
A glimpse into the
incredible diversity of
Ecuadorean Tachinidae

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PRECEDING PAGE: Figure 1. The author next to Cascada Río Hollín, Napo Province, Ecuador. (Photo by Voker Bahn.)

Introduction

In the summer of 2023 I had the opportunity to visit the tropical South American country of Ecuador for two weeks with a study abroad course from my university focused on Tropical Ecology. I wasn't actually teaching the course, but I was invited to come along by the instructors due to my previous experience in Ecuador and knowledge of insects. I have visited Ecuador several times previously and have been enthralled by the great diversity of Andean tachinids, so I was excited to go along on the course. The fact that all the transportation and lodging were already arranged made it even more attractive – I didn't have to concern myself with trip logistics. However, this also meant I was somewhat at the mercy of the course itinerary in terms of where and when I was able to wander off and look for flies. Birds were the major focus of instructors for the course and the stops and sites visited were organized around visiting different types of tropical habitats and observing the local avifauna. This often was not ideal for collecting flies, but it did allow me to visit a wide variety of habitats. Fortuitously, I was able to obtain a permit to collect flies with the aid of my friend and colleague, Dr. Diego Inclán, director of INABIO – Ecuador's national biodiversity institute – and fellow "bristle fly" enthusiast (e.g., see Inclán & Stireman 2013, Inclán et al. 2014). A major long-term goal of INABIO is to inventory the species of Ecuador. As a research associate of INABIO I am trying to aid them in this endeavor, challenging as it may be. All of the flies I collected technically belong to Ecuador but are on loan to me. In this article, I briefly recount some of the locations that I visited and provide lists of tachinid genera and species (mostly morphospecies) that I was able to collect, including some notes on select taxa. I then examine a few broad patterns of diversity and composition based on the specimens collected.

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Ecuador

As the country's name indicates, Ecuador is located on the equator in South America. The smallish country (slightly larger than the U.K., similar to the U.S. state of Wyoming) is bisected by the Andes Mountains, whose lofty volcanic peaks (4000 m+) and ridges divide the country into the lowland tropical forests of the Amazon Basin to the east and Chocoan tropical rainforest and deciduous coastal forests to the west (Fig. 2). Due to the great diversity of habitats and elevational turnover on the Andean slopes, the country is exceedingly diverse biologically, with more than 16,000 vascular plant species (Jørgensen & León-Yánez 1999), at least 1686 bird species (Freile et al. 2024), 477 reptile species (Torres-Carvajal et al. 2019), 3000 butterfly species (Wilmott & Hall 2024), and who knows how many bristle flies! Ecuador boasts many reserves and protected areas and the government has paid some attention to the value of its great biodiversity resources, but threats to native habitats and species are increasing. Due to its diversity of species and habitats, and its reserve system, Ecuador has been popular with eco-tourists for decades (although recent shifts in South American drug trafficking have recently made some areas less safe for travel).

Methods

Because I was travelling with a university course on a bus, I generally went where the course went, which was focused on the Eastern Andean slope in central Ecuador, from the high páramo to the Amazon Basin. However, near the end of the course I was able to meet Diego Inclán and we visited a couple sites on the western slope and nearby lowlands.

My collecting was opportunistic. I grabbed my net and looked for flies whenever we stopped somewhere for long enough, the weather was conducive, and collecting was not prohibited. On most days it was raining or misting or heavily overcast and collecting was poor or nonexistant. Sometimes the sun would come out for a short while, usually while I was on the bus, and then as soon as we stepped off, the clouds would return (or at least it seemed so). Most specimens were obtained from a few sites and days where we experienced rare sunny or partly cloudy conditions. The majority of species were collected from one site, San Isidro, where I spent several nights and was able to collect on multiple days.

All collecting was done by hand with a butterfly net except for a few specimens that were cornered in buildings or were otherwise possible to collect directly into a vial or by hand (a few were brought to me by students on the course). Collecting was generally focused along roadsides, trails, or other forest edges, with flies being caught as they rested or skittered around on leaves. In several areas I employed a honey-water-cola spray ("fly juice") to enhance collecting success. I observed few plants with flowers that tachinids might be apt to visit actually flowering, and very few of the tachinids collected were from flowers.

Figure 2. A physical map of Ecuador showing sites where > 1 tachinid species were collected (and Quito, the capital).

Flies were killed in a collection tube, moved to a labeled vial, and usually pinned the evening they were collected. Once I returned to my laboratory in Ohio, genera and species were identified using Wood & Zumbado (2010), Wood (1985), Townsend (1934–1942 and other works), and, when available, various keys to species of particular genera, as well as with specimens in my collection (JOSC). Often, specimens did not match satisfactorily with any genus in keys or my collection. These may reflect species that depart from the norm in known genera, undescribed genera, or known genera that I was simply unable to recognize. I have typically indicated these as a proposed genus with a question mark or indicated that they are "near" a particular genus. Some of the generic identifications and suggestions are probably incorrect. Very few specimens could be identified to species, and many of those that I did provide species names for are tentative identifications. This most likely reflects the vast diversity of undescribed species in the region, although it is possible (perhaps likely) that some of my unidentified species are in fact described.

Sites and Collecting Results

La Sierra – Andes Mountains

The High Country

After arriving in Quito on June 23rd and spending the night at a hotel near the airport, we headed up to the nearby Andean highlands (Fig. 3). High elevation páramo habitats of the Andes are extremely interesting biologically, and, when the weather clears, they offer amazing uninterrupted vistas of massive volcanos, shimmering grasslands, and scrub covered hillocks. At higher elevations, but below the permanent snow, plant communities are dominated by alien looking, cushion-forming herbs, club mosses, and bunch grasses. The Andean páramo also harbors a diversity of interesting Tachinidae. Unfortunately for me, it is also often cold, foggy, and windy, and I collected few tachinids in the higher Andes despite spending multiple days there. I was able to collect a few tachinids around a restaurant where we stopped for lunch near Parque Nacional Antisana, including a few larger "hedgehog" flies in the tribes Tachinini and Polideini and some smaller blondeliines. Perhaps most notable was a robust species of *Patelloa* (or something near it; Fig. 13C), that has apparently converged on the robust "hedgehog syndrome". Interestingly, a species of *Microphthalma* (Megaprosopini; Fig. 13A) that I collected here, was also encountered outside my hotel in Quito at the end of the trip (~1100 m lower in elevation).

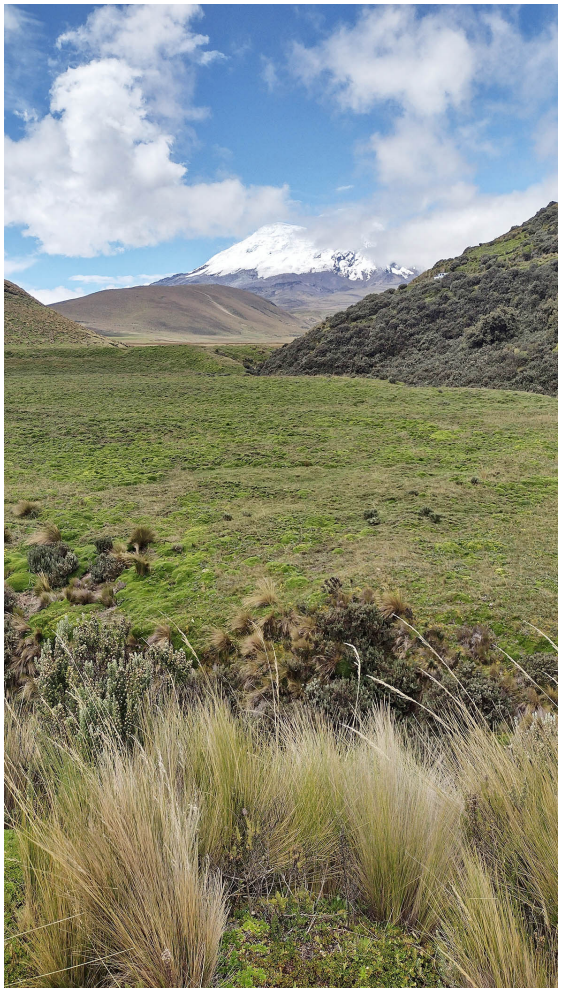

Figure 3. A rare break in the clouds allows a view of 5753 m Volcán Antisana from the surrounding high páramo plains.

nr. Laguna de Secas, west of PN Antisana (24 June) 3545 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Exoristinae	Blondeliini	G. nr. *Eribella*/*Lydinolydella* sp. 1	1	0	1	does not key
Exoristinae	Blondeliini	*Sphaerina* (or G. nr.) sp. 2	4	0	4	
Tachininae	Goniini	*Patelloa* (or G. nr.) #1 sp. 1	0	1	1	hedgehog fly mimic
Tachininae	Megaprosopini	*Microphthalma* sp. nr. *cuzcana* Townsend	0	1	1	
Tachininae	Polideini	*Hystricia flavitibia* Curran	1	1	2	
Tachininae	Tachinini ("Dejeaniini")	*Eulasiopalpus vittatus* Curran	1	0	1	
Laguna Papallacta (27 June) 3380 m						
Subfamily		**Species**	**M**	**F**	**Tot**	**Notes**
Exoristinae	Blondeliini	G. nr. *Eribella*/*Lydinolydella* sp. 1	1	0	1	does not key
Quito (6 July) 2640 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Tachininae	Megaprosopini	*Microphthalma* sp. nr. *cuzcana* Townsend	1	0	1	

Tropical Montane Forest/Cloud Forest

We spent most of our time a bit lower than the páramo in the tropical montane forest and cloud forests on the eastern slope of the Andes between about 2700 m and 2000 m. This region is characterized by steep ridges and deep valleys swathed in dense forests of moderate stature. My past experience suggests that these elevations and habitats host an enormously rich fauna of tachinid flies and it did not disappoint.

Guango Lodge

The first site, where we spent several days, was Guango Lodge (2680 m), a private lodge and small forest reserve that is popular with birdwatchers due to the great richness and abundance of hummingbirds. Although the area is likely very rich in bristle flies as well, the cool temperatures and frequent rain and fog severely limited opportunities to observe, appreciate, and document this diversity. I don't recall seeing the sun at all during my stay here, but there were some days when the rain stopped and the sky lightened up sufficiently for some fly activity. Most of my collecting took place on a single day along an oil pipeline right-of-way that had been cleared of larger vegetation (Fig. 4). The results were dominated by smaller bodied Blondeliini and Voriini (*sensu lato*), including several specimens of possibly *Leptomacquartia* that are confusingly rhinophorid-like (Fig. 14F). Most of the species collected were blackish in color with variously darkened wings (often along the fore edge or along major veins) leading to confusing similarity among species (e.g., Figs. 13B, 14A). This same black body-dark wing syndrome was common among the co-occurring muscids as well. A likely hypothesis is that this reflects convergent adaptation to absorb solar radiation and warm up quickly in the brief periods of sunlight in this cool and cloudy habitat. A single species of *Winthemia* was collected (4 specimens), drawing attention to the relative scarcity of this genus among the mid-elevation Andean tachinid fauna. Collections and rearing from lower elevations in the Neotropics reveal a seemingly limitless diversity of species in this difficult genus, but in the cloud forests *Winthemia* seems to be rather uncommon.

Figure 4. Students walking along the pipeline right-of-way near Guango Lodge. Nearly all tachinids collected at this site were from vegetation along this path.

Guango Lodge (25 June) 2680 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Dexiinae	Dufouriini	*Ebenia* sp. 1	0	1	1	
Dexiinae	Voriini	*Campylocheta* sp. 4	1	0	1	
Dexiinae	Voriini	*Campylocheta* sp. 5	1	0	1	assuming = female from San Isidro?
Dexiinae	Voriini	*Cyrtophleba* sp. 2	0	1	1	
Dexiinae	Voriini	*Leptomacquartia* (?) sp. 1	0	2	2	looks like Rhinophoridae
Dexiinae	Voriini	*Trafoia* sp. 2B	1	0	1	could be male of 2A - but no ocellars and slight color differences
Dexiinae	Voriini	G. nr. *Cyrtophleba* sp. 1	1	0	1	
Dexiinae	Voriini ("Uramyini")	*Thelairaporia* (?) sp. 2	0	1	1	specimen decapitated in EtOH
Dexiinae	Voriini ("Uramyini")	*Thelairaporia* sp. 1	1	0	1	
Dexiinae	Voriini ("Uramyini")	*Thelairaporia* sp. 3	1	0	1	
Exoristinae	Blondeliini	*Anoxynops* sp. 3	1	0	1	
Exoristinae	Blondeliini	*Anoxynops* sp. 4	0	1	1	
Exoristinae	Blondeliini	Blondeliini G. poss. nr *Vibrissina* sp. 1	1	0	1	broad curved pafc. Not sure if even Blondeliini!
Exoristinae	Blondeliini	*Calolydella* sp. 2b	1	0	1	v. similar to *C.* sp. 2, could be conspecific but differs in coloration
Exoristinae	Blondeliini	*Calolydella* sp. 6	0	1	1	similar to *C.* sp. 5
Exoristinae	Blondeliini	*Chaetodoria conica*? Townsend	1	0	1	
Exoristinae	Blondeliini	*Chaetostigmoptera* (or G. nr.) sp. 1	1	0	1	
Exoristinae	Blondeliini	*Chaetostigmoptera* sp. 2	0	1	1	
Exoristinae	Blondeliini	*Cryptomeigenia* (or G. nr.) sp. 2	2	2	4	could be very weird *Vibrissina*?
Exoristinae	Blondeliini	*Erythromelana* cf. *jaena* Inclán	1	0	1	palpi diff. than *E. jaena* above, but unsure if diff. sp.
Exoristinae	Blondeliini	*Erythromelana jaena* Inclán	0	1	1	
Exoristinae	Blondeliini	*Eucelatoria nana* grp. sp. 3	0	1	1	
Exoristinae	Blondeliini	G. nr. *Eribella*/*Lydinolydella* sp. 1	1	0	1	see also Antisana, Papallacta
Exoristinae	Blondeliini	G. nr. *Lydinolydella* sp. 2	2	0	2	unsure of genus, striking wing markings
Exoristinae	Blondeliini	*Hypoproxynops* sp. 1	1	1	2	
Exoristinae	Blondeliini	*Italispidea* sp. 1A	0	1	1	
Exoristinae	Blondeliini	*Italispidea* sp. 2A	2	1	3	
Exoristinae	Blondeliini	*Italispidea* sp. 2B	1	1	2	

Exoristinae	Blondeliini	*Italispidea* sp. 2C	0	1	1	
Exoristinae	Blondeliini	*Italispidea* sp. 9	0	1	1	
Exoristinae	Blondeliini	*Lixophaga*/*Calolydella* sp. 5	0	1	1	diff. than *Calolydella*/ *Lixophaga* sp. 5
Exoristinae	Blondeliini	*Myiopharus* sp. 7	1	0	1	
Exoristinae	Blondeliini	*Myiopharus* sp. 9	2	1	3	
Exoristinae	Blondeliini	*Myiopharus*? sp. 5B	0	1	1	could be distinct sp. from *M.* 5A, but quite similar
Exoristinae	Blondeliini	*Neominthopsis* (??) sp. 1	1	0	1	odd *Lixophaga*? *Eribella*?
Exoristinae	Goniini	G. nr. *Houghia* sp. 1	1	0	1	
Exoristinae	Goniini	Unk. G. nr. *Aplomyodoria*? sp. 2	1	0	1	
Exoristinae	Winthemiini	*Winthemia* sp. nr. *patagonica* (Blanchard)	2	2	4	
Tachininae	Minthoini	*Paradidyma* sp. 1	0	4	4	
Tachininae	Siphonini	*Siphona* sp.	0	1	1	

San Isidro area

Cabañas San Isidro is an ecolodge just down the road from Yanayacu Biological Field Station, a place I have visited and conducted research at off and on over the past 20 years (e.g., Stireman et al. 2017). Compared to the relatively bare bones and inexpensive Yanayacu, San Isidro is downright posh. It even has a heated swimming pool! Like Guango Lodge, it caters primarily to well-heeled birders. The lodge is surrounded by a very nice reserve of apparently primary montane tropical forest that can be explored on a number of relatively well-maintained trails. It occupies a "hanging valley" – a relatively flat (emphasis on the relatively) valley surrounded by steeper portions above and below. This makes it more accessible than the typical steep and narrow valleys of the Eastern Ecuadorean Andes. While at San Isidro, I was fortunate to have a couple of sunny days (or at least mornings or afternoons) for collecting flies. My collecting was focused on vegetation growing along the roadside next to the lodge grounds and along a trail that bordered forest on one side and more open, grassy, and somewhat swampy habitat on the other (Fig. 5). A couple specimens were also collected at a brief stop at the nearby Guacamayos ridge (Fig. 6), including a species of bristly *Chrysotachina* that is being described by my former PhD student, Juan Manuel Perilla López.

My collecting experience at San Isidro, as well as previous experience collecting tachinids in various parts of Ecuador, suggests to me that this type of forest at around this elevation (~2000 m) is where the peak of Andean tachinid diversity lies. The diversity seems endless – even in a small area. If one locates a good sunny, forest edge, and sprays a little sugar solution on the foliage, you can basically just stand there and keep busy collecting and stuffing flies into vials for hours as the flies keep coming in (Fig. 7; see this link for a short video of one particularly "hopping" spot [watch video]). After some time spent collecting in this manner, I started trying to avoid collecting more individuals of species that I thought I already had several of. This was due to both constraints on space in which to store pinned specimens and because I couldn't help but feel a little bad about killing so many beautiful flies. I note however, that it is very unlikely that my collecting in this small area for this few days had any impact on the tachinid populations. Also, I cursed myself later, as I realized how many species are superficially similar and how many I might have missed due to my restraint.

Particularly striking is the great diversity of big bristly Tachinini – the so called “hedgehog flies”. These flies display a diversity of color patterns; e.g., orange, orange and black (Figs. 7A-C, Fig. 13E,F), yellow and black, black and white, and so on, and each of these color syndromes is represented by multiple, sometimes unrelated species – even crossing tribal boundaries into the Polideini and other tribes. I have been interested in these hedgehog flies, particularly the palpi-lacking clade “Epalpini”, for some time and I am attempting to obtain funding for focused studies on their diversity, ecology, and relationships in the tropical Andes. Perhaps even more impressive in terms of diversity (if not diversity of color pattern) are the Blondeliini (Figs. 7E, 14B,C,E,G). This tribe of mostly smaller tachinids tends to be pretty diverse nearly everywhere (i.e., across biogeographic regions and habitats), but they really dominate the fauna in the middle elevation Andes.

Figure 5. A trail near the San Isidro lodge along which many tachinids were collected.

Figure 6. A view of the cloud forest from Guacamayos ridge (near San Isidro) looking southeast towards the Amazon Basin.

Guacamayos ridge (28 June) 2247 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Exoristinae	Blondeliini	*Italispidea* sp. 2B2	0	1	1	could be = sp. 2B
Tachininae	Polideini	*Chrysotachina* n. sp. *sensu* Perilla-López,	0	1	1	
San Isidro lodge (30 June – 2 July) 2084 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Dexiinae	Voriini	*Campylocheta* sp. 1	1	0	1	
Dexiinae	Voriini	*Campylocheta* sp. 3	1	0	1	
Dexiinae	Voriini	*Campylocheta* sp. 5	0	1	1	assuming = male from Guango
Dexiinae	Voriini	*Cyrtophleba* sp. 1	1	0	1	
Dexiinae	Voriini	*Neotrafoiopsis* (?) cf. *andina*? Townsend	2	6	8	possibly *Trafoia*
Dexiinae	Voriini	*Polygaster* sp. 1	4	0	4	
Dexiinae	Voriini	*Trafoia* sp. 2A	0	1	1	possibly female of sp. 2B?
Exoristinae	Blondeliini	*Anoxynops* sp. 1	4	1	5	
Exoristinae	Blondeliini	*Anoxynops* sp. 2	1	0	1	
Exoristinae	Blondeliini	*Blondelia* sp. 1	0	1	1	
Exoristinae	Blondeliini	G. nr. *Myiopharus* sp. 1	0	2	2	
Exoristinae	Blondeliini	G. nr. *Oxynops* sp. 1	0	3	3	nr. *Myiopharus*? probably not *Oxynops*
Exoristinae	Blondeliini	*Calodexia* sp. 1	0	1	1	
Exoristinae	Blondeliini	*Calolydella* sp. 2	1	0	1	
Exoristinae	Blondeliini	*Calolydella* sp. 2a	0	2	1	could be = *C.* sp. 2?
Exoristinae	Blondeliini	*Calolydella* sp. 4	0	1	1	
Exoristinae	Blondeliini	*Calolydella* sp. 7	1	0	1	
Exoristinae	Blondeliini	*Calolydella*/*Lixophaga* sp. 5	1	0	1	3 presut. dorsocentrals, could be *Lixophaga*
Exoristinae	Blondeliini	*Chaetodoria conica*? Townsend	2	0	2	
Exoristinae	Blondeliini	*Chaetostigmoptera* (or G. nr.) sp. 3	2	0	2	different genus?
Exoristinae	Blondeliini	*Chaetostigmoptera* sp. 4	1	0	1	
Exoristinae	Blondeliini	*Cryptomeigenia* (or G. nr.) sp. 1	1	1	2	possibly very odd *Vibrissina*?
Exoristinae	Blondeliini	*Erythromelana* (or G. nr.) sp. 1	0	1	1	doesn't quite fit
Exoristinae	Blondeliini	*Erythromelana* cf. *napensis* Inclán	3	1	4	
Exoristinae	Blondeliini	*Erythromelana cryptica* grp. Inclán	0	2	1	unsure of species
Exoristinae	Blondeliini	*Erythromelana eois* Inclán	0	1	1	

Exoristinae	Blondeliini	*Erythromelana jaena* Inclán	1	0	1	
Exoristinae	Blondeliini	*Erythromelana* sp. nr. *abdominali*s Inclán	0	2	2	
Exoristinae	Blondeliini	*Erythromelana* sp. nr. *woodi* Inclán	0	1	1	entirely black
Exoristinae	Blondeliini	*Erythromelana woodi* Inclán	1	0	1	
Exoristinae	Blondeliini	*Eucelatoria tenella* grp. sp. 1	1	2	3	male could be diff.
Exoristinae	Blondeliini	G. nr. *Calolydella* sp. 1	2	0	2	
Exoristinae	Blondeliini	G. nr. *Calolydella* sp. 1a	0	1	1	differently marked but probably same as sp. 1
Exoristinae	Blondeliini	G. nr. *Eucelatoria* sp. 1	1	0	1	seems like *Blondelia* grp. Not *Eucelatoria*. Bristled facial ridge & hairy eyes.
Exoristinae	Blondeliini	*Hypoproxynops* sp. 1	0	4	4	
Exoristinae	Blondeliini	*Hypoproxynops* sp. 2	6	0	6	
Exoristinae	Blondeliini	*Hypoproxynops* sp. 3	1	1	2	
Exoristinae	Blondeliini	*Italispidea* sp. 1A	0	3	3	could = *I.* sp. 1?
Exoristinae	Blondeliini	*Italispidea* sp. 4	0	1	1	
Exoristinae	Blondeliini	*Italispidea* sp. 5	0	1	1	or G. nr.
Exoristinae	Blondeliini	*Italispidea* sp. 6	2	0	2	possibly different spp.
Exoristinae	Blondeliini	*Italispidea* sp. 7	1	0	1	
Exoristinae	Blondeliini	*Italispidea* sp. 8	1	0	1	
Exoristinae	Blondeliini	*Italispidea* sp. 10	1	0	1	
Exoristinae	Blondeliini	*Leptostylum* sp. 2	0	2	2	
Exoristinae	Blondeliini	*Lixophaga*/G. nr. *Anoxynops* sp. 1	0	1	1	not *Anoxynops*, possibly nr. *Lixophaga* cf. *L*. sp. 4)
Exoristinae	Blondeliini	*Lixophaga* sp. 2	1	1	2	
Exoristinae	Blondeliini	*Lixophaga* sp. 3	1	1	2	
Exoristinae	Blondeliini	*Lixophaga* sp. 4	0	5	5	
Exoristinae	Blondeliini	*Lydellothelaira*? sp. 1	1	0	1	(*Myiopharus*? *Thelyoxynops*?)
Exoristinae	Blondeliini	*Lydellothelaira*? sp. 2	0	1	1	(*Myiopharus*? *Thelyoxynops*?) could be = sp. 1 but differs in ab. & wing coloration
Exoristinae	Blondeliini	*Lydinolydella* sp. 2	3	1	4	
Exoristinae	Blondeliini	*Lydinolydella*/ *Euthelyconychia*? sp. 1	0	1	1	or *Myiopharus*?
Exoristinae	Blondeliini	*Myiopharus* sp. 1	0	2	2	no piercer
Exoristinae	Blondeliini	*Myiopharus* sp. 2	0	1	1	no piercer
Exoristinae	Blondeliini	*Myiopharus* sp. 3	0	3	3	>1 sp?
Exoristinae	Blondeliini	*Myiopharus* (?) sp. 4	0	1	1	nearly bare eyes, bare facial ridge

Exoristinae	Blondeliini	*Myiopharus* (?) sp. 5A	0	1	1	nearly bare eyes, bare facial ridge; 5A and B close, differ in color
Exoristinae	Blondeliini	*Myiopharus*? sp. 5B	0	1	1	nearly bare eyes, bare facial ridge
Exoristinae	Blondeliini	*Myiopharus* sp. 7	3	5	8	
Exoristinae	Blondeliini	*Myiopharus* (?) sp. 8	0	1	1	eye almost bare, gena thin, possibly diff. genus
Exoristinae	Blondeliini	*Myiopharus* sp. 13	1	0	1	
Exoristinae	Blondeliini	*Opsomeigenia*? (or *Eucelatoria*?) sp. 1	1	0	1	
Exoristinae	Blondeliini	*Phyllophilopsis* sp. 1	2	0	2	
Exoristinae	Blondeliini	*Phyllophilopsis* sp. 2	1	0	1	
Exoristinae	Blondeliini	Unk. G. nr. *Phyllophilopsis* #2 sp. 1	3	0	3	
Exoristinae	Blondeliini	*Ptilodegeeria* (?) sp. 1	1	0	1	or *Eucelatoria*?
Exoristinae	Blondeliini	*Sphaerina*? sp. 1	1	0	1	
Exoristinae	Blondeliini	*Vibrissina* (?) sp. 1	1	0	1	
Exoristinae	Eryciini	*Carcelia* (cf. *Calocarcelia*) sp. 1	5	1	6	
Exoristinae	Eryciini	*Carcelia* sp. 3	0	2	2	
Exoristinae	Goniini	*Chaetogaedia* (?) sp. 1	2	0	2	
Exoristinae	Goniini	*Chrysoexorista* sp. 2	1	2	3	
Exoristinae	Goniini	*Chrysoexorista* sp. 3	3	0	3	
Exoristinae	Goniini	*Gaediopsis* sp. 1	1	2	3	
Exoristinae	Goniini	*Gaediopsis* sp. 2	4	3	7	
Exoristinae	Goniini	*Leschenaultia* cf. *ciliata* (Macquart)	3	0	3	
Exoristinae	Goniini	*Leschenaultia* sp. nr. *currani* Toma & Guimaraes	1	2	3	
Exoristinae	Goniini	*Patelloa* sp. 1	2	2	4	
Exoristinae	Goniini	*Patelloa* sp. 2	0	1	1	
Exoristinae	Goniini	Unk. G. nr. *Aplomyodoria* sp. 1	1	0	1	
Exoristinae	Winthemiini	*Winthemia* sp. 2	0	1	1	
Tachininae	Graphogastrini	*Phytomyptera* sp. 1	1	0	1	
Tachininae	Minthoini	*Actinochaeta* sp. 1	0	1	1	
Tachininae	Minthoini	*Paradidyma* sp. 2	0	1	1	
Tachininae	Minthoini	*Paradidyma* sp. 3	2	2	4	
Tachininae	Nemoraeini	*Xanthophyto* n. sp. 1	1	0	1	revision of genus in progress by author
Tachininae	Nemoraeini	*Xanthophyto* n. sp. 2	1	0	1	revision of genus in progress by author

Tachininae	Polideini	*Chrysotachina* n. sp. *sensu* Perilla-López, unpub. Ph.D. thesis	1	1	2	
Tachininae	Polideini	*Ecuadorana* cf. *bicolor* Townsend	3	1	4	
Tachininae	Polideini	*Ecuadorana* nr. *bicolor* sp. 2 Townsend	1	0	1	
Tachininae	Polideini	*Ecuadorana* n. sp. 3	0	1	1	bluish sp.
Tachininae	Polideini	*Hystricia* n. sp. 2	1	1	2	
Tachininae	Tachinini ("Dejeaniini")	*Eudejeania* cf. *andeana* Sabrosky	1	0	1	probably this sp.
Tachininae	Tachinini ("Dejeaniini")	*Eudejeania* sp. nr. *melanax* (Walker)	0	1	1	possibly this sp.
Tachininae	Tachinini ("Dejeaniini")	*Eulasiopalpus* cf. *albipes* (Townsend)	0	1	1	
Tachininae	Tachinini ("Dejeaniini")	*Eulasiopalpus* sp. nr. *typicus* Curran	0	1	1	could be *E. typicus* – but seems grayer
Tachininae	Tachinini ("Dejeaniini")	*Jurinia* sp. 1	1	0	1	
Tachininae	Tachinini ("Dejeaniini")	*Oharamyia* n. sp. 1	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Anepalpus* (?) sp. 1	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Copecrypta* sp. 1	2	1	3	
Tachininae	Tachinini ("Epalpini")	*Cryptopalpus* sp. 1	0	1	1	"*Euquadratosoma*" grp.
Tachininae	Tachinini ("Epalpini")	Unk. genus 1 sp. 1	0	3	3	could be *Anepalpus* or *Lindigepalpus*
Tachininae	Tachinini ("Epalpini")	*Trichosaundersia* cf. *lineata* (sp. 2) Townsend	0	1	1	diff. than sp. 1. G. prob. = *Epalpus*
Tachininae	Tachinini ("Epalpini")	*Trichosaundersia* cf. *rufopilosa* Wulp	3	14	17	G. prob. = *Epalpus*
Tachininae	Tachinini ("Epalpini")	*Epalpus*/*Parepalpus* sp. 1	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 3	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 3A	1	0	1	possibly m. of sp. 3 but differs in several traits.
Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 4	3	3	6	variable, could be > 1 sp.
Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 4A	0	2	2	possibly = sp. 4
Tachininae	Tachinini ("Epalpini")	*Epalpus* or nr. sp. 5	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 6	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Epalpus sp*. 6A	0	2	2	distinct from sp. 6, possible 2 spp.

Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 7	6	7	13	possibly >1 sp.
Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 8	1	3	4	
Tachininae	Tachinini ("Epalpini")	*Epalpus*/*Parepalpus* sp. 9	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 10	2	4	6	
Tachininae	Tachinini ("Epalpini")	*Epalpus* sp. 11	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Epalpus* (?) sp. 12	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Epalpus* (?) sp. 13	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Eucorpulentosoma* (?) sp. 1	0	1	1	
Tachininae	Tachinini ("Epalpini")	G. nr. *Lindigepalpus* (?) sp. 1	1	0	1	keys to *Lindigepalpus* in Wood & Zumbado
Tachininae	Tachinini ("Epalpini")	*Lindigepalpus* (?) sp. 1	1	1	2	m. seems like *Lindig.* f. similar to *Epalpellus*
Tachininae	Tachinini ("Epalpini")	*Lindigepalpus* sp. 2	4	2	6	
Tachininae	Tachinini ("Epalpini")	*Parepalpus* sp. 2	4	2	6	"*Oxapampoepalpus*" grp., could be *P. auroanalis*?
Tachininae	Tachinini ("Epalpini")	*Quadratosoma*/ *Homosaundersia* (?) sp. 1	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Quadratosoma*/ *Camposiana* sp. 2	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Rhachoepalpus andinus* Townsend	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Rhachoepalpus* cf. *nova* Curran	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Rhachoepalpus* sp. nr. *blandus* Curran	2	0	2	
Tachininae	Tachinini ("Epalpini")	*Trichophora* cf. *tegulata* (Townsend)	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Trichophora* sp. 2	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Trichophora* sp. 3	1	0	1	
Tachininae	Tachinini ("Epalpini")	*Xanthoepalpus* sp. 1	0	1	1	
Tachininae	Tachinini ("Epalpini")	*Xanthoepalpus* (or *Xanthoepalpodes*) sp. 2	0	3	3	probably = *Xanthoepalpodes*, but genus prob. a syn. of *Xanthoepalpus*

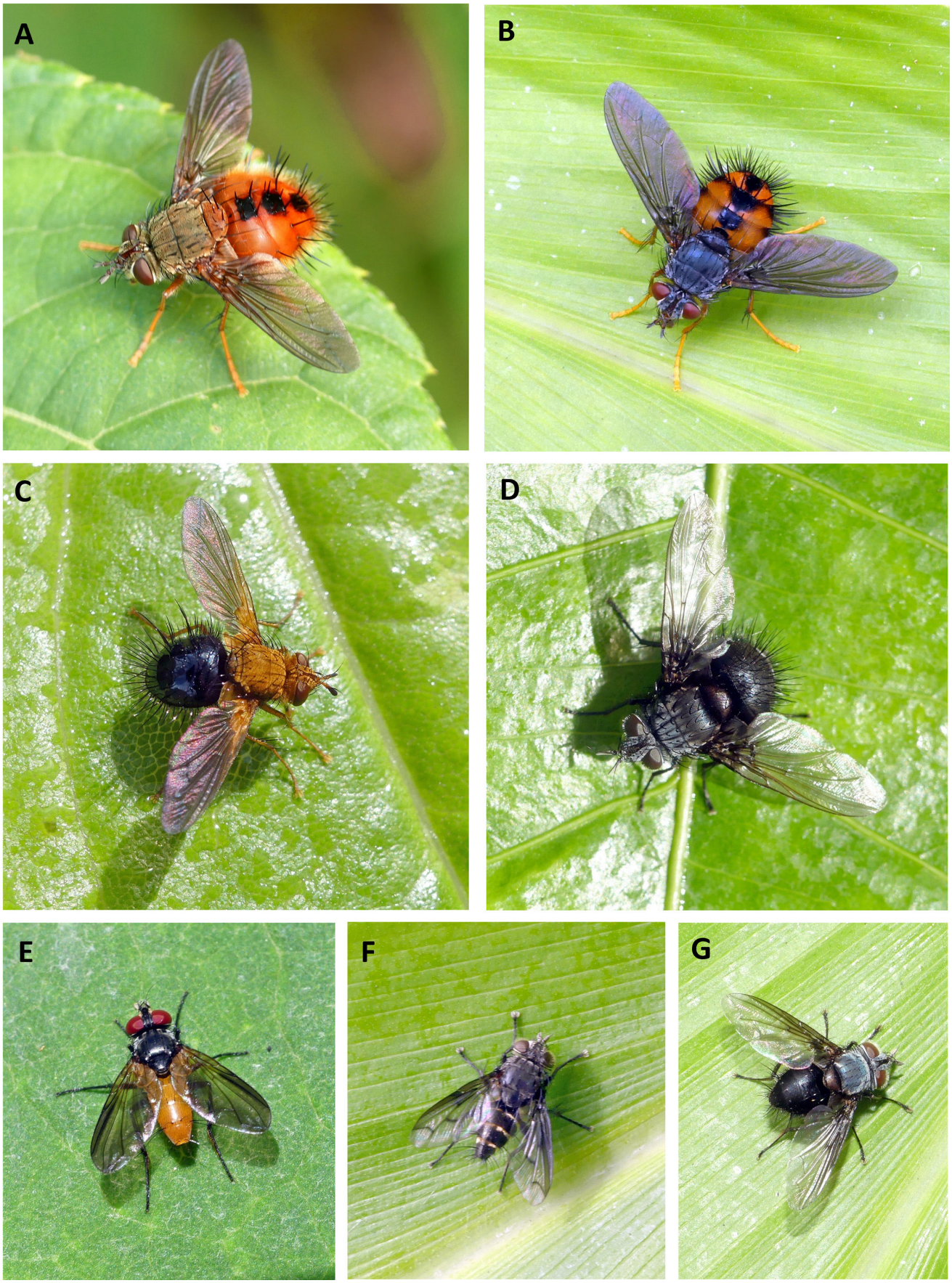

Figure 7. Examples of tachinids observed at San Isidro on foliage sprayed with a sugar solution. **A.***Trichosaundersia* (?) sp. (Tachinini), **B**. *Epalpus* or possibly *Eulasiopalpus* sp. (Tachinini), **C**. *Epalpus* sp. (Tachinini), **D**. *Leschenaultia* sp. (Goniini), **E**. *Erythromelana* sp. (Blondeliini), **F**. *Cyrtophloeba* (Voriini), **G**. *Carcelia*/*Calocarcelia* (?) sp.

The Andean foothills - La Brisa and Narupa

We made a few stops at slightly lower elevations in the Andean foothills (between 1500 and 2000 m) where I was able to spend an hour or two collecting. The weather was generally overcast, but it was warm and bright enough for some tachinid species to be out and about. The first was a brief stop at a private birding reserve called La Brisa (1865 m), well known for its hummingbird feeders. This was one of the few places I was able to collect tachinids from flowers due to a dense stand of planted *Verbena*, though only a few specimens were taken from these flowers. Most were simply collected from foliage. Later, we stopped by Narupa Reserve (1690 m) for a couple hours on our way to the lowlands. This ca. 2000-acre reserve was established by the nonprofit Jocotoco Foundation as a buffer area next to Sumaco National Park. Most of our time was spent hiking along a nice trail loop through the forest, but I was able to spend a little time collecting flies on a small hilltop near the road. It wasn't great collecting, but I was able to collect a number of species of Blondeliini and Voriini, as well as some probably undescribed *Cholomyia* species.

Figure 8. View from a small hilltop at Narupa Reserve in the lower Andean foothills.

La Brisa (27 June) 1865 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Exoristinae		*Italispidea* sp. 3	0	1	1	similar to *I.* sp. 2c
Exoristinae		*Lydinolydella* sp. 2	1	0	1	
Exoristinae		*Medina* sp. 1	0	1	1	
Exoristinae	Eryciini	*Carcelia* sp. 1	1	0	1	"*Calocarcelia*"?
Exoristinae	Eryciini	*Carcelia* sp. 2	2	0	2	

Exoristinae	Goniini	*Hyphantrophaga* sp. 2	2	0	2	
Tachininae	Tachinini ("Epalpini")	*Trichosaundersia* cf. *rufopilosa* Wulp	0	1	1	smaller than others, no presut. acrostichals
Narupa Reserve (28 June) 1690 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Dexiinae	Voriini	*Campylocheta* sp. 2	1	0	1	
Dexiinae	Voriini	*Trafoia* sp. 1	1	0	1	
Dexiinae	Voriini	G. nr. *Cyrtophleba* sp. 2	1	0	1	
Exoristinae	Blondeliini	*Actinodoria* sp. 1	0	1	1	
Exoristinae	Blondeliini	G. nr. *Lixophaga* (or *Anisia*?) sp. 1	0	1	1	rotund abdomen
Exoristinae	Blondeliini	Unk. G. nr. *Anisia*? *Chaetona*? sp. 1	0	1	1	parafacial diff. than *Anisia*, rotund ab.
Exoristinae	Blondeliini	*Calolydella* sp. 3	1	0	1	possibly = *C.* sp. 2 but shape/color diffs.
Exoristinae	Blondeliini	*Chaetodoria* ?*conica* Townsend	0	1	1	
Exoristinae	Blondeliini	*Eucelatoria dimmocki* grp. sp. 2	0	1	1	
Exoristinae	Blondeliini	G. nr. *Lixophaga* sp. 1	0	1	1	similar to *Erythromelana* but many traits diff.
Exoristinae	Blondeliini	*Italispidea* sp. 1	3	5	8	could be >1 sp.
Exoristinae	Blondeliini	*Myiopharus* sp. 10	0	1	1	
Exoristinae	Blondeliini	*Myiopharus* sp. 12	0	1	1	
Tachininae	Graphogastrini	*Phytomyptera* sp. 2	0	1	1	
Tachininae	Tachinini ("Dejeaniini")	*Oharamyia* cf. *vierecki* (Curran)	0	1	1	
Unplaced	Myiophasiini	*Cholomyia* n. sp. 1	0	1	1	
Unplaced	Myiophasiini	*Cholomyia* n. sp. 2	0	1	1	or G. nr., unlike other *Cholomyia* spp.

Lowland Tropical Forest

El Oriente – Amazon Basin

We eventually made it down to the Amazon Basin proper and took some long, motorized canoes (Fig. 9) to visit an indigenous Quechuan village and a wildlife rehabilitation center (AmaZoonico). I generally did not have opportunities to collect flies during this fascinating excursion to the lowlands, but I was able to opportunistically grab a few specimens while we were being served a local meal near the edge of the Napo river. In addition, on our way back to the uplands we stopped at an impressive and beautiful waterfall on the Río Hollín (see Fig. 1), where I managed to collect a couple females of *Lixophaga* (probably).

Figure 9. Our transportation mode on the Napo river in the Amazon Basin (near Ahuano).

Río Napo – nr. Ahuano (28 June) 403 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Dexiinae	Dexiini	*Billaea* sp.	1	0	1	or G. nr., small body
Exoristinae	Blondeliini	*Lixophaga*/ *Chaetostigmoptera*? sp. 1	0	1	1	Genus? divergent lat. scut. setae like *Anoxynops*
Unplaced	Myiophasiini	*Cholomyia* cf. *inaequipes* Bigot	1	0	1	
Cascada del Río Hollín (28 June) 1036 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Exoristinae	Blondeliini	*Lixophaga*? sp. 6	0	2	2	"*Plaxactia*" grp.?

La Costa - West Andean foothills and Coastal lowlands

Near the end of my travels in Ecuador, I parted ways with the course. The students and professors went on to some cultural activities in Otavalo and Quito and I headed westward with Diego Inclán, who graciously offered to take me along to visit a couple lower sites on the west side of the Andes. The first place we visited was a cattle ranch, Betania farm, in the lower Andean foothills near the small town of Nanegalito (about 1400 m; Fig. 10). The owner of the farm was interested in preserving some of the forested parts of his land for biodiversity, and Diego, as director of Ecuador's biodiversity institute, was advising him. I should note that our hosts at Betania farm were extremely generous feeding us and putting us up for the night. The forested areas of Betania farm were located on very steep and difficult to access slopes. However, we were able to do a little collecting one morning along a dirt road running through the property. Nearly everything we collected belonged to the Exoristinae, including several *Vibrissina* species, an interesting Masiphyini species, and a large black *Patelloa*-like species similar in its robust size and bristly hedgehog fly habitus to the species that I collected at high elevation near Volcán Antisana (Figs. 13C,D).

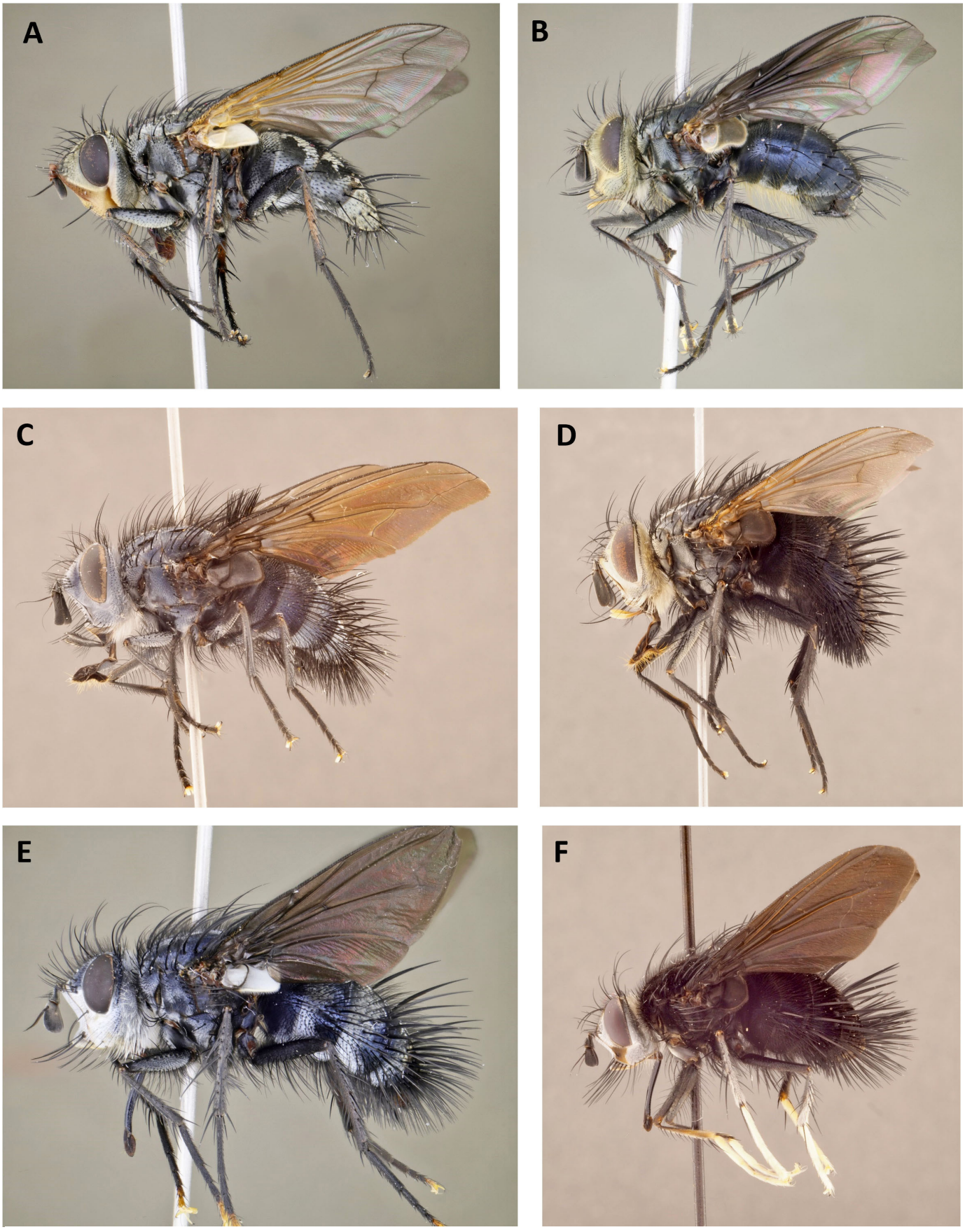

Figure 13. Some of the interesting tachinids that I collected in Ecuador. **A**. *Microphthalma* nr. *cuzcana* Townsend (♀, Antisana; Megaprosopini). **B**. *Trafoia* sp. 2 (♂, Guango; Voriini). **C**. *Patelloa* sp. or g.nr. (♀, Antisana; Goniini). **D**. *Patelloa* sp. or g.nr. #2 (♀, Betania farm; Goniini). **E**. *Trichophora* cf. *tegulata* (Townsend) (♂ San Isidro; Tachinini). **F**. Epalpini, unk. G. (*Anepalpus*? *Vibrissoepalpus*?) (♀, San Isidro; Tachinini). Images are not to scale.

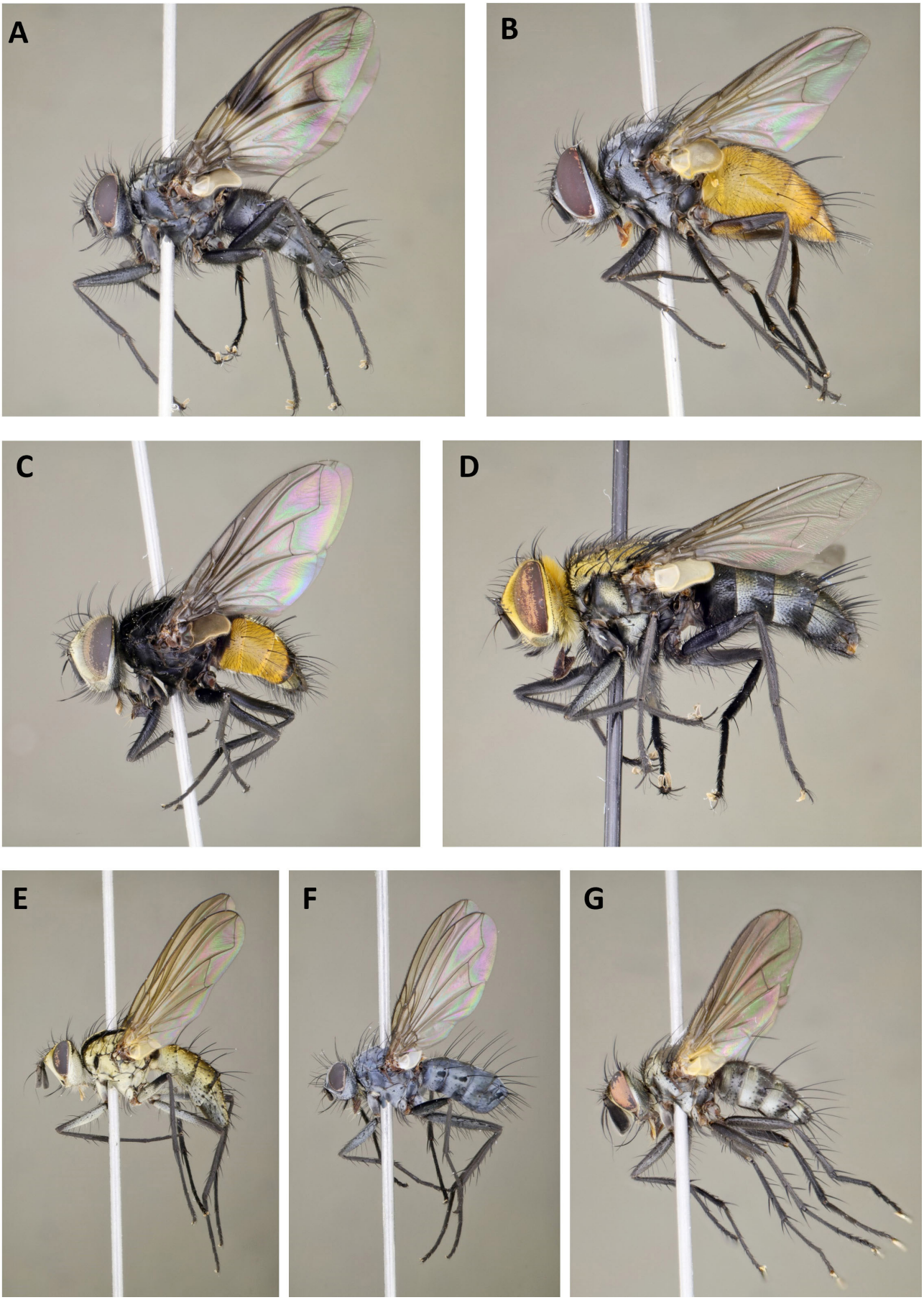

Figure 14. Interesting tachinids that I collected in Ecuador, continued. **A**. G. nr. *Lydinolydella* sp. (♂, Guango; Blondeliini). **B**. *Hypoproxynops* sp. (♂, San Isidro; Blondeliini). **C**. *Myiopharus* sp. (♂, San Isidro; Blondeliini). **D**. *Triodontopyga* sp. nr. *flavolimbiata* (Bigot) (♂, Chontaloma; Winthemiinii). **E**. *Calolydella* sp. (♀, San Isidro; Blondeliini). **F**. *Leptomacquartia*? sp. (♀, Guango; Blondeliini – this species strongly resembles a rhinophorid). **G**. *Italispidea* sp. (♂, San Isidro). Images are not to scale.

After leaving Betania farm, we drove down to western lowland tropical forest in the vicinity of the town of Mashpi. Apparently, there is a very high-end hotel/resort in Mashpi that the rich and famous frequent. Being neither of those things, we stayed instead at a small farm/forest reserve called Chontaloma (Fig. 11; a much preferable place to stay in my opinion). Reserva Chontaloma is run by a delightful couple, Arturo and Paola, who provided us a cabin to stay in and all of our meals – which were largely derived from products of their small organic farm and neighboring eco-agricultural farms – for a very reasonable price. Diego and I were able to spend a morning collecting along a trail in the reserve. We were able to collect females of four species of *Calodexia* (parasitoids of cockroaches and followers of army ant swarms; Curran 1934, Rettenmeyer 1961), all in the same area. Our collection was again dominated by Exoristinae, with a good representation of Goniini. It is my impression that Goniini and Eryciini (as well as Winthemiini; Fig. 14D) constitute a greater proportion of the bristle fly fauna at lower elevations in the Neotropics, although Blondeliini appear to be abundant and diverse at all elevations.

Nanegalito, Betania farm (4 July) 1380 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Dexiinae	Voriini	*Arrhinactia* sp. 1	1	0	1	
Dexiinae	Voriini	*Voria* cf. *erasmocoronadoi* Fleming & Wood	1	0	1	
Exoristinae	Blondeliini	G. nr. *Eucelatoria*? sp. 1	1	0	1	does not seem like *Eucelatoria* but possibly?
Exoristinae	Blondeliini	G. nr. *Phyllophilopsis* sp. 1	1	0	1	prob. not *Phyllophilopsis*, unclear what it is
Exoristinae	Blondeliini	*Leptostylum* sp. 1	0	2	2	
Exoristinae	Blondeliini	*Lixophaga* (?) sp. 7	1	0	1	Possibly *Eucelatoria*
Exoristinae	Blondeliini	*Myiopharus* sp. 11	1	0	1	
Exoristinae	Blondeliini	*Myiopharus* sp. 14	0	1	1	
Exoristinae	Blondeliini	*Thelyoxynops* (or G. nr.) sp. 1	1	0	1	
Exoristinae	Blondeliini	*Vibrissina* sp. 1	5	1	6	
Exoristinae	Blondeliini	*Vibrissina* sp. 2	0	1	1	
Exoristinae	Blondeliini	*Vibrissina* sp. 3	0	1	1	
Exoristinae	Blondeliini	*Vibrissina* sp. 3a	0	2	2	could be = sp. 3, but I think distinct
Exoristinae	Eryciini	*Carcelia* sp. 4	0	2	2	
Exoristinae	Eryciini	*Casahuiria* sp. 1	0	2	2	
Exoristinae	Eryciini	*Drino* sp. 1	0	2	2	
Exoristinae	Eryciini	*Drino* sp. 2	1	0	1	
Exoristinae	Goniini	G. nr. *Patelloa* #2 sp. 1	0	1	1	
Exoristinae	Goniini	*Leschenaultia* sp. 3	0	1	1	
Exoristinae	Goniini	Unk. G. nr. *Pseudochaeta*? sp. 1	0	2	2	

Exoristinae	Masiphyini	*Masiphya*/ *Mystacomyoidea* sp. 1	0	1	1	roughly keys to *Phasiopsis* (*Masiphya*) but female unknown. Female terminalia match *Mystacomyoidea.*
Exoristinae	Winthemiini	*Winthemia* sp. 4	1	0	1	
Tachininae	Polideini	*Chrysotachina* sp. 2	0	1	1	

Figure 10. Diego Inclán at Betania farm with steep forested slopes in the background.

Figure 11. Eco-agroforestry reserve Chontaloma main building, where we took our meals.

Reserva Chontaloma (5 July) 560 m						
Subfamily	**Tribe**	**Species**	**M**	**F**	**Tot**	**Notes**
Dexiinae	Dufouriini	*Cenosoma* n. sp.	1	0	1	
Dexiinae	Voriini	*Arrhinactia* sp. 2	1	0	1	
Exoristinae	Blondeliini	G. nr. *Chaetostigmoptera* sp. 1	0	1	1	
Exoristinae	Blondeliini	*Calodexia* cf. *fumosa* (Townsend)	0	5	5	
Exoristinae	Blondeliini	*Calodexia* sp. nr. *bella* Curran	0	1	1	
Exoristinae	Blondeliini	*Calodexia* sp. nr. *caudata* Curran	0	1	1	
Exoristinae	Blondeliini	*Calodexia* sp. nr. *similis* (Townsend)	0	1	1	

Exoristinae	Blondeliini	*Eucelatoria nana* grp. sp. 4	0	1	1	
Exoristinae	Blondeliini	G. nr. *Polygaster* sp. 1	0	1	1	
Exoristinae	Blondeliini	*Leptostylum* sp. 1	0	1	1	
Exoristinae	Blondeliini	*Lixophaga* G. nr. *Anoxynops* sp. 2	0	1	1	might not be *Lixophaga* - has *Anoxynops*-like scut. setae (see *Anoxynops* G. nr.)
Exoristinae	Blondeliini	*Lixophaga* sp. 1	2	2	4	male ab. pollinosity totally diff. could be diff. spp.
Exoristinae	Blondeliini	*Myiopharus* sp. 6	0	1	1	
Exoristinae	Blondeliini	*Sphaerina* (G. nr. 2) sp. 3	0	1	1	
Exoristinae	Blondeliini	*Thelyoxynops* sp. 1	0	3	3	
Exoristinae	Eryciini	*Carcelia* sp. 5	0	1	1	
Exoristinae	Eryciini	*Drino* sp. 1	0	1	1	
Exoristinae	Exoristini	*Austrophorocera* sp. 1	1	0	1	
Exoristinae	Goniini	*Chrysoexorista* sp. 1	0	1	1	
Exoristinae	Goniini	*Houghia* sp. 1	0	1	1	
Exoristinae	Goniini	*Houghia* sp. 2	0	1	1	could = sp. 1, but color diffs.
Exoristinae	Goniini	*Houghia* sp. 3	0	1	1	
Exoristinae	Goniini	*Hyphantrophaga* sp. 1	0	1	1	
Exoristinae	Goniini	*Leschenaultia* sp. 3	0	1	1	
Exoristinae	Winthemiini	*Triodontopyga* sp. nr. *flavolimbata* (Bigot)	7	1	8	
Exoristinae	Winthemiini	*Winthemia* sp. 3	0	1	1	

Figure 12. A Schmidt box containing most of the tachinid specimens collected during my trip (along with a few other odds and ends).

Discussion

Over all locations and collecting events, 479 tachinid specimens were collected (218 males and 261 females; Fig. 12). Again, all of these were collected by hand, and the majority came from one site, San Isidro. The total number of estimated species ranges from a "liberal" 244 (including all morphospecies suspected of being distinct) to a more conservative 236 (lumping similar recognizable "forms" together). Of course, the true number of species may be greater if there are many morphologically cryptic species, or lower if there is a lot of morphological variation within genetically cohesive species. I should note that based on current catalog information, only 99 named species are documented to occur in mainland Ecuador (O'Hara & Henderson 2022) (even though Stireman et al. 2017 reared 279 morphospecies from Lepidoptera). Almost two-thirds of species (61.9%) were represented by only a single specimen, and few species (8%) were represented by five or more specimens (Fig. 15). Such a distribution of species abundances indicates that I likely only collected but a fraction of the species occurring in the areas surveyed, even at the locations where I was able to collect many specimens. For example, rarefaction analysis of the San Isidro collections, where most specimens were collected (N=294), indicates a high, non-asymptotic slope of species richness against individuals collected, and extrapolation suggests that had I collected 500 specimens in total, I could expect to encounter an additional 45 species or so (Fig. 16).

As mentioned previously with respect to particular sites, the tachinid faunal composition was dominated by Exoristinae, which represented about two thirds of specimens and species (Fig. 17). However, it should be kept in mind that my collections are not a random sample of tachinids present in the sites and habitats visited and are likely biased in a number of ways. My collecting was focused on diurnal species that frequent forest edges at low heights. The fauna could be quite different up in the forest canopy. Furthermore, I often used a sugar solution sprayed on leaves to attract or at least "arrest" flies, and my collections are thus probably biased towards species that are attracted to or utilize honeydew on leaves, rather than obligate flower visitors. It was also probably biased against smaller, less noticeable taxa, and I was somewhat partial to collecting Tachinini where they were present. With these caveats in mind, I examine some of the observed patterns of taxon diversity and abundance.

Blondeliini dominated the tachinid fauna, accounting for nearly half of all specimens and species (Fig. 17). They were especially rich in the tropical montane forest and cloud forests at middle elevations where most of my collecting took place. At lower elevations, other exoristine clades such as Goniini and Eryciini were somewhat better represented, but Blondeliini was the richest tribe at every site in which I collected more than a handful of specimens. This tribe also posed the greatest difficulties with identification. There were many species that I could not place to genus, and many of my genus-level identifications are tentative. There appears to be a vast and largely unknown and undescribed fauna of this tribe in the Andes. The late Monty Wood made major advances in understanding this group in his revision of the North and Central American fauna (Wood 1985; also see Wood & Zumbado 2010), but there are many additional genera in South America that were not covered in this revision. I remember Monty telling me that many blondeliine genera that appear to be distinct at temperate latitudes are linked by intermediate forms in the tropics, blurring the boundaries between them. It is clear to me that an enormous and recent radiation of this tribe has occurred in South America, especially in the Andes. This radiation may be ongoing as evidenced by the many highly similar taxa and substantial variation within "species" that I observed. I collected many species of genera such as *Lixophaga*, *Myiopharus*, *Italisipidea*, *Calolydella*, and *Erythromelana* even within single sites (Figs. 7E, 14C,E,G). These genera are undoubtedly actively diversifying and each is probably represented by dozens if not hundreds of species in the Andes.

Tachininae were the second most abundant and diverse subfamily, largely due to the tribe Tachinini (Fig. 17). As indicated, these "hedgehog" flies were likely over-represented in my collections due to my interest in the group – but they are clearly fantastically diverse in the Andes. As with the Blondeliini, it is apparent that this tribe (particularly the "Epalpini" and "Dejeaniini" clades) has recently and explosively diversified in the Tropical Andean region and other higher elevations of the Neotropics, resulting in innumerable forms that have been split into dozens of genera. Only a handful of lineages from this great morass of Andean taxa have dispersed up through Central America and colonized temperate latitudes.

What is missing?

There were some notable deficiencies of certain taxa in my collections. Foremost is the complete lack of members of the subfamily Phasiinae. Of the 99 species currently cataloged as occurring in Ecuador, none are phasiines (O'Hara, pers. comm.). Although this should be taken as more an indication of our lack of knowledge than a true absence, I have collected relatively few phasiines in previous trips to Ecuador (with the notable exception of the odd genus *Neobrachelia*). Thus, the subfamily does appear to be poorly represented, at least in the Andean fauna. There are certainly plenty of heteropteran hosts available. Perhaps the phasiines tend to remain in the canopy? Dexiinae are another subfamily with relatively poor representation. I collected decent numbers and diversity of Voriini *sensu lato* (Fig. 17), although not as great a diversity as I expected based on previous experience (e.g., relatively few "Uramyini" and *Trafoia* spp.; Fig. 13B). But, what was really remarkable was the lack of Dexiini – this diverse tribe was represented by only a single specimen of *Billaea,* which was collected in the Amazon Basin lowlands. I do not believe that this reflects a true dearth of this tribe in the Andes. Rather, it was likely due to bias in my collecting methods. Dexiini may be more likely to be crepuscular, whereas most of my collecting was mid-morning or afternoon. Also, at least some taxa rest on tree trunks, whereas most of my collecting was focused on foliage. It is my guess that Dexiini are likely diverse in the lowlands and have reasonable diversity in the mid-elevation Andes, but this deserves further exploration.

I noted previously that the diverse and widespread genus *Winthemia* was uncommon in my collections, and this is also true of the somewhat similar tribe Exoristini. Only five species of Winthemiini and one of Exoristini were collected during my trip. I suspect that both of these tribes are much more diverse at lower elevations and their poor representation in my collections reflects the relative lack of collecting efforts in these areas. Another glaring deficiency is the Tachininae tribe Siphonini. I collected only a single species of *Siphona*. I believe that there are two reasons for this. First, I was not able to collect from flowers, and siphonines (as well as phasiines, see above) are major flower visitors. My previous experience net-sweeping from composite flowers at mid-elevations in the Andes suggests that the region harbors a quite rich fauna of siphonines, with dozens of undescribed species. The second reason is that they are small and are more likely to escape notice. This may also explain the relatively low number of species of other small bodied genera such as *Phytomyptera*, which are probably also highly diverse in the habitats visited.

A better understanding of the diversity and composition of the bristle fly fauna of Ecuador requires much more collecting in a wide variety of habitats and locations, as well as careful examination of specimens already present in collections. There is no question that Ecuador possesses a huge tachinid fauna and that most of it is undescribed. This limited, opportunistic survey and report, despite its biases and uncertainties, represents a small step towards illuminating this remarkable diversity.

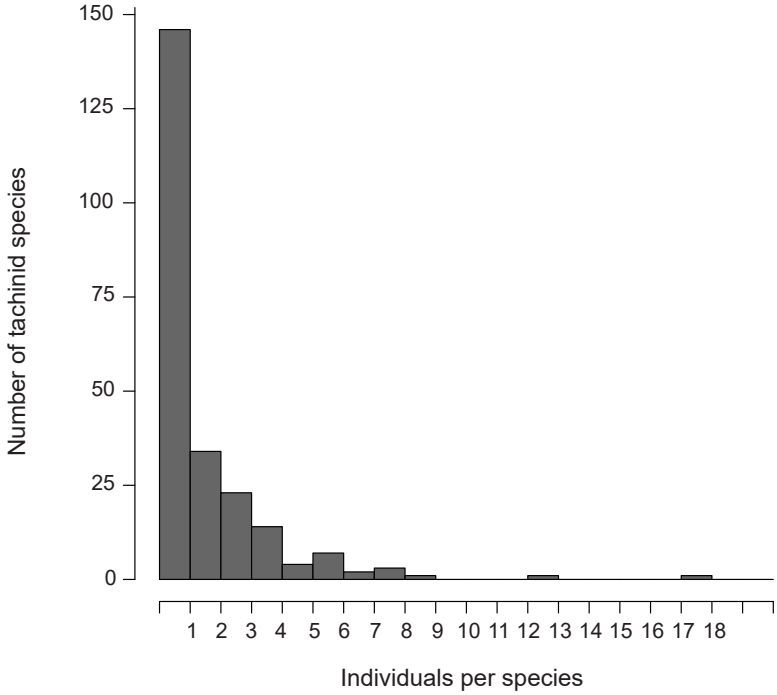

Figure 15. A species abundance distribution for all specimens that I collected in Ecuador. Note the large number of singletons.

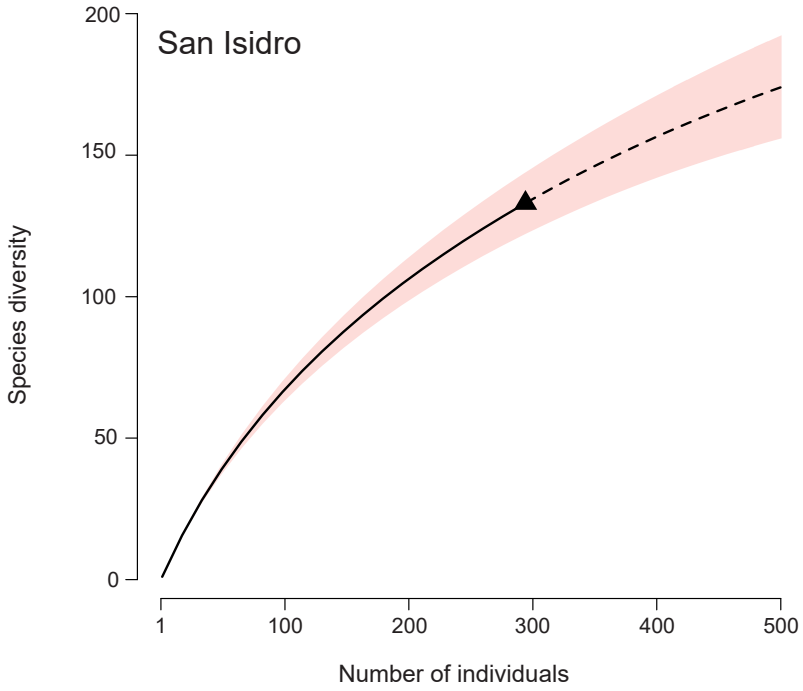

Figure 16. A species rarefaction curve for San Isidro, with extrapolated richness at 500 specimens. The black triangle marks the observed number of specimens and species. The colored area indicates 95% confidence limits.

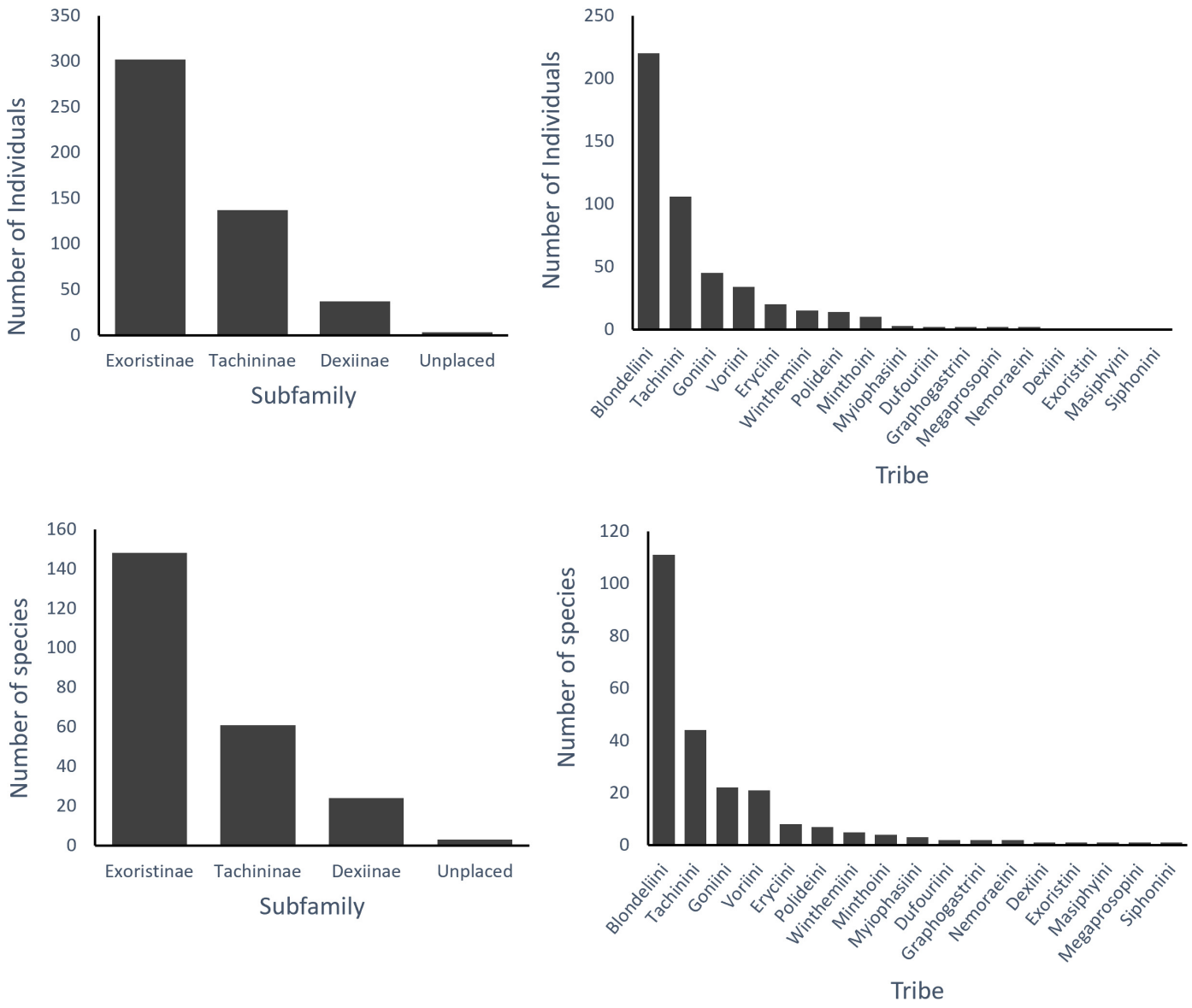

Figure 17. Abundance (top) and species richness (bottom) of tachinids collected in Ecuador according to subfamily (left) and tribe (right). Myiophasiini are considered to be unplaced as to subfamily.

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