

Notes on the Tipulidae of Ecuador

(Order Diptera)

Part I

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Dr. Roberto Leví-Castillo has been so kind as to invite me to contribute various papers concerning the rich crane-fly fauna of Ecuador. For this initial part I have prepared an account of the development of our knowledge of these insects and in further parts under this same title I hope to provide records of distribution, descriptions of new species, and in similar manner add to our still very insufficient knowledge of the exceptionally rich crane-fly fauna of this country. If the project develops to a point where it would appear that keys to the genera and species might be prepared this will be attempted but at the present moment our knowledge is still so insufficient that such keys to the various genera could be out-of-date almost before they appeared in press. It is anticipated that the future collecting of Dr. Leví-Castillo and his co-workers, together with materials available from other sources, might make such a project possible.

HISTORICAL DEVELOPMENT OF OUR KNOWLEDGE OF THE CRANE-FLIES OF ECUADOR

As far as known to me, no crane-flies were collected in Ecuador prior to the beginning of the present century. Between the years 1901 and 1905, the French Army Mission sent to the republic to measure one degree of arc on the equator, had as its naturalist and collector, Paul Rivet, who secured no fewer than 11 species of these flies, 8 being described as new by F. W. Edwards (Diptères Nématocères. Arc de méridien équatorial, 10 (2): 143—162, figs. 4—26; 1920). Mr. Edwards had informed me that his important paper was written in 1913,

was printed in 1914, but was not actually published until after the close of World War I in 1920. Most of these records pertain to the larger *Tipulidae* crane-flies and are from high altitudes in the Andes, chiefly above 3500 meters. Herbert S. Parish, veteran Canadian collector of insects in Tropical America, visited Ecuador in June 1914; after a brief stop in Guayaquil, he went into the mountains, finding excellent collecting at Huigra (4500 feet) and ascending as high as Alausí (9450) feet, before returning to Guayaquil and proceeding to Peru. For an account of his species and an itinerary of the trip, see Alexander (New or little-known crane-flies from Colombia, Ecuador and Perú (*Tipulidae, Diptera*). *Trans. Amer. Ent. Soc.*, 42: 1—32, 5 pls.; 1916). The present curator of mammals at the American Museum of Natural History, New York City, Dr. G. H. H. Tate, began his long years of field work in the spring of 1922 in Ecuador. While primarily interested in the vertebrates, he collected numerous insects, including various *Tipulidae*. Other early collections of minor importance were those of Richard Haensch, at Santa Inez (Hacienda Santa Ines, Tungurahua) in 1900, and of Friedrich Ohaus at Sabanilla in 1905 (both discussed by Enderlein, 1912). The earliest work of the distinguished national entomologist of Ecuador, Profesor Francisco Campos R. of the Colegio Nacional Vicente Rocafuerte, Guayaquil, likewise pertains to this period and was continued for nearly half a century. Only a few records of *Tipulidae* are included among the many entomological papers by this scientist (*Contribución al estudio de los insectos del Callejón Interandino. Revista Colegio Nacional Vicente Rocafuerte, &, Nos. 25—26, p. 40; 1926*). On page 6 of this report is a record of Ecuadorean altitudes of particular significance in entomology.

The “golden age” or period of our great development of knowledge of the vast crane-fly fauna of Ecuador began in the early 1920's, when William Clarke- Macintyre, of New Jersey, first went to the country (in 1922) in order to collect balata and certain groups of insects, chiefly for the Rothschilds of England, and including butterflies, hawk-moths and fleas. The country and its teeming insect fauna so appealed to Macintyre that he decided to spend his life there. He became acquainted with the veteran native collector, Elias Velastegui, in Baños, and later married one of the Velastegui daughters (Eloisa, at Baños, on July 7, 1936). Some of the children of Velastegui became outstanding collectors, particularly Eloisa, Rosario (now Mrs. Reuben

Lefebre, living at Baños), and Segundo. Further, some of Macintyre's own children, particularly Guillermina (born at Baños, 1937) and Donald (1942) are actively engaged as collectors at the present moment. Elias Velastegui began his collecting about 1882, or when he was only 16 years of age. About the turn of the century he was collecting insects for Richard Haensch, and from about 1906 on, for Henrich Feyer. He died on October 4, 1941, at the age of 75.

I first became acquainted with Macintyre in 1935, through Parish, receiving my first letter from him in January 1936. There followed many years of profitable friendship and correspondence. Macintyre for many years resided in Baños (1820 meters), at the foot of the volcano Tungurahua. This is located on the south bank of the Rio Pastaza and using this as a base, Macintyre made many trips into the surrounding higher country, including the Rio Blanco (200 meters), above Yungilla; El Tablon (2800 meters); Runtun, on the northeast shoulder of Tungurahua (2900 meters); Pundoa (3000 meters); and, on occasions, even to the paramo of Tungurahua, reaching the snow-line at about 4200 meters. Numerous interesting Tipulid records resulted from these trips. Going down the Rio Pastaza, between Baños and Mera (1100 meters) and Puyo (980 meters) Macintyre found his most interesting single location at Abitagua, formerly placed in the Oriente of Ecuador, now politically in the province of Napo-Pastaza.

Abitagua had been known to naturalists since 1857 when it was visited by the distinguished botanist, Richard Spruce (Notes of a Botanist on the Amazon and Andes; vol. 1: i—lii, 1—518, vol. 2: i—xii, 1—542, 71 illustrations; portrait, 7 maps; introduction by Alfred Russel Wallace; Macmillan Co., 1908). In Spruce's work, Abitagua is mentioned three times, two of the paragraphs being of particular interest.

"The cryptogamic vegetation of some parts of the Montaña of Canelos is wonderful. There is one mountain, called Abitagua, which though not more perhaps than 5000 feet high, is continually enveloped in mists and rains. The trees on it, even to the topmost leaves, are so thickly encased in mosses that a recognizable specimen of them would be scarcely procurable, if indeed they ever flower, which must be very rarely." — Vol. 2: 177.

"Perhaps never a day passes without rain on this mountain, and its summit is nearly always enveloped in mist, which looks as if it were permanently hung up in the trees. The trunks and branches of the latter, and often even the uppermost leaves, are densely enveloped in mosses. Various species of **Plagiochila**, **Mastigobryum**, **Phyllogonium**, **Bryoptera**., etc., hang from the branches to the length of one to three feet, and in such thick bunches that when saturated with rain they often break off even green branches by their weight. I have been told by the cargueros of Baños that when they pass with cargoes through the most mossy parts of the Montaña after much rain has fallen they step with constant dread of being crushed by some ruptured branch." — Vol. 2: 147.

Recognizing the extreme importance of Abitagua I secured fuller data from Macintyre and published these in some detail (Ann. Ent. Soc. America, 36: 103—104, 1943; 37: 298—299, 1944). Brown (Ann. Ent. Soc. America, 34: 814, 1941) writes of Abitagua as follows: "A famous 'secret' collecting station of Feyer and other profesional collectors on the north bank of Rio Pastaza. It is the first high ridge of the foot-hills of the eastern Andes as they rise from the Amazonian plain. The ridge is covered with a dense sub-tropical humid forest. The forests of the lower slopes are tropical". A considerable part of the Cerro Abitagua was purchased by Macintyre in 1938, with the expressed purpose of conserving it and its natural resources. Here he established the Hacienda Guillermina, the property extending along the Pastaza between the Rios Abitagua and Ergano, a distance of about 2 kilos, and some 2000 meters northward into the higher ground. The home was built between two small streams, the Rios Fox and Industrio, just above two small islands in the Pastaza, with the Baños-Mera trail passing close by home. From about 1936 to 1944, Macintyre and various members of the Velastegui family visited Abitagua, making extensive collections, and using it as a base for further trips deep into the Oriente, as to the Napo watershed, including the western branch, the Jatun Yacu (over three months, 1937), and to the Rio Arajuno and Upper Napo (approximately one year, 1941). Other outstanding trips away from Baños included six months in 1938 to the Playas de Montalvo (Los Rios), and three months in 1938 in Balzapamba (Bolivar). From October 1938 to February 1940, Macintyre served as Professor of Entomology, Head of the Department of Zoology, and Director of the Museum at

the Central University, Quito. The museum was in a run-down to virtually hopeless condition and since no funds became available for the maintenance of the collections, Macintyre felt obliged to resign from the work.

Late in 1944, Macintyre's health became impaired, chiefly though asthma and a minor heart condition, necessitating his removal to a lower altitude than Baños. He then went to Manabi where he purchased a small farm at Cojimies, virtually at sealevel, where he still resides (1952). He is still active as a collector, being assisted by his wife, Eloisa, and by his three children. Unfortunately, as regards the Tipulidae, The vicinity of Cojimies seems to be an unusually poor one and only a meager representation of species from the area has become available. There can be no question but that Macintyre and his assistants have added most to our knowledge of the crane-flies of Ecuador.

Frederick Martin Brown. The distinguished student of Lepidoptera, Profesor F. Martin Brown, of Colorado Springs, Colorado, with Mrs. H. H. Brown, and Dr. C. W. T. Penland, as botanist, spent some nine months in Ecuador in 1938 and 1939. The itinerary and some of the experiences of the party are well described in an account provided by Profesor Brown in "The Entomologist's Exchange News, vol. 3, no. 8; September 5, 1939", issued by the Cheyenne Mountain Museum, Colorado Springs, and this is used as a basis for discussing the important work accomplished by the party.

"We hit Guayaquil last September (1938) on about the first. We got the first train out, some three days later, that would take us up to Ambato, in the Central Valley of Ecuador. As you know, Ecuador is a little republic sitting astride the equator, about the size of Colorado, but with more ups and downs than we have here in the highest of the United States. On the west there is a coastal plain of hot, wet jungle land. This region is little known and almost unknown entomologically. We did nothing there, so it's a good place for someone else. The coastal plain attains an altitude of about 1000 feet. Then the mountains begin, 23,000 feet of them. Up they go to the highest point in the Americas, Chimborazo. We played around there quite a bit, in fact, spent the better part of a month on 'Chimbo' above tree-line. This ridge of mountains is known as the Cordille-

ra Occidental, and it drops quite as abruptly as it rose to the Central Valley. Most of the cities and valley bottoms are about 9000 feet. The land then shoots up again to the eastern ridge, the Cordillera Oriental. This is not quite so high, but high enough, 20,000 feet or so. This ridge takes about 40 kilometers to get down to 3000 feet and then you are in the great Amazonian plain and, as you know, that takes its time and in about 3000 miles manages to reach sea level.

"We based in an old town over on the eastern side of the mountains at the western end of the trail across South America. This is Baños. It is about four blocks square and built at the foot of the volcano Tungurahua on the edge of the canyon of the Rio Pastaza. If old 'Tungie' ever lets out a real grunt I'm afraid Baños will wind up in the drink. This is a region of temperate climate yet it is warm enough for bananas and other tropical fruits to grow. In our garden we had roses and bananas in bloom at same time.

"There are two clear cut seasons. From the middle of December to the middle of April it rains continually. The rest of the year it rains less frequently. The best collecting time is at the change of seasons.

"From Baños we journeyed forth down the river, following the old trail to the Atlantic, but we didn't go quite that far! We went to a point just about one days walk from the headwaters of navigation, the point where you can get a canoe, and if you have any luck, in 18 days be down to Iquitos, Peru, and the steamers for London or New York.

"We stayed down below there just outside Puyo, a dozen or so thatched huts. This was real jungle, Ocelots lived behind the 'specialists house' and stole chickens every night. A jaguar swiped the pigs. And a tapir was holding a nightly levee in the sugar cane patch.

"Collecting was wonderful. The river bank was loaded with Pieridae and *Actinote*, the flowering shrubs along the trail were dancing with Theclas, Ithomidae and Papilios. The deep jungle was the haunt of Erycinids and those curious scaleless Satyrids. These are starling on the trail -- they look like a pair of brilliant eye-spots wandering around looking for a butterfly. The Erycinidae play tricks

with you, now you see them and now you don't. It isn't bad enough that they mimic every conceivable small butterfly or moth, but they light out of sight on the underside of huge leaves. It's in this dark jungle that we caught giant dragon-flies with abdomens over six inches long and a good ten inch wing spread. Their funny flight led Mrs. Brown to call them autogyros.

"On another trip when we were down on the Rio Upano we had hard luck. Out of some eight weeks we got less than seven days of collecting weather. On this eastern slope the rainy season is a little wetter than dry season. It rains all of the time. Nevertheless we spent some exciting hours when the sun was out and a half dozen or more *Morphos* were flirting about just out of reach of our nets. We snagged a few but they were a bit worse for wear. They and the evening-flying *Caligos* were best taken at bait. With such a method we had a little better luck.

"Our most interesting times, at least to me, were spent in camp high above the trees on the giant mountains. There we really made a few contributions to science. First, we better than doubled the known paramo butterfly fauna, and secondly we collected about 500 new species of Diptera. One of these is worthy of mention. We were in camp on Tungurahua at about 13,000 feet. One misty morning the four of us, two Browns and two botanists: Dr. Penland and Mr. Summers, decided to climb as high as we could on the mountain. At 14,000 feet I popped into a vial of alcohol what I took to be a pair of harvesters, daddy-long-legs. Later, at 15,600 feet Mrs. Brown took another. This time a closer examination showed it to be a wingless *Tipulid* fly. Later we collected about 45 more. Dr. Alexander at Amherst says these are the first of their kind known.

"Camping at such heights in the tropics is no warmer than here in Colorado. We constantly wore wool shirts, sweaters and leather jackets. We were treated to a four hour blizzard on Chimborazo that was a honey!"

As indicated in the above account, some few months were spent in the vicinity of Baños, with trips down the Pastaza to Puyo, and further including a noteworthy trip to the southeastern slopes of Mount Tungurahua on the Minza Chica paramo. Most of the Ti-

tipulidae of this particular station (April 2 — 15, 1939) were from altitudes of about 3750 to 4000 meters, and included the strange subapterous crane-fly *Tipula (Eumicrotipula) phalangioides* Alexander, mentioned above. Brown records that during these twelve collecting days at such high altitudes very inclement weather prevailed, with almost continual rain and mist, making it virtually impossible to collect many insects, including Virtually all specimens of Tipulidae found here belong to the two genera **Tipula** and **Limonia**, and three species of the former were noted ovipositing in wet moss on the slopes of the quebradas.

Other localities visited by Professor Brown and party from which Tipulidae were taken include the following.

November 1938 — Pichincha — Uyumbicho (2700 meters); Rio San Pedro, Chillo Valley (2400 meters); Hacienda San Rafael, Rio San Pedro (2700 meters); paramo of Pasachoa at 3300 meters; paramo Tiupullo (Cotopaxi) at 3500 meters. Macas, Rio Upano, in January and February 1939. Cuenca in February. On the trip down the Rio Upano, a period of some eight weeks, there were fewer than seven days when collecting was possible. Most of April and May 1939 were spent at the higher levels, including the noteworthy trip to Tungurahua, discussed above, and a further period spent in the general vicinity of Chimborazo, including the following stations: Urbina, Cerro Chimborazo, the paramo at 3600 to 3650 meters; Riobamba (2700 meters); Cumbre de Tililac, at the summit of the pass (4200 meters); El Calere (3400 meters); and the Cerro Chimborazo, to 4000 meters, where in a period of four days only two hours of collecting weather was possible! Other collections were made at the Hacienda Talahua (Bolivar) from 2900 to 3100 meters, and in May at Cuicocha (Imbabura), near the volcano Cotacachi (3300 meters).

I am vastly indebted to Professor and Mrs. Brown for their great kindness in collecting the large and valuable series of Tipulidae under such difficult and adverse conditions. Particular attention is directed to Brown's "A Gazetteer of Entomological Stations in Ecuador," *Ann. Ent. Soc. America*, 34: 809—851, 10 maps; 1941. This must always be considered as being a major contribution to entomological literature and one of the most valuable single papers ever published.

David Laddey, just through high school in Newark, New Jersey, in 1938, became interested in insect collecting in Ecuador through Miss Dora Macintyre, sister of William Clark-Macintyre. He decided to go to Ecuador, leaving in August 1938, on a freighter. It is of interest to note that on the same boat was the party of Professor F. Martin Brown, whose work and achievements have just been noted. Upon arriving in Ecuador, Laddey Joined Macintyre and was associated with him in the Baños-Abitagua section between September 1938 and June 1940. After that date he collected alone and visited some unusually rich and interesting sections of the Republic. He spent the period between July 1940 and May 1941, a total of eleven months, at Santo Domingo de los Colorados (Pichincha) at Palmar (Manabi), and thence proceeding to Morro (El Oro). Here and in the Provinces of Loja and Santiago Zamora he spent about six months, or until January 1942. The final three months were chiefly near Macuchi (Cotopaxi). Laddey left Ecuador on June 28, 1942, after having spent three years and nine months in the country. His materials were handled and distributed chiefly through Macintyre and Brown. Laddey's collections of Tipulidae must be considered as being of unusual interest and importance. At present (1952) he lives at 505 Boaret St., Santurce, Puerto Rico. Dr. Roberto Levi-Castillo, a well-known student of the mosquitoes of Tropical America and Director of the Entomological Research Center at Guayaquil, has sent me various specimens of Tipulidae, captured in connection with his work on the Culicidae. Although comparatively few in number, some of the species provide interesting records, in some cases being new to Ecuador. Levi-Castillo's materials were taken chiefly in the vicinity of Guayaquil, but the most important materials are from Cuenca (Azuay), where the specimens were taken entirely at acetylene lights and the flies picked from the nearby lighted walls of a house. Further materials were taken at Tena (Napo-Pastaza), in the humid tropical jungle of the upper Amazon, and again at Santo Domingo de los Colorados (Pichincha), a station where Laddey had earlier made further large and important collections. Dr. Levi-Castillo will continue to collect Tipulidae in various parts of Ecuador, in conjunction with his studies on the mosquitoes.