Thoughts

Although the total yield of our collecting efforts in terms of tachinid specimens and species was disappointing, we are glad we joined the meeting and visited the pine barrens. It is a unique area, reminiscent of forests far to the south or west, containing a variety of interesting habitats. As mentioned previously, the extent of natural and semi-natural habitat of the pine barrens in such a densely populated region is surprising and refreshing, and we look forward to returning and exploring the area more thoroughly.

The reasons behind our weak collecting results are unclear. As stated previously, we believe our poor collecting reflected a true lack of tachinid activity, as evidenced by the very low Malaise trap catches. This low level of activity could be due to the season we visited, perhaps being between major pulses of tachinid abundance associated with variation in host availability (i.e., between spring and later summer generations of caterpillars; Stireman & Workman 2023). The lack of clear aggregation sites where tachinid activity might be concentrated, such as bare

hilltops or isolated canopy openings, may also have limited our success. Aggregation sites for tachinids must surely exist, but perhaps these are highly dispersed or associated with inaccessible areas of the canopy. Finally, although the pine barrens habitat is interesting and unique, the white sandy soils are nutrient-poor and the forest tends to be dominated by a relatively few highly tolerant tree and understory shrub species. Such low diversity in woody plants and perhaps low plant productivity could result in relatively low abundance and diversity of hosts, and hence tachinids. Shortly after our trip to New Jersey (18 June 2022) we stopped at an Appalachian forest site in eastern West Virginia (the Romney site of Stireman & Perilla López 2022) and were able to hand collect 83 individuals of 49 species in a single day with only moderate effort, considerably more than we collected in New Jersey over four days including Malaise trapping and night lighting.

Despite the relative low numbers of tachinid specimens we collected in New Jersey, we recovered a number of quite interesting taxa, including at least three apparently undescribed species and several others that could not be definitively assigned to a described species (representing new species or morphological variants or difficult species complexes). We are continually surprised at the discovery of novel species (and subspecific forms) in the relatively well-studied Eastern U.S. We are also often frustrated by our inability to confidently identify species from this region due to a lack of keys and modern taxonomic revisions, and the presence of many morphologically-difficult species complexes. Both of these issues highlight the need for more basic taxonomic study of North American Tachinidae. One benefit of our relatively poor collecting results was that we were able to spend more time scrutinizing the few specimens we did collect, carefully comparing them with museum specimens and identifying potentially new taxa. As the familiar adage states, sometimes “less is more.”

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