

Studies of Neotropical Caddisflies,
XLV: The Taxonomy, Phenology,
and Faunistics of the Trichoptera
of Antioquia, Colombia

OLIVER S. FLINT, JR.

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Studies of Neotropical Caddisflies,
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ABSTRACT

Oliver S. Flint, Jr. Studies of Neotropical Caddisflies, XLV: The Taxonomy, Phenology, and Faunistics of the Trichoptera of Antioquia, Colombia. *Smithsonian Contributions to Zoology*, number 520, 113 pages, 412 figures, 6 graphs, 1 map, 11 tables, 1991.—The Department of Antioquia, with its capital Medellín, is situated in the northwestern quadrant of Colombia, South America. In elevation it runs from sea level to 3,900 meters and, in general, has abundant rainfall. Most of the material comes from the montane areas near Medellín, including year long emergence trap collections made at 3 sites by U. Matthias. These emergence trap collections show a definite correlation between emergence and rainfall pattern. The fauna, although nearly 46% is still known only from this one region, seems to show a distribution pattern that extends along the Andes to Ecuador and/or Venezuela, at a minimum. The 37 genera recorded belong to 13 families, and contain 124 named species, plus another 23 species whose material was not adequate for description. Of the 124 named species, 69 are described as new in this work. All the species are keyed, discussed, and illustrated.

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Oliver S. Flint, Jr.

Introduction

The Department of Antioquia is situated in the northwestern quadrant of Colombia (Map 1). It is an area of great topographic diversity, running from the Caribbean Sea along its northern border to several high elevation paramos at about 3900 m in the western-central region. The Río Cauca roughly divides the department in eastern and western halves. The western range of the Andes rises abruptly to the west of the Río Cauca, and, although rather narrow, contains the highest elevations in the department. The central range of the Andes, between the Río Cauca and Río Magdalena, is lower, barely surpassing 3000 m and is the site of Medellín, the departmental capital at 1450 m. Much of the western margin of the department, beyond the western range of the Andes, is in the lowlands of the Chocó at under 100 m as is the eastern border along the Río Magdalena.

Most of the department appears to be well watered with annual rainfall amounts in the 2000 to 4000 mm (80–160 inches) range. The Río Cauca valley, a rather narrow band between the western and central Andean ranges, appears to be in a rain shadow with 600 to 2000 mm (25–80 inches) of rainfall annually (Roldán, 1988). The effects of this are evident to even the casual visitor in the very different, more desertic, type of vegetation seen around Santa Fé de Antioquia in the Cauca Valley. The area near Medellín, in the central range, is definitely more lush with evergreen forest in the small areas where it has not been cleared.

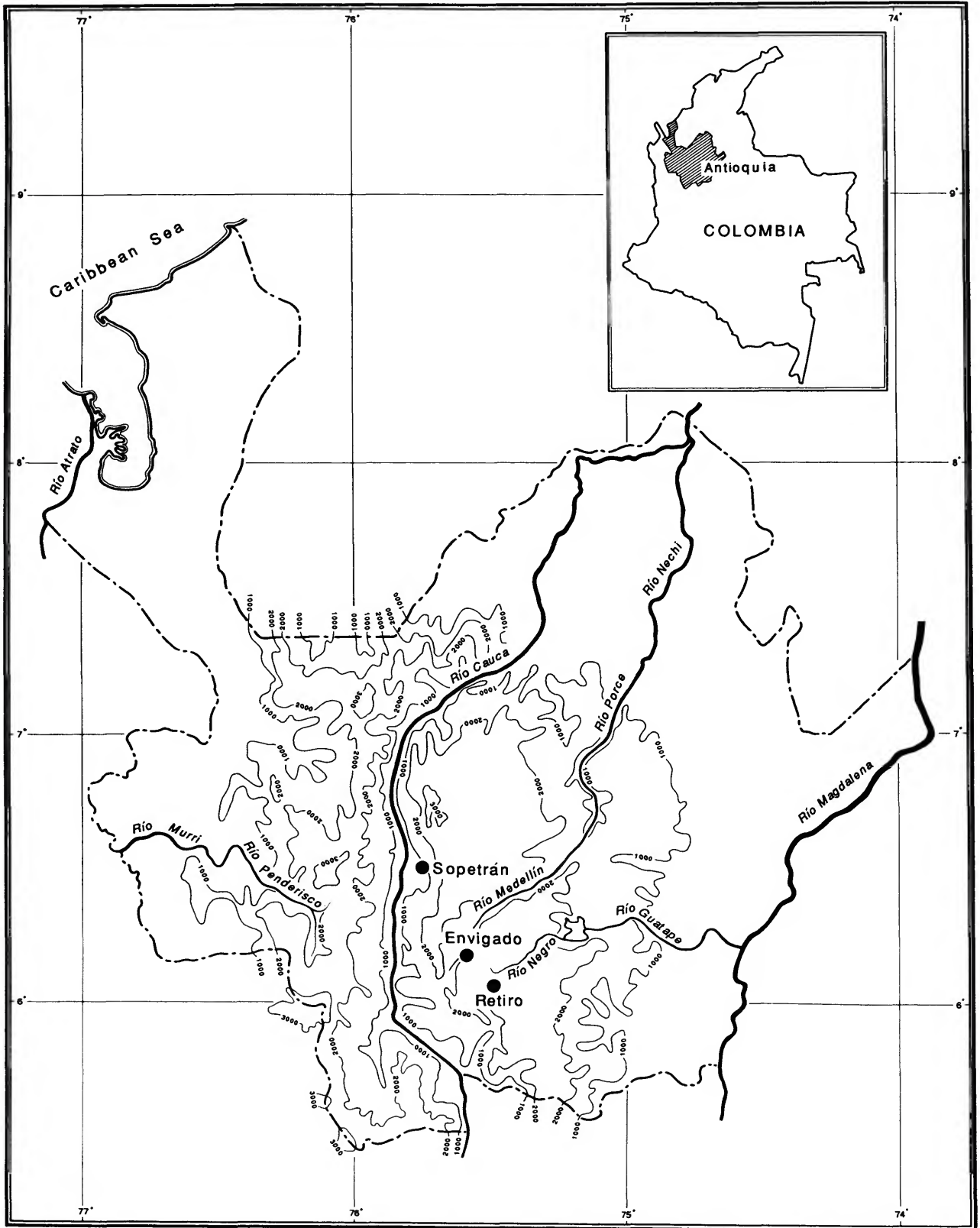
This report on the caddisflies of Antioquia is based primarily on three collections. I made two collecting trips of about 3 weeks each in 1983 and 1984 during February and February–March respectively. Most of these collections were concentrated within a radius of 50 km of Medellín. Excursions outside

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of the department were made in both years, to the Departments of Meta and Chocó in 1983 and Caldas and Risaralda in 1984, but these collections are not described here unless the same species were taken in Antioquia. The third, and a very important collection, was made by Uwe Matthias between April 1983 and March 1984. This consists of a years emergence trap collection from three sites near Medellín, differing in elevation and rainfall. A section of this paper, starting on page 3, is devoted to a discussion of these collections. Small numbers of specimens were found in a few other museum collections as reported on page 3.

ACKNOWLEDGMENTS.—I am deeply indebted to Gabriel Roldán Pérez, Professor of Biology at the University of Antioquia, Medellín, Colombia, who wholeheartedly supported all phases of this study. He not only made arrangements for my field work in Colombia in 1983 and 1984, but has provided information and encouragement for the project whenever called upon. Margarita M. Correa G., then at the University of Antioquia, was a great help with her knowledge of the local Trichopterous fauna. She, her husband and family were very supportive during our stays, especially in 1983 when they were my gracious hosts. The other co-workers and students of Dr. Roldán were most free with their advice and time: Luis F. Velásquez V., Tito Machado C., Nicolás Paz, José Rincón, María Cecilia Arango J., Luisa Fernanda Alvarez A., Marta Wolf, and Inés Bedoya O. I am also indebted to the authorities of the University of Antioquia for supplying a vehicle and driver for extended field travel to Chocó, Caldas, and Risaralda. The support from everyone at the University of Antioquia was overwhelming and is most gratefully acknowledged.

Raul Vélez-Angel and Adolfo Molina of the Medellín Section of the National University of Colombia gave me free access to the collections under their care, and provided



MAP 1.—Department of Antioquia, Colombia, showing main topographic features, position in Colombia (upper right), and locations of the three emergence trap sites.

information on associated data: I am most grateful for their help. Uwe Matthias was our guide and constant companion during field work in 1984, for which he is thanked most deeply. I thank my wife who accompanied me in 1984 for help with collecting and recording the field data. Fluid Research Funds, which made my trips to Colombia possible in 1983 and 1984, were generously granted by the then Secretary of the Smithsonian Institution, S. Dillon Ripley.

ABBREVIATIONS.—The collections upon which this study are based are few in number, there apparently have been few collections made in this region in times past. The primary material, now at the National Museum of Natural History (USNM), Smithsonian Institution, Washington, D.C., consists of those collections I made in 1983 and 1984, some old material found in the collections here, and the primary portion of the emergence trap collections. Material listed with no repository indicated is located in the National Museum of Natural History. Material was found in the entomological collection at the Universidad Nacional de Colombia, Seccional Medellín (UNCM), Medellín, Colombia. I am also placing a synoptic series of the caddisflies taken in the region in this collection. Material is also found in the collection of the Departamento de Biología, Universidad de Antioquia (UA), Medellín, Colombia. This consists of specimens collected by Margarita Correa and other students, as well as excess, duplicate material from the emergence trap collections not seen by the author. A few specimens were found in the collection of the Illinois Natural History Survey (INHS), Champaign, Illinois (through J.D. Unzicker), the Museum of Comparative Zoology (MCZ), Harvard University, Cambridge, Massachusetts, and the San Diego Natural History Museum (SDNHM), San Diego, California (through David Faulkner). Duplicate examples of species from Venezuela will be placed in the collection of the Instituto de Zoología Argícola, Universidad Central de Venezuela, Maracay, and examples from Costa Rica in the collections of the Department of Entomology, University of Minnesota, St. Paul, Minnesota, and the Instituto Nacional de Biodiversidad, Heredia, Costa Rica.

Emergence Trap Collections

Uwe Matthias, then at the University of Kassel, F.R. Germany, spent a year between April 1983 and March 1984 at the University of Antioquia. During this period he studied the emergence of aquatic insects at three sites using the emergence trap technique (Illies 1971, 1972). The results of this effort are reported in Wolf, Matthias, and Roldán (1989). Matthias and Roldán have also sent me full sets of their data, and given me permission to use it as I see fit.

The data supplied by Matthias on the Trichopteran emergence by month at each site (Tables 6, 7, and 8) are reproduced here as received, except for a re-ordering of the species to

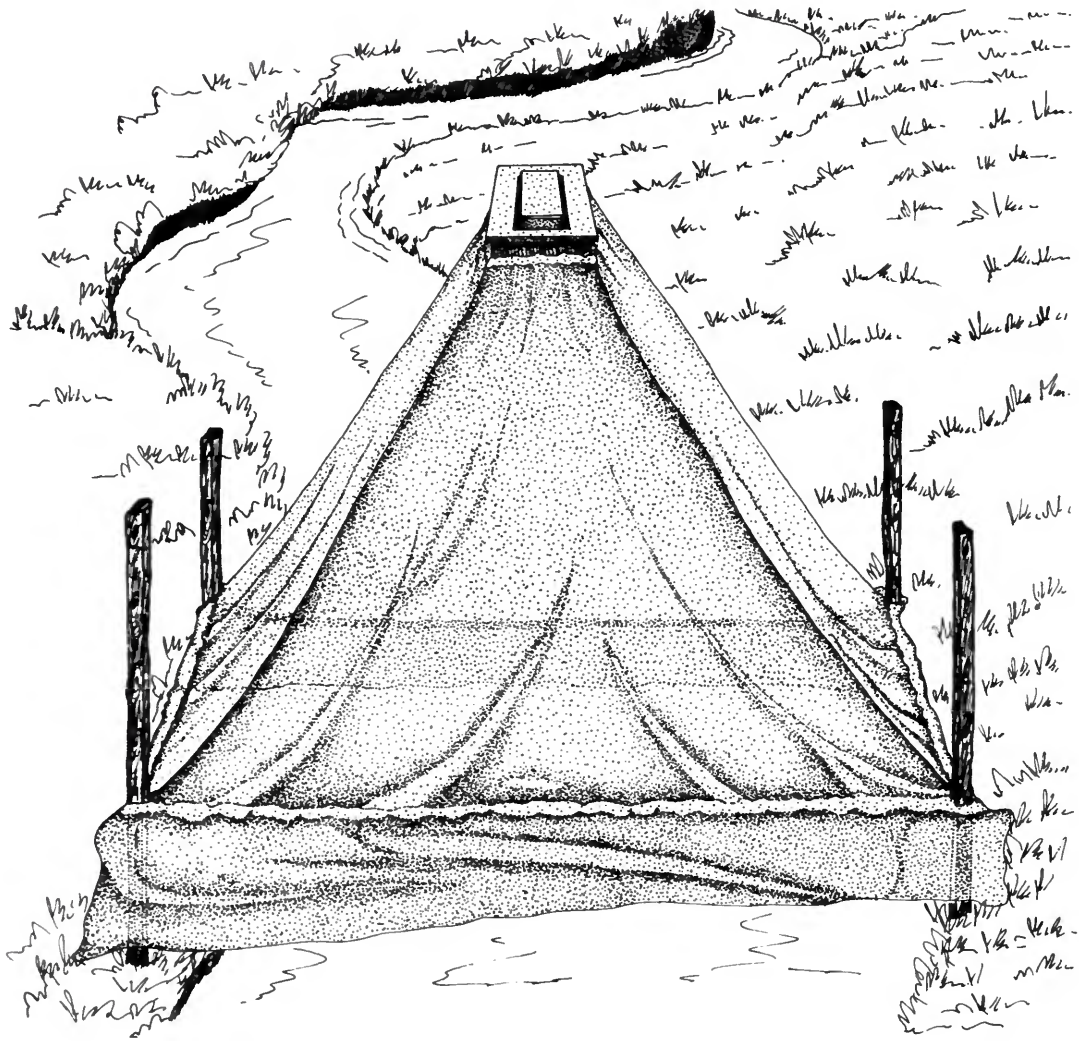
correspond to the order they are treated in the text. The aquatic insect emergence by site and month (Tables 3, 4, and 5) are taken (the non-Trichopteran figures are summed) from tables 5, 6, and 7 in Wolf, Matthias, and Roldán (1989). Tables 1 and 10 have been then been produced by summing the figures in Tables 3, 4, and 5. Unfortunately the two sets of Tables can not be directly derived from each other although there is an overall correspondence, nor can they be corrected as the materials have now been divided and dispersed, with pooling of collections from different dates.

Three sites were selected for the study, situated in three different zones (cold, temperate, and warm) located in the Municipalities of El Retiro, Envigado, and Sopetrán, respectively (Map 1).

ZONE A: MUNICIPALITY OF EL RETIRO.—The site is 30 km to the east of Medellín and is in the Holdridge zone bmh-MB, the lower montane wet forest. The general climatic limits of this zone are a mean biotemperature between 12 and 18° C, and an annual rainfall between 2,000 and 4,000 mm. The stream at the study site is called "La Cebolla," and traverses, at 2,150 m elevation, the development of "Fizebad," which is 6 km west of the town center of El Retiro. A 13 year (1972–1984) average of rainfall at "Fizebad" is 2090 mm, distributed through the year as shown in Graph 2. The stream at the study site has the following characteristics: 1.2 m wide, 0.1 m deep, stream velocity 0.8 m/s, and average flow volume of 100 l/s. The area of water covered by the trap was 2.4 m². The substrate consists mainly of small stones and sand, and in some areas the bottom takes on an orange color.

ZONE B: MUNICIPALITY OF ENVIGADO.—The site is south of the city of Medellín and in the Holdridge zone of bh-P, the premontane moist forest. The general climatic limits of this zone are a mean biotemperature between 18 and 24° C, and an annual rainfall between 1,000 and 2,000 mm. The collecting site was set up in the stream called "La Ayurá" close to the water treatment plant of that name, approximately 2 km from the center of Envigado and at 1750 m elevation. A 12 year (1973–1984) average of rainfall at Envigado is 1840 mm, with a seasonal distribution as shown in Graph 2. The characteristics of the stream are: 1.1 m wide, 0.1 m deep, velocity 0.9 m/s, average volume of flow 300 l/s. The trap covered 2.6 m² of the stream. The substrate is composed mainly of rocks which produce a tumbling watercourse.

ZONE C: MUNICIPALITY OF SOPETRÁN.—The site is west of Medellín in the Holdridge zone bs-T, the tropical dry forest. The climatic limits of this zone are a mean biotemperature above 24° C, and an annual rainfall between 1,000 and 2,000 mm. The collecting site is on the stream "La Jiménez" at 780 m elevation, in the development "El Rodeo" at about 4 km from the center of Sopetrán. The 9 year (1976–1984) average rainfall at Sopetrán is 972 mm, distributed over the months as shown in Graph 2. The stream's characteristics are: 0.5 m wide, 0.05 m deep, velocity 0.8 m/s, average volume of flow 20 l/s. The trap only covered 1 m² of the stream whose substrate is mostly sand and pebbles.



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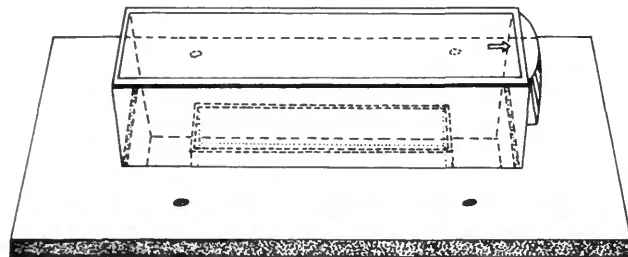


FIGURE 1.—Emergence trap in place on a stream, above, and detail of the collecting container from the top of the trap, below (Figure courtesy of Wolf, Matthias, and Roldán, 1989).

METHODS.—The three emergence traps were emplaced by April 1983 and remained in place through March 1984. Each emergence trap is constructed of white gauze and covers approximately 4 square meters (Figure 1). At the top of the trap is a plastic container into which the emerging insects fall. The preservative is alcohol and glycerine in the ratio of 9 : 1 (Wolf, Matthias and Roldán, 1989). The emerging insects fly to the top of the trap where they soon fall into the preservative. The preserved insects were removed periodically, taken to the Limnology Laboratory of the University of Antioquia where they were sorted and identified as far as possible.

Simultaneously with the trapping of the insects, samples of the water were taken for chemical analysis. The temperature of the water and air, the pH, and the conductivity were noted at the site immediately after the removal of the emerged insects. In

the Limnology Laboratory the following parameters were determined: dissolved oxygen by the Winkler method, biochemical oxygen demand by incubation and determination using the Winkler method, the levels of ammonia, nitrites, nitrates, and phosphates colorimetrically with a photocolormeter (Model DR-EL-LP-G), and chlorides, hardness, and alkalinity by titration (APHA, 1980).

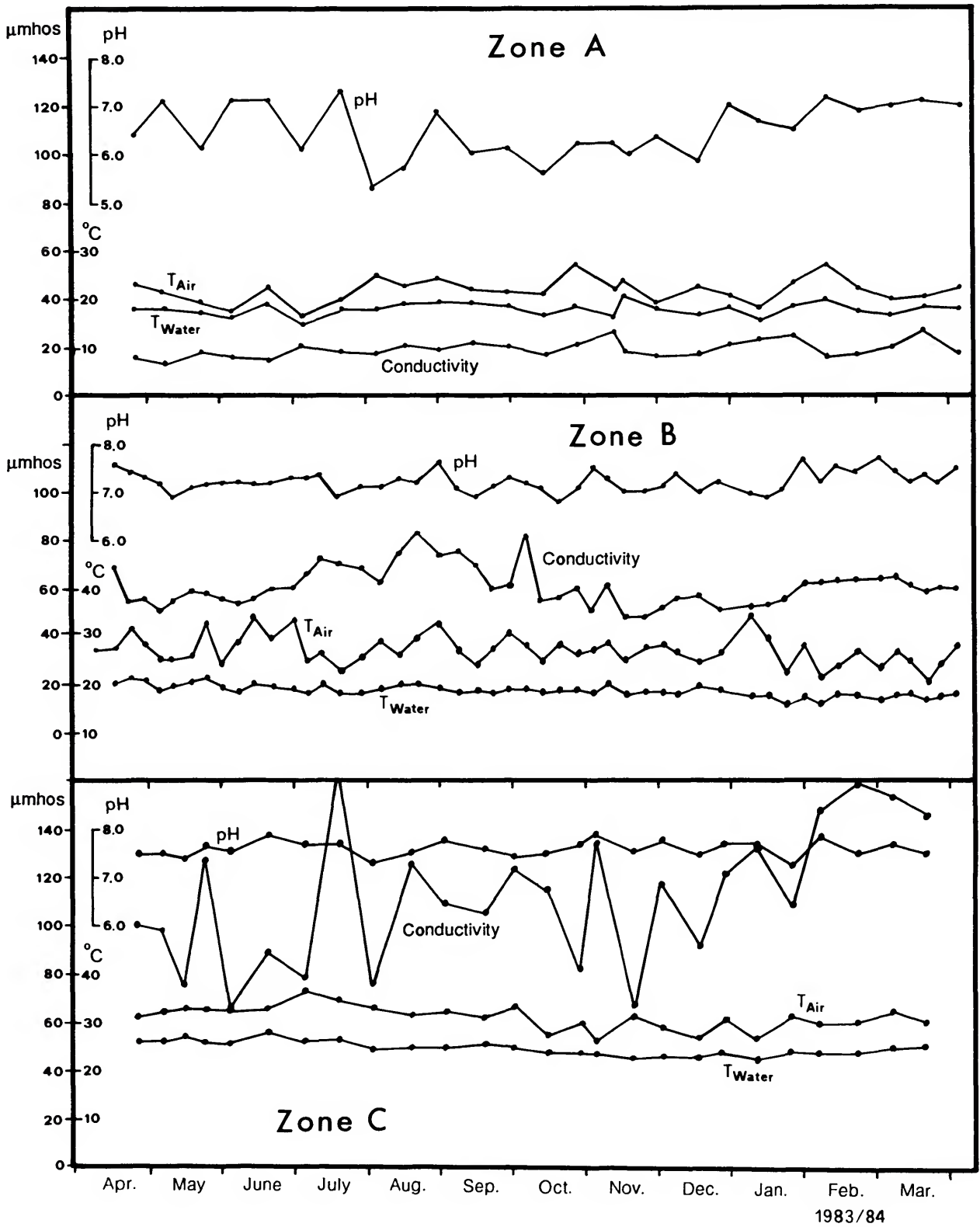
RESULTS, ADULTS.—The emergence traps collected 39,552 aquatic insects belonging to 7 orders and 52 families. The order Diptera had the greatest number of families (24), as well as individuals (35,043). The trichoptera were the second most numerous with 11 families and 3,685 individuals. The other orders were, in decreasing abundance: Hymenoptera (8 families, 536 individuals), Ephemeroptera (3 families, 170 individuals), Odonata (5 families, 60 individuals), Lepidoptera

TABLE 1.—Number of aquatic insects, by sex and group, collected in each of the emergence traps.

	Zone A	Zone B	Zone C
	♂♂/♀♀ = total	♂♂/♀♀ = total	♂♂/♀♀ = total
DIPTERA	3,485/6,126 = 9,611	3,537/8,329 = 11,866	4,323/9,243 = 13,566
EPHEMEROPTERA	2/0 = 2	10/3 = 13	71/84 = 155
HYMENOPTERA	23/39 = 62	147/208 = 355	45/74 = 119
LEPIDOPTERA	1/0 = 1	25/14 = 39	0/6 = 6
ODONATA	0/1 = 1	23/28 = 51	3/5 = 8
PLECOPTERA	9/3 = 12		
TRICHOPTERA	618/1,022 = 1,640	776/875 = 1,651	167/227 = 394
Calamoceratidae	1/1 = 2	7/12 = 19	1/0 = 1
Glossosomatidae	0/2 = 2	9/19 = 28	2/5 = 7
Helicopsychidae	4/18 = 22	481/438 = 919	10/12 = 22
Hydrobiosidae	2/4 = 6	5/6 = 11	
Hydropsychidae	504/714 = 1,218	95/102 = 197	18/35 = 53
Hydroptilidae	75/228 = 303	121/205 = 326	131/173 = 304
Leptoceridae	27/41 = 63	10/11 = 21	
Odontoceridae	6/10 = 16		
Philopotamidae	4/3 = 7	43/79 = 122	5/1 = 6
Psychomyiidae		4/2 = 6	
Xiphocentronidae	0/1 = 1	1/1 = 2	0/1 = 1
TOTAL	4,138/7,191 = 11,329	4,518/9,457 = 13,975	4,609/9,639 = 14,248
GRAND TOTAL = 39,552			

TABLE 2.—Physicochemical readings at each of the three emergence trap sites, giving the high, low, and 12-month average readings.

	Zone A			Zone B			Zone C		
	low	high	aver.	low	high	aver.	low	high	aver.
Air temperature (°C)	18.25	24.75	21.62	24.08	30.22	27.32	28.65	35.7	31.29
Water temperature (°C)	16.95	18.96	17.76	17.62	20.17	18.97	23.35	26.9	24.97
pH	5.5	7.1	6.47	7.05	7.47	7.22	7.4	7.7	7.59
Conductivity (µmhos/cm)	16.2	23.6	19.18	52.45	74.4	61.19	77.65	155.0	133.3
Hardness (mg/l)	4.5	7.5	5.8	17.0	25.5	20.65	25.0	60.0	45.0
Alkalinity (mg/l)	2.5	5.0	3.5	16.5	39.0	22.00	20.5	55.0	40.5
D.O. (mg/l)	7.4	9.6	8.08	7.6	9.0	8.14	7.5	9.0	8.05
B.O.D. ₅ (mg/l)	0.3	2.3	1.01	0.2	1.4	0.78	1.2	3.4	2.12
NH ₄ ⁺ (mg/l)	0.02	0.43	0.161	0.01	0.27	0.15	0.05	0.38	0.18
NO ₂ ⁻ (mg/l)	0.001	0.009	0.0046	0.001	0.024	0.0076	0.007	0.082	0.039
NO ₃ ⁻ (mg/l)	0.1	1.4	0.76	0.2	2.2	1.18	0.3	5.6	1.49
PO ₄ ³⁻ (mg/l)	0.01	0.11	0.033	0.01	0.09	0.028	0.01	0.46	0.133
Cl ⁻ (mg/l)	2.0	4.5	3.21	1.5	5.0	3.46	4.0	11.0	6.7



GRAPH 1.—Yearly fluctuation of pH, conductivity, air, and water temperatures in each of the 3 emergence trap streams.

(1 family, 46 individuals), and Plecoptera (1 family, 12 individuals). Table 1 enumerates, by sex, the total number of organisms collected at each site.

RESULTS, PHYSICO-CHEMICAL.—Table 2 and Graph 1 show the fluctuations and summaries of the readings for each station. The values of the physicochemical parameters show, in general, a tendency to increase from Zone A to Zone C. The values of dissolved oxygen are high in all zones, while those of biochemical oxygen demand are low, reflecting the generally good water quality. The conductivity, hardness, and alkalinity are all indicative of soft waters, although at Zone C they approach hardness. However, the nitrogen and phosphorus levels are a bit high, indicative of some enrichment, especially at Zone C.

DISCUSSION.—I am particularly interested in any correlation between emergence and rainfall patterns in aquatic insects in tropical environments. In recent years there has developed a growing consensus among field collectors of aquatic insects in the Neotropics that early in the rainy season is the best time to make collections. However, this has been based primarily on anecdotal information. In an effort to make a more objective comparison, I have made an effort to compare graphically rainfall and emergence on the basis of this emergence trap data.

Tables 3–5 present the results, by month, of the Trichoptera by family, and the other insects by order, for each of the three sites. Tables 6–8 with the specific emergence data for the Trichoptera are based on the initial sorting to species by Matthias, and although there would be some minor changes if they could be resorted on the basis of the systematics here presented, much of the material is not presently available, and I doubt if significant changes in the numbers would occur.

Fortunately, monthly rainfall totals are available for the three zones, for 13 years at Zone A, 12 years 10 months at Zone B, and 9 years 8 months at Zone C. These are summarized in Table 9 and shown in Graph 2. All stations show a peak of rainfall in mid-April and a secondary peak, almost of the same height in early October. Rainfall declines by July, rather sharply at Zones A and B, but rather shallowly at Zone C, before rebounding to its second peak in October. From October, rainfall declines sharply to January, and begins to rise slightly in February, and more steeply in March toward the April–May maximum. In the Neotropics, this type of bimodal rainfall pattern is only shown clearly in the Andes of Colombia (Anderson et al., 1958).

A comparison of the average rainfall, the actual rainfall for 1983–1984, Trichoptera emergence, and total insect emergence for each Zone is derived from the data in Tables 10 and 11 and is plotted in Graphs 3–5. In Zone A, Trichopteran emergence first peaked in May–June, then dropped sharply in July just to rise to a higher peak in August, then declined to their lowest and rather constant levels from November to March. In contrast the total insect emergence peaked sharply in May, declined regularly to a minimum from November to

January when emergence began to climb again. At Zone B much the same picture emerges with a peak of Trichopteran emergence in April with a sharp decline to June, rebounding in July then declining to an irregular low from September to March. Here the total insect emergence was highest in April, declining to an irregular low from September through March. At Zone C the picture is clearest for both Trichoptera and all insects; a peak in May, declining to a low level in September or October from which emergence remained low through March. In an attempt to average out individual anomalies, I averaged the data for all stations—average rainfall, actual rainfall for 1983–1984, Trichoptera emergence and all insect emergence (Tables 10, 11)—and present the results in Graph 6. In this one can see that actual rainfall peaked in April, near the normal peak, declined to June when it started to climb irregularly to December, then dropped to low points from January through March, not exactly the long term average, but roughly following the pattern. Trichopteran emergence peaked in April, declined irregularly to December, and remained low thereafter. The total emergence of aquatic insects followed a similar pattern, peaking in May, declining regularly till September and remaining low thereafter.

CONCLUSIONS.—First I must state that all comments are based on “eye fit” correlations between lines on the graphs, not on more rigorous statistical correlations. Also, any conclusion based on only one year’s data is very tenuous, but I hope that averaging many taxa in large quantities partially overcomes this problem. Also, I realize that this is an average result, and that certain insect species will have different life histories from the average. But I feel the results are reasonably consistent for both Trichoptera and all insects, and probably represent the general correlation quite well.

Trichopteran and especially all aquatic insect emergence is clearly correlated with rainfall. Here, where the lowest rainfall is in January with a peak in mid-April and a second peak in October, emergence also peaks in April–May, then declines steadily to a low point in October–December and remains low until the rains start the following March–April. The correlation in general is with the average rainfall, but undoubtedly some specific rainfall events in February–March actually trigger the emergence program which culminates a month or two later in the emergence peak. There seems to be no indication of a second emergence peak in relation to the October rainfall peak.

Distributional Patterns

The known distributions of the 124 named Antioquian species were divided into a series of 7 patterns, roughly in order of increasing range. It is assumed that a species will be found in suitable niches between the farthest known parts of the range of a species. The categories and their ranges are listed below with the number of species and percent of total that are found in each category.

TABLE 3.—Aquatic insect emergence at Zone A (Retiro) by month and sex (σ° σ° / $\varphi\varphi$).

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DIPTERA	467/719	572/1,050	602/898	523/760	243/551	190/392	110/314	48/274	154/205	87/190	171/309	318/464
EPHEMEROPTERA		1/0	1/0									
HYMENOPTERA	1/1	6/11	6/4	1/0	2/3	1/6				6/14		
LEPIDOPTERA										1/0		
ODONATA							0/1					
PLECOPTERA			1/0	2/0	5/3		1/0					
TRICHOPTERA												
Calamoceratidae		1/0										0/1
Glossosomatidae		0/2										
Helicopsychidae		0/3	0/2	0/1	2/5	0/5	0/2		1/0			1/0
Hydrobiosidae			0/1	0/1	1/0	1/0	0/2					
Hydropsychidae	10/18	56/88	78/113	43/74	107/132	85/143	58/73	15/23	6/15	12/7	21/11	13/17
Hydroptilidae	5/6	28/52	7/59	4/21	11/40	11/16	7/21		0/4	0/3	0/4	2/2
Leptoceridae	3/1	6/9	3/2	3/2	0/3	1/4	3/5	0/1	0/4	1/3	0/4	2/3
Odontoceridae		3/2	0/3	2/2	0/1	1/0		0/1		0/1		
Philopotamidae					1/0	1/0	0/1	0/1	1/0	0/1	1/0	
Xiphocentronidae	0/1											

TABLE 4.—Aquatic insect emergence at Zone B (Envigado) by month and sex (σ° σ° / $\varphi\varphi$).

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DIPTERA	654/1,249	543/945	323/687	291/846	226/684	170/390	136/343	227/560	162/403	318/850	258/728	229/644
EPHEMEROPTERA	4/1	1/0		2/1							3/1	
HYMENOPTERA	119/68	4/44	6/20	6/26	7/19	2/13	1/4	0/1		0/3	0/3	2/7
LEPIDOPTERA	2/0						1/2	1/2	4/2	5/3	8/4	4/1
ODONATA	7/7	4/2	3/6	6/3	0/5	1/1	0/2	1/1			1/1	
PLECOPTERA												
TRICHOPTERA												
Calamoceratidae	1/1	1/1		0/1	2/1		0/1	0/2	0/2		3/0	0/3
Glossosomatidae	2/4	2/2		1/3	1/1			0/1		1/4		2/4
Helicopsychidae	151/161	52/54	21/17	87/50	47/39	26/14	6/18	43/36	4/5	7/12	12/11	25/21
Hydrobiosidae	0/3	1/1	1/0					2/1		1/1		
Hydropsychidae	38/19	6/11	7/13	21/21	7/6	0/1	0/6	3/5	3/6	6/6	2/3	2/5
Hydroptilidae	37/63	22/38	14/4	27/30	4/6	2/2	0/3	3/10	1/0	6/19	1/16	4/14
Leptoceridae	0/3	1/0	1/0	4/4	3/2			0/1	1/1			
Odontoceridae												
Philopotamidae	21/26	3/7	4/4	8/14	3/12	0/2	1/1	1/6		0/1	1/4	1/2
Psychomyiidae	3/0			1/2								
Xiphocentronidae	0/1									1/0		

TABLE 5.—Aquatic insect emergence at Zone C (Sopetrán) by month and sex (σ° σ° / $\varphi\varphi$).

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
DIPTERA	774/1,670	1,019/2,079	693/1,754	646/1,054	538/1,007	112/318	93/229	140/277	68/186	109/356	59/141	72/172
EPHEMEROPTERA	12/18	43/36	3/5	2/3	2/8	4/5	3/4		1/0	0/2	1/2	0/1
HYMENOPTERA	1/2	2/3	16/11	6/23	6/10	2/7	2/6	2/2	0/1	5/6	2/2	1/1
LEPIDOPTERA		0/2	0/1		0/1		0/1	0/1				
ODONATA		1/0	0/2	0/1			0/1		1/0	1/1		
PLECOPTERA												
TRICHOPTERA												
Calamoceratidae		1/0										
Glossosomatidae	0/1	2/4										
Helicopsychidae	1/2	2/2	5/2	1/0		0/1	1/2	0/2		0/1		
Hydrobiosidae												
Hydropsychidae	0/3	3/11	3/5	2/4	0/1	2/4	5/1		0/3	2/2	1/0	0/1
Hydroptilidae	26/41	39/59	28/22	17/26	13/15	3/8	4/1	0/1				1/0
Leptoceridae												
Odontoceridae												
Philopotamidae		1/0	3/0	1/0	0/1							
Xiphocentronidae						0/1						

TABLE 6.—Trichopteran emergence at Zone A (Retiro) by species, month, and sex (♂♂/♀♀).

Taxon	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
<i>Atopsyche callosa</i>		0/1	0/1	1/0	1/0	0/1						
<i>Atopsyche</i> sp. A					0/1							
<i>Mortoniella enchrysa</i>		0/2		1/0	1/0	0/1	1/1	1/1	0/1	1/0		
<i>Wormaldia proluxa</i>												
<i>Xiphocentron (A.) muestelens</i>	0/1				2/0							
<i>Hydropilla constricta</i>	1/0									1/0		1/0
<i>Hydropilla inornata</i>	0/2	0/2	0/1			0/1						
<i>Hydropilla unicuspis</i>				1/1								
<i>Oxyethira absona</i>	11/15	10/15	2/2	3/10	4/4	2/6	0/1	0/3	0/3	0/2		
<i>Neotrichia tauricornis</i>			1/0		0/1							
<i>Ochrotrichia (M.) malada</i>	2/0	2/0	0/3	1/1								
<i>Ochrotrichia (M.) prostridens</i>					1/0							
<i>Ochrotrichia (M.) bola</i>	7/24	3/52	3/14	6/31	4/12	5/12	0/1	0/1	0/1	0/1	2/2	4/5
<i>Ochrotrichia (M.)</i> sp. D							0/1					
<i>Ochrotrichia (M.)</i> sp. J												
<i>Ochrotrichia (O.)</i> sp. A		0/1										
<i>Smicridea (S.) protigera</i>	55/88	72/106	44/75	110/138	86/144	57/71	14/23	6/14	14/8	14/9	17/13	14/22
<i>Smicridea (R.) ventridenticulata</i>			1/0	1/0	0/1		1/0	0/1				
<i>Centromacronema apicale</i> , var.		1/0										
<i>Triplectides flintorum</i>			1/0								0/1	
<i>Amphoropsyche quebrada</i>		1/0	0/1			0/1					1/0	
<i>Notalina (N.) mathiasii</i>												
<i>Nectopsyche</i> sp.		0/1	1/0	0/1			0/1					
<i>Triazenodes abruptus</i>	8/6	1/2	2/1	1/2	1/4	2/2	0/1	0/4	1/3	0/2	0/1	1/2
<i>Oecetis knutsoni</i>	0/2									0/1		
<i>Oecetis</i> sp.						0/1						
<i>Phylloicus</i> sp. 1	1/0										0/1	
<i>Marilia flexuosa</i>	0/1	0/1	0/1		1/0							
<i>Marilia gigas</i>	3/1	0/2	2/1	0/1			0/1	1/0	0/1			
<i>Helicopsyche breviterga and fistulata</i>	0/3	0/2	0/2	2/5	0/5	0/2		1/0			1/0	

TABLE 8.—Trichopteran emergence at Zone C (Sopetrán) by species, month, and sex (♂♂/♀♀).

Taxon	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
<i>Protophila voluta</i>	2/3	0/1									
<i>Chimarra (C.) duckworthi</i>	1/0		1/0								
<i>Chimarra (C.) emima</i>		0/1									
<i>Chimarra (C.) platyrhina</i>		1/0		1/0			0/1				
<i>Chimarra</i> sp. C				0/1							
<i>Wormaldia planae</i>		1/0	1/0								
<i>Neodocentron (C.) innaculatum</i>	7/10	2/6	5/5	0/1	0/1					1/0	
<i>Leucotrichia fairchildi</i>		0/1		1/3							
<i>Leucotrichia</i> sp.											
<i>Alisotrichia latipalpis</i>		1/2	0/1	1/0	1/0						
<i>Alisotrichia ventricosa</i>	30/46	18/11	9/9	10/12	3/5	4/1					
<i>Alisotrichia</i> sp.		0/1									
<i>Hydrophila narifer</i>	0/1	2/2	3/6		0/2						
<i>Neotrichia colombiensis</i> and <i>lawricornis</i>	1/0	1/0	1/0	1/1	0/1						1/0
<i>Ochrotrichia (M.) protirudens</i>								0/1			
<i>Ochrotrichia (M.)</i> sp. K				0/1							
<i>Rhyacopsyche jimena</i>		1/0	1/0	1/0							
<i>Smicridea (S.) bivittata</i>	0/1	1/0	0/2	0/1	1/4	4/1	1/0	0/2	0/1		0/2
<i>Smicridea (S.) nigripennis</i>	1/6	2/4	0/2	0/1	1/0	1/0		0/1	2/1	1/0	
<i>Smicridea (R.) biserrulata</i>								0/1			
<i>Leptonema albiovirens</i>	2/3	0/1	2/0					0/1			
<i>Phylloicus elegans</i>	1/0							0/1			
<i>Helicopsyche vergelana</i>	2/2	5/2	1/0		0/1	1/2	0/2		0/1		

TABLE 9.—Rainfall, in mm, at each emergence trap zone with the monthly and annual averages to the left, and lowest and highest readings in parentheses.

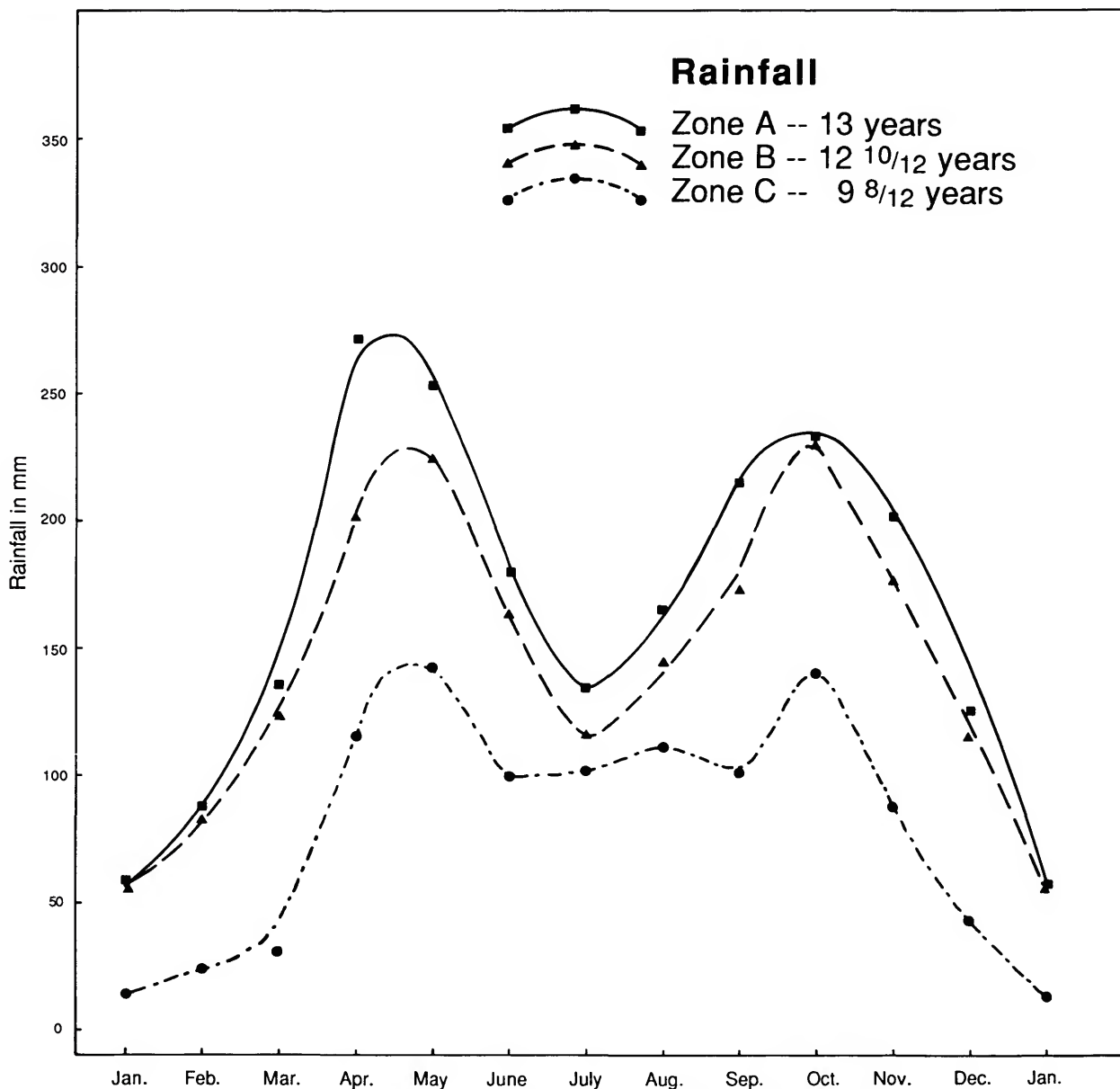
	Zone A 13 years	Zone B 12 ¹⁰ / ₁₂ years	Zone C 9 ⁸ / ₁₂ years
Jan	57.4 (8.3–167.5)	59.0 (12.2–151.1)	14.4 (0.0–49.5)
Feb	88.0 (10.0–213.2)	71.2 (14.0–159.4)	24.0 (4.4–53.7)
Mar	136.8 (48.8–288.8)	124.4 (23.8–213.4)	30.4 (5.8–77.2)
Apr	271.7 (169.0–434.4)	201.6 (99.9–321.6)	117.9 (68.8–199.7)
May	250.2 (154.4–412.3)	224.7 (107.0–406.0)	142.4 (90.5–390.7)
Jun	181.8 (58.0–282.7)	163.9 (89.1–253.3)	99.9 (60.8–147.4)
Jul	135.6 (13.3–249.4)	117.1 (3.4–240.7)	101.7 (25.4–210.0)
Aug	166.2 (61.5–305.3)	144.3 (55.3–241.7)	110.2 (31.5–333.8)
Sep	214.5 (95.2–353.2)	171.2 (82.3–358.8)	100.7 (45.4–155.5)
Oct	230.2 (134.0–290.6)	232.4 (155.0–351.1)	140.3 (10.2–209.4)
Nov	201.5 (99.7–293.3)	176.6 (108.0–241.9)	86.8 (28.3–157.0)
Dec	124.4 (22.0–241.6)	118.7 (30.7–264.4)	43.3 (4.5–94.9)
Annual	2,090 (1,681–2,474)	1,844 (1,261–2,286)	972 (676–1,383)

TABLE 10.—Insect emergence data for 1983–1984 by zone and month, Trichoptera, above and all insects, below.

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Trichoptera												
Zone A	44	250	268	153	303	268	172	41	31	28	41	41
Zone B	534	202	86	274	134	47	36	114	23	65	53	83
Zone C	74	124	68	51	30	19	14	3	3	5	1	2
Total	652	576	422	478	467	334	222	158	57	98	95	126
Average	217	192	141	159	156	111	74	53	19	33	32	42
All insects												
Zone A	1,232	1,890	1,780	1,439	1,110	857	598	363	390	326	521	823
Zone B	2,645	1,745	1,131	1,455	1,075	624	525	907	594	1,244	1,060	970
Zone C	2,551	3,309	2,553	1,786	1,602	467	353	425	260	485	208	249
Total	6,428	6,944	5,464	4,680	3,787	1,948	1,476	1,695	1,244	2,055	1,789	2,042
Average	2,143	2,315	1,821	1,560	1,262	649	492	565	415	685	596	681

TABLE 11.—Rainfall by zone and month, with the multiyear average above, and actual 1983–1984 measurements below.

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Average in mm														
Zone A	137	272	250	182	136	166	214	230	202	124	57	88	137	272
Zone B	124	202	225	164	117	144	171	232	177	119	59	71	124	202
Zone C	30	118	142	100	102	110	101	140	87	43	14	24	30	118
Total	291	592	617	446	355	420	486	602	466	286	130	183	291	592
Average	97	197	206	149	118	140	162	201	155	95	43	61	97	197
Actual—1983–1984 in mm														
Zone A	123	384	154	132	166	125	223	188	176	233	118	93	84	167
Zone B	123	179	148	89	113	130	134	155	174	185	81	94	82	159
Zone C	60	92	94	61	92	70	83	161	82	92	50	27	6	159
Total	306	655	396	282	371	325	440	504	432	510	249	214	172	485
Average	102	218	132	94	124	108	147	168	144	170	83	71	57	162



GRAPH 2.—Average monthly rainfall pattern at each of the 3 emergence trap zones.

Category 1. Antioquia alone: 56 species, 45%.

Category 2. Antioquia, plus other Departments in Colombia: 11 species, 9%.

Category 3. Antioquia/other Departments in Colombia, plus Ecuador/Peru and/or Venezuela: 25 species, 20%.

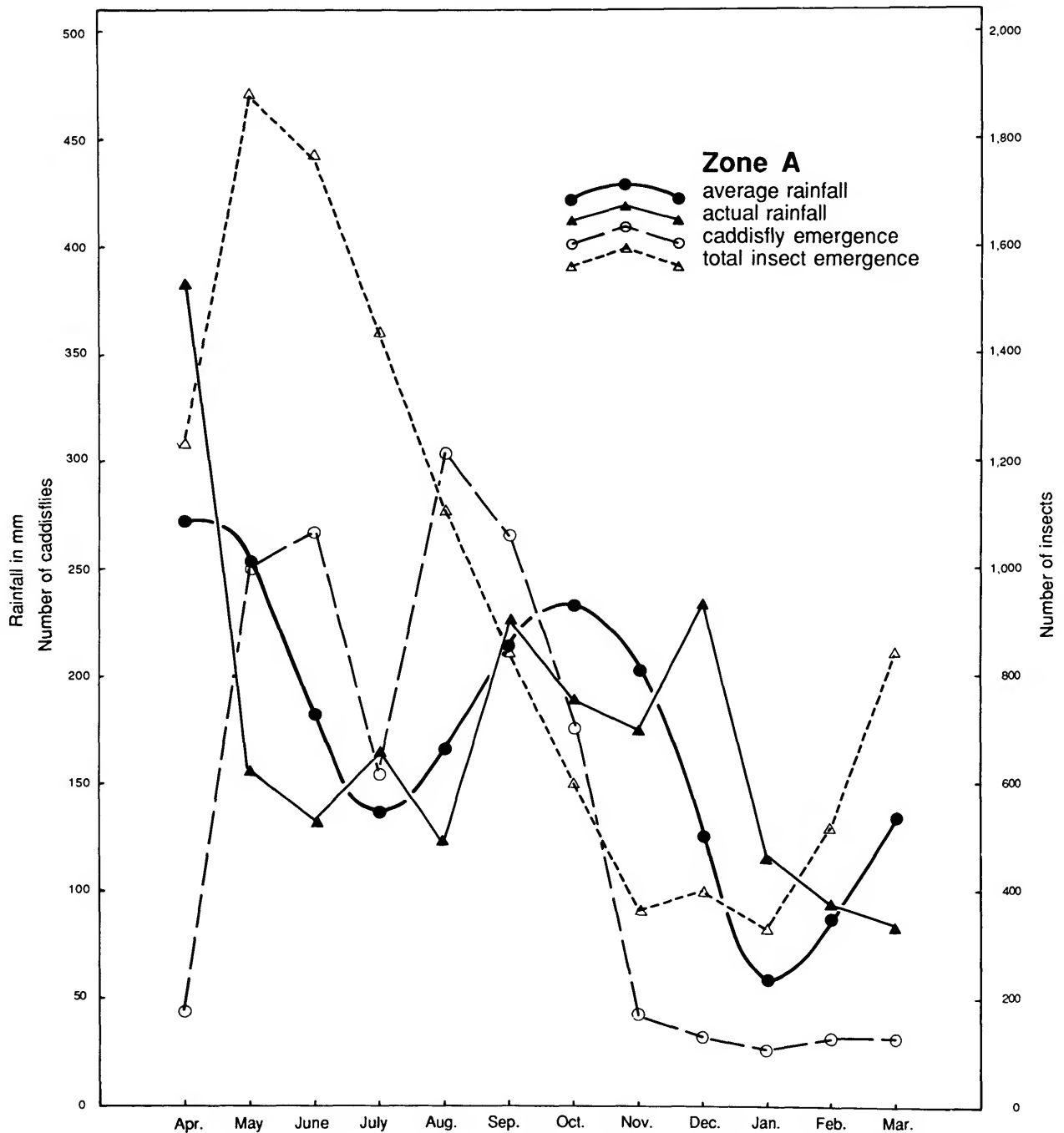
Category 4. Antioquia/other Departments in Colombia, plus Mexico/southern USA to Peru/Venezuela: 15 species, 12%.

Category 5. Antioquia/other Departments in Colombia, plus Central/South America, plus West Indies: 4 species, 3%.

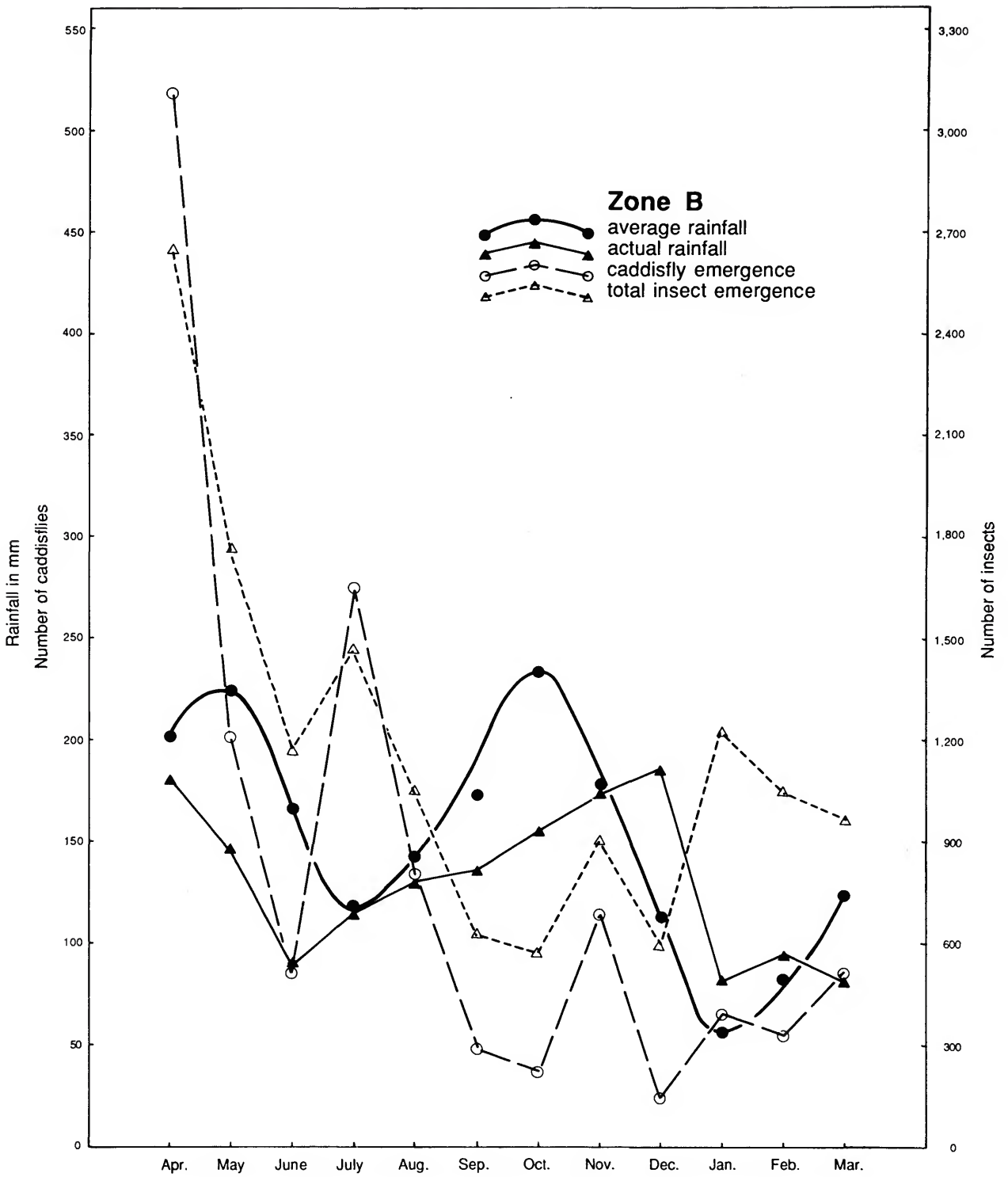
Category 6. Antioquia/other Departments in Colombia, plus southern Central America to Argentina/Brazil: 7 species, 6%.

Category 7. Antioquia/other Departments in Colombia, plus Canada/USA to Argentina/Brazil/Chile: 6 species, 5%.

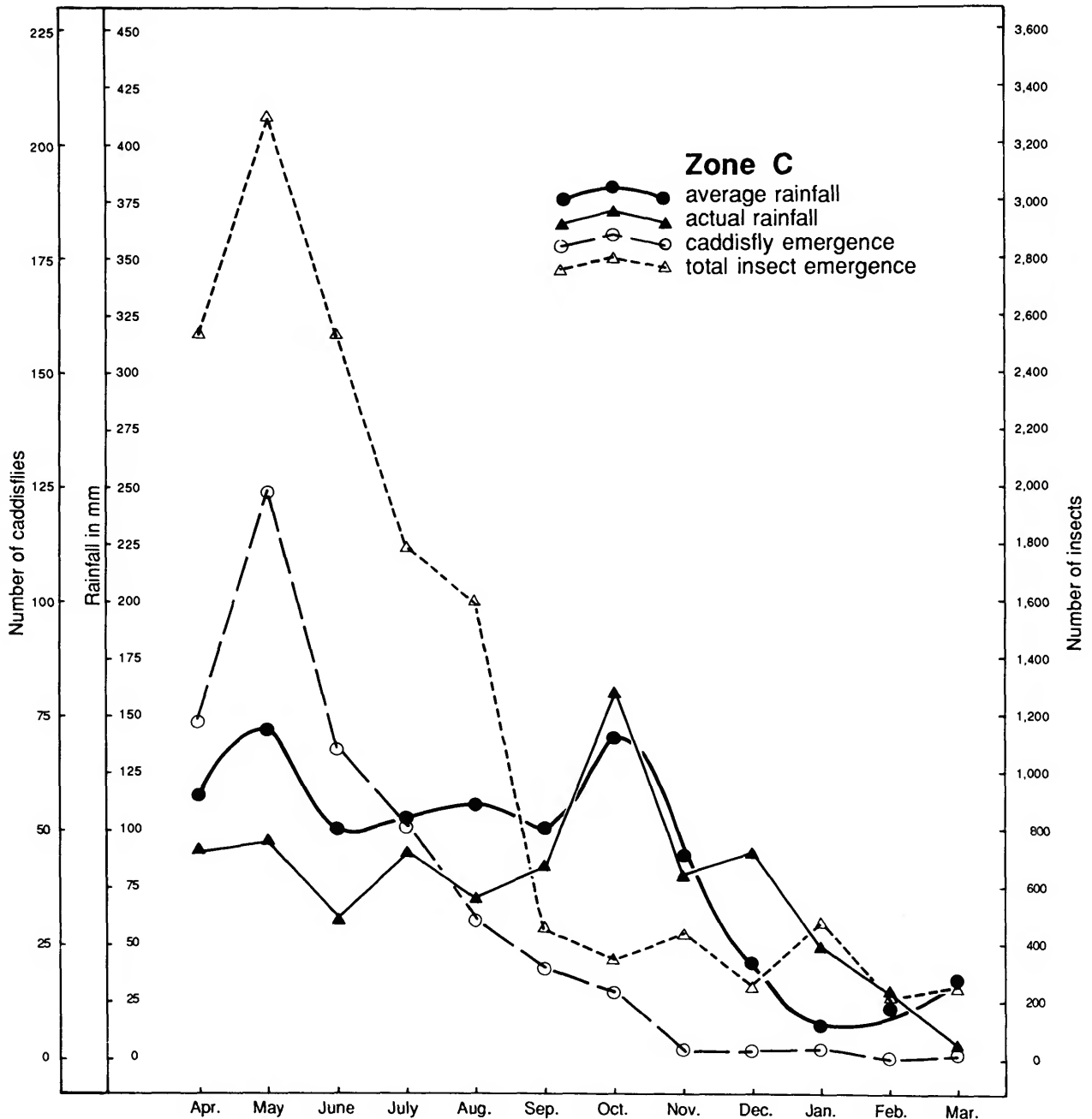
The fauna here reported is primarily one that was collected above 1,000 meters in elevation. Unfortunately, we have almost no lowland collections from Antioquia, such as could be made in the north of the Department or in the lowest elevations



GRAPH 3.—Comparison for Zone A of average monthly rainfall with 1983-1984 actual data for rainfall and for caddisfly emergence and total insect emergence in trap.



GRAPH 4.—Comparison for Zone B of average monthly rainfall with 1983-1984 actual data for rainfall and for caddisfly emergence and total insect emergence in trap.

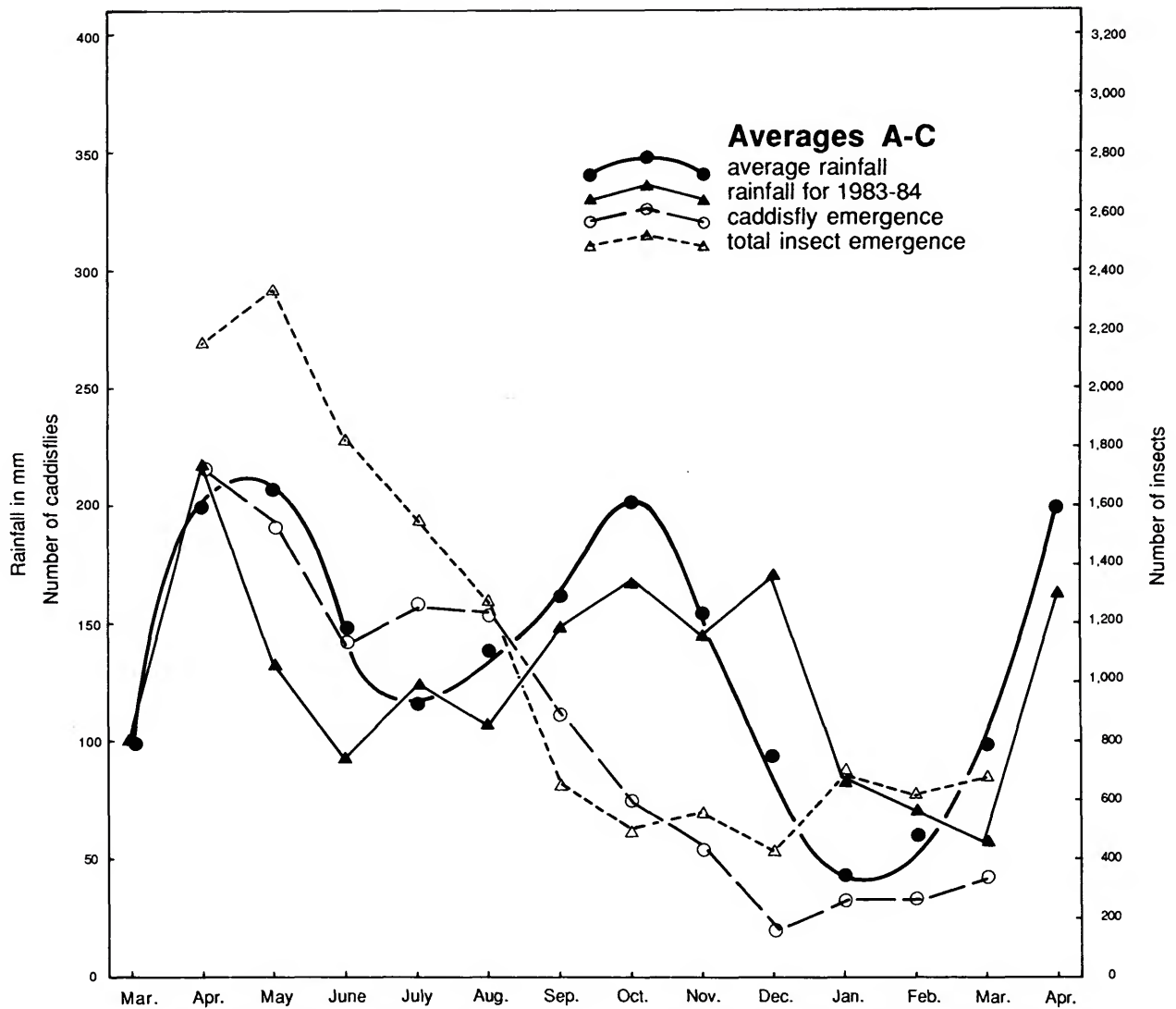


GRAPH 5.—Comparison for Zone C of average monthly rainfall with 1983–1984 actual data for rainfall and for caddisfly emergence and total insect emergence in trap.

along the Río Magdalena or Río Atrato. If these areas were also well sampled, unquestionably many more species of wide-spread distribution, such as are found in categories 4–7, would be found.

Nevertheless, at this point in our knowledge of the Neotropical fauna, 54% of the Antioquian fauna is limited to

Colombia alone. Adding those known from adjacent countries, what might be called a Northern Andean Fauna, we reach nearly $\frac{3}{4}$ of the total number of species. It is certain that with more collecting in other regions of Colombia and adjacent countries many of the species currently known only from Antioquia will be found to have this larger distributional pattern.



GRAPH 6.—Comparison for Zones A-C combined of average monthly rainfall with 1983-1984 actual data for rainfall and for caddisfly emergence and total insect emergence in trap.

Key to Families of Colombian Trichoptera

1. Mesoscutellum composed of a triangular, flat area, with a vertical posterior margin; forewing length 1.5-4 mm **HYDROPTILIDAE**
- Mesoscutellum evenly convex, without a vertical posterior margin; forewing length generally over 4 mm, rarely less than 2 mm 2
2. Ocelli present 3
- Ocelli absent 7
3. Maxillary palpus with fifth segment 2-3 times as long as fourth segment **PHILOPOTAMIDAE**
- Maxillary palpus either with less than 5 segments or with fifth segment barely longer than fourth 4
4. Foreleg with 2 apical spurs **HYDROBIOSIDAE**
- Foreleg with 1 apical spur, or lacking all spurs 5

5. Midleg with a pair of preapical spurs **GLOSSOSOMATIDAE**
Midleg lacking preapical spurs 6
6. Foreleg with a single, well-developed apical spur; midleg with 1 or no preapical spurs **LIMNAPHILIDAE**
Foreleg lacking or with 1 hairlike apical spur; midleg with 2 preapical spurs **ANOMALOPSYCHIDAE**
7. Maxillary palpus with terminal segment much longer than preceding segment and generally with suture-like cross-striae, or palpi lacking 8
Terminal palpal segment subequal to preceding segment, without cross striations 11
8. Mesoscutum lacking setal warts **HYDROPSYCHIDAE**
Mesoscutum with distinct setal warts or with a quadrangular anteromesal plate delineated by sutures 9
9. Forewing with R_1 forked apically **ECNOMIDAE**
Forewing with R_1 unbranched 10
10. Mesoscutellum with distinct setal warts **PSYCHOMYIIDAE**
Mesoscutellum with a quadrangular, anteromesal plate delineated by sutures **XIPHOCENTRONIDAE**
11. Forewing with a distinct crossvein between M_2 and M_3 **CALAMOCERATIDAE**
Forewing lacking a crossvein between anterior and posterior branches of M 12
12. Midtibia with preapical spurs **ODONTOCERIDAE**
Midtibia lacking preapical spurs 13
13. Hindwing basally with a row of hooked setae along anterior margin **HELICOPSYCHIDAE**
Hindwing lacking such a row of hooked setae **LEPTOCERIDAE**

Family HYDROBIOSIDAE

This recently recognized family (Schmid, 1980, 1989; Neboiss, 1981) is found in Australia, New Zealand, their surrounding islands, and as far north as the Himalayan mountains in the Old World, as well as in South and Central America into the southwestern United States in the New. The recent worldwide revision (Schmid, 1989) of the family recognizes 48 extant genera, 26 restricted to the Old World and 22 to the New. Only the genus *Atopsyche* has been recorded from Colombia, but its subgenus *Dolochorema* probably occurs at high elevations in the Andes. The genus *Cailloma* which is known from Ecuador, might also occur in southern Colombia.

Genus *Atopsyche* Banks

This is the largest and most widely distributed genus of the family in the New World. It contains just over 100 described species ranging from the southwestern United States to central Argentina, including the Greater Antilles. Males of only two species were taken in Antioquia, but the females of 4 additional species were taken, one of which also emerged in one of the traps.

The immature stages are well known (Flint, 1963; Wiggins, 1977; Correa et al., 1981). They are apparently free-living predators on other aquatic organisms.

Key to Antioquian Species of *Atopsyche*

- Paracercus slender, apex bifid *A. callosa* (Navás)
Paracercus broad, with 2 dorsal spines and an apicoventral, rounded lobe
. *A. tampurimac* Schmid

Atopsyche callosa (Navás)

FIGURE 2

Ventrarma callosa Navás, 1924:78.

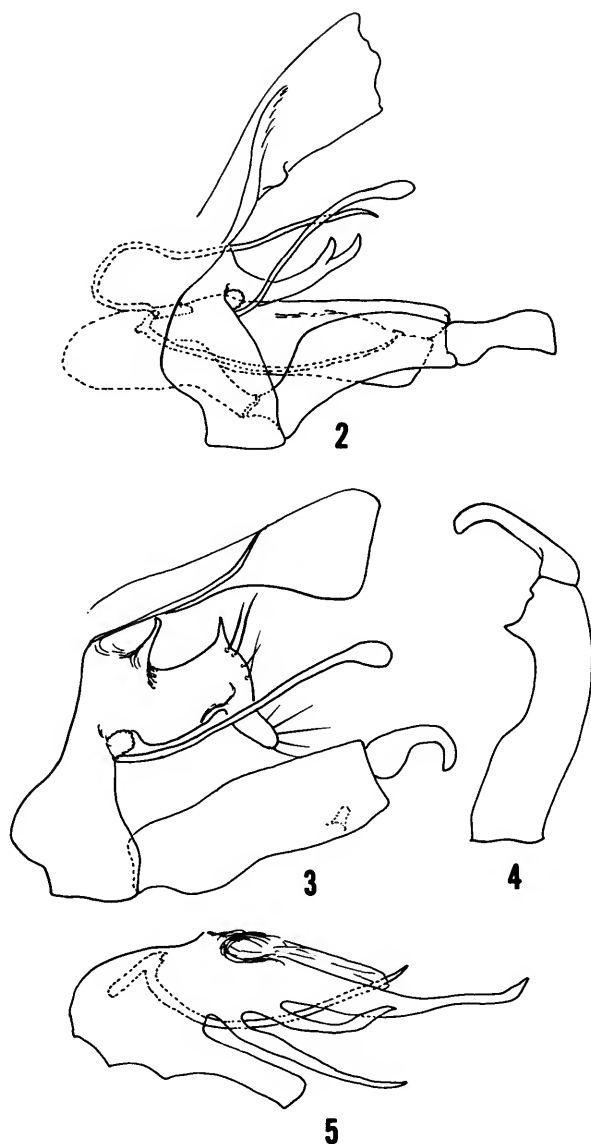
Atopsychealconeura Ross, 1953:292.—Flint, 1963:458 [synonymy].

Atopsyche schmidii Denning, 1965:267.—Flint, 1975:566 [synonymy].

This is one of the commonest, most widespread species of

the genus. It is recorded from Costa Rica south into Peru, and east across northern Venezuela. It is the most frequently encountered species of the genus in Antioquia.

MATERIAL.—COLOMBIA, DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 20 Jul 1983, U. Matthias, 1♀. Quebrada La Ayurá, Envigado (trap B), May 1983–Apr 1984, U. Matthias, 3♂, 4♀. Río Aurrá at km 50, San Jerónimo, 14



FIGURES 2-5.—*Atopsyche callosa* (Navás): 2, male genitalia, lateral. *A. tampurimac* Schmid: 3, male genitalia, lateral; 4, clasper, ventral; 5, phallus, lateral.

Feb 1983, O.S. Flint, Jr., 1♂, 3♀. Quebrada Honda, Marsella [12km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 1♂; same, but 3-4 Mar 1984, C.M. & O.S. Flint, Jr., 1♀. Río Medellín, 5 km S Caldas, 16 Feb 1983, O.S. Flint, Jr., 3♀; same, but 6 km S Caldas, 24 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada Espadera, 7 km E Medellín [road to Santa Elena], 24 Feb 1983, O.S. Flint, Jr., 1♂; same, but 4 Mar 1984, C.M. & O.S. Flint, Jr., 2♂, 1♀. Quebrada La Mosca, 1 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 3♀. Quebrada La Agudelo, 2 km E

El Retiro, 8 Feb 1983, O.S. Flint, Jr., 5♀. Examples are also known from the Departments of Meta, Risaralda, and Santander in Colombia as well as Costa Rica, Panama, Venezuela, Ecuador, and Peru.

Atopsyche tampurimac Schmid

FIGURES 3-5

Atopsyche tampurimac Schmid, 1989:130.

This recently described species is very closely related to *A. banksi* Ross of which a second male was recently taken near Santa Rosa de Cabal, Risaralda, Colombia. This second specimen agrees perfectly with the type of *A. banksi*, and differs from the material from Antioquia which was at first thought to be *A. banksi*. The type of *A. tampurimac* is from northern Ecuador and is nearly identical to this Antioquian material; the species apparently has a considerable range in the northern Andes.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [on road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♂, 1♀; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 2♂, 1♀.

Atopsyche species

The collections contain females of four additional species that are easily distinguished by internal genitalia. For one species, "A," a tentative identification is suggested; the others are wholly unassociated. However, the presence of these females indicates a much more diverse fauna than the males alone would suggest.

Atopsyche species A

This moderately large, dark species is only known from a few females, unassociated with any males. They have all been taken at around 2500 m elevation in the uplands to the east of Medellín. An additional 3 females were taken in Risaralda at the Termales de Santa Rosa de Cabal. A single male, taken at a light between the Termales and Santa Rosa, and which agrees in general size and coloration to the females, is referable to *A. mayucapac* Schmid. It differs slightly in the shape of the tip of the paracercus and dorsal process of the aedeagus from topotypic examples. However, lacking males from the vicinity of Medellín, I prefer to leave the species unnamed at the present only pointing out the possible identity.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 15 Sep 1983, U. Matthias, 1♀. Quebrada La Agudelo, 2 km E El Retiro, 8 Feb 1983, O.S. Flint, Jr., 2♀. DPTO. RISARALDA: Termales de Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 3♀.

Atopsyche species B

A single female of this species is known. The forewing is 9

mm long, and the color is basically brown, with the posterior half of the forewing with many paler brown setae.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 10 km E Medellín [road to Las Palmas], 6 Feb 1983, O.S. Flint, Jr., 1♀.

Atopsyche species C

This female has forewings 10 mm long and is dark brown with the forewing almost uniformly dark brown.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Mosca, 1 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 1♀.

Atopsyche species D

This female is identical in appearance to species C, differing only in its genitalia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♀.

Family GLOSSOSOMATIDAE

The family has members in nearly all parts of the world. With the exception of *Glossosoma*, which occurs in northern Mexico, all the Neotropical genera belong to the subfamily Protoptilinae, which is restricted to the New World and eastern Asia. Of the 13 Neotropical genera, 3 are restricted to the Chilean Subregion and another 3 to the Greater Antilles. Only 3 genera are known from Colombia, with all 3 having representatives in Antioquia.

The larva construct cases made of small sand grains in the form of a turtle's shell, that is, a domed dorsal portion and a flat, midventral strap. Anterior and posterior openings are left on the venter through which the larva protrudes to grasp the substrate. The larvae inhabit all types of lotic habitats, most species preferring fast, cool streams with a good gravel or rock substrate. They appear to feed on the periphyton that they scrape off the bottom.

Key to Antioquian Genera of Glossosomatidae

1. Three branches of M in forewing (Ross, 1956a, Fig. 367) *Protoptila*
Two branches of M in forewing (Ross, 1956a, Fig. 365) 2
2. Cu₁ branched apically in hindwing *Mortoniella*
Cu₁ unbranched in hindwing *Mexitrichia*

Genus *Mexitrichia* Mosely

This is a common and widespread genus in most hilly or mountainous areas of the Neotropics. Almost 25 species have now been described from Mexico, Central America, and South America as far south as west-central Argentina. Four species

have been found in Antioquia, and another two recorded from other areas of the country, an indication that more species are to be found in Antioquia.

The larvae were described by Flint (1963). They inhabit turtle-shell shaped cases made of small sand grains. Apparently they scrape periphyton off the substrate in lotic situations.

Key to Antioquian Species of *Mexitrichia*

1. Fore- and hindwings with flattened, scale-like hairs 2
Wings with only normal hairs 3
2. Tenth tergum with curved dorsolateral arms, extending well beyond an abbreviated, vertical ventrolateral lobe *M. velasquezi*, new species
Tenth tergum produced into a small apicolateral lobe and a small ventral lobe *M. leei* Flint
3. Aedeagal complex with lateral process long, tapering to a sharp point, basolateral lobe lacking a dorsal process *M. elongata* Flint
Aedeagal complex with lateral process long, apices angled mesad and bearing a series of spinules, basolateral lobe with an angled dorsal process, spinulate at angulation *M. spinulata*, new species

Mexitrichia elongata Flint

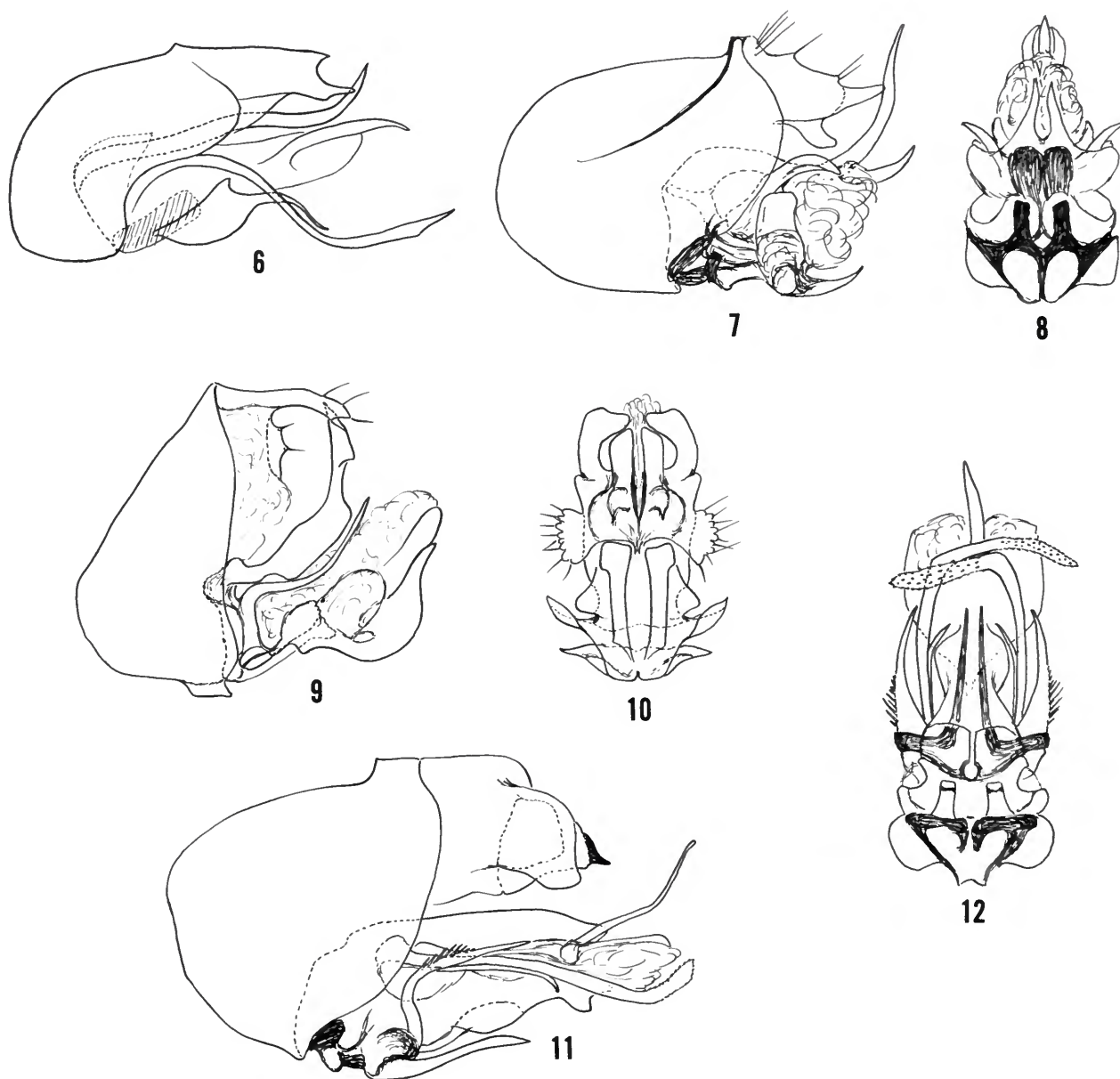
FIGURE 6

Mexitrichia elongata Flint, 1963:474.

This species was described from the Department of Valle del

Cauca in southern Colombia and is now recorded from Antioquia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Ayurá, Envigado (trap B), 8 Aug 1983, U. Matthias, 1♂, 1♀; 20–28 Apr 1984, 1♂, 1♀. Quebrada Honda, Marsella [12



FIGURES 6-12.—*Mexitrichia elongata* Flint: 6, male genitalia, lateral. *M. leei* Flint: 7, male genitalia, lateral; 8, phallic complex, ventral. *M. velasquezi*, new species: 9, male genitalia, lateral; 10, phallic complex, ventral. *M. spinulata*, new species: 11, male genitalia, lateral; 12, phallic complex, ventral.

km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 2♂; same, but 3-4 Mar 1984, C.M. & O.S. Flint, Jr., 1♀.

***Mexitrichia leei* Flint**

FIGURES 7, 8

Mexitrichia leei Flint, 1974a:12.

This species was described from the coast of the Department of Valle del Cauca in Colombia. It is here recorded from the Departments of Antioquia and Chocó.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Río Claro [near Río Magdalena on Medellín-Bogotá highway], 3 May 1984, U. Matthias, 1♂. DPTO. CHOCÓ: Río Atrato, Yuto, 18 Feb 1983, O.S. Flint, Jr., 22♂, 10♀.

Mexitrichia velasquezii, new species

FIGURES 9, 10

This is a very distinctive species of obscure relationship. The presence of flattened, scale-like hairs on the fore and hind wings of the male suggest a relationship to *M. leei* Flint, which also has a deeply divided tenth tergum. However, the very narrow lateral lobes of the tenth tergum and processes of the aedeagal complex are unique.

ADULT.—Length of forewing, 3–4 mm. Color brownish-black; forewing with an indistinct, white, transverse band over chord, ending with a white spot on posterior margin; male with inner surface of forewing and outer of hindwing covered with flattened, scale-like hairs. Sixth sternum with a pointed, apicomeral process. *Male genitalia*: Ninth segment expanded anteroventrally; posterior margin nearly vertical. Tenth tergum in lateral aspect with a slender, lateral process, with a thin, ventrobasal expansion; in dorsal aspect, with a broad, deep, mesal excision. Aedeagal complex small basally; with an upcurved dorsomesal process, pointed apically; with a slender lateral process; central tube with basoventral rods long, inflated apicad, with a pair of apicoventral submesal lobes, developed into a thin but rather deep mesal portion, apicolaterally with a thin, flared lobe, center membranous.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Río Aurrá at km 50, E San Jerónimo, 22 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 1♂, 5♀; same, but 14 Feb 1983, O.S. Flint, Jr., 63♂, 134♀. "Finca Velásquez," Sopetrán, 14 Feb 1983, O.S. Flint, Jr., 2♂. Quebrada Honda, Marsella [12 km SW Fredonia], 3–4 Mar 1984, C.M. & O.S. Flint, Jr., 1♀. Quebrada El Pozo, 8 km W El Peñol, 9 Feb 1983, O.S. Flint, Jr., 20♂, 9♀.

Mexitrichia spinulata, new species

FIGURES 11, 12

This species is related to *M. guairica* Flint, but is easily distinguished by the structure of the male genitalia, especially the aedeagal complex. Distinctive is the pair of elongate,

ventromesal processes and shape and length of the entire aedeagal complex and its processes.

ADULT.—Length of forewing, male, 3–4 mm, female, 4 mm. Color fuscous, appendages slightly paler; forewing fuscous with distinct, transverse, white line at level of chord. Sixth sternum with a pointed, apicomeral process. *Male genitalia*: Ninth segment with anterior margin evenly rounded; posterior margin slightly curved. Tenth tergum with lateral winglike lobe, and a pair of pointed, black, submesal processes. Aedeagal complex with dorsomesal process attached to center of tube subapically, and what appears to be the slender apical extension may be the typical apical spine of the tube; lateral process long, apex curved across midline and bearing dark spinules, a second slender, dark tipped spine lying mesally of lateral process; central tube with basolateral lobe produced into a lightly sclerotized process bearing a series of dark spines at dorsal angulation, tip pale, with basomesal lobe produced into a slender, straight process, tube elongate, sclerotized basolaterally.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [on road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 3♂; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 2♀.

Genus *Mortoniella* Ulmer

Fewer than ten species have been described in the genus up to now. However, more extensive collections in the Andes will undoubtedly greatly increase the number of included species. I know species in the Andes from northern Venezuela south throughout the mountains to northwestern Argentina. Four species are here recorded from Antioquia.

The larvae have been described several times (Correa et al., 1981; Flint, 1963). They inhabit turtle-shell shaped cases, as do all the other genera in the family. However, they tend to use larger pieces of sand than does *Mexitrichia*, but not to use the large lateral stone as does *Protopiila*. Apparently they graze on the periphyton growing on the substrate in fast, cool mountain streams.

Key to Antioquian Species of *Mortoniella*

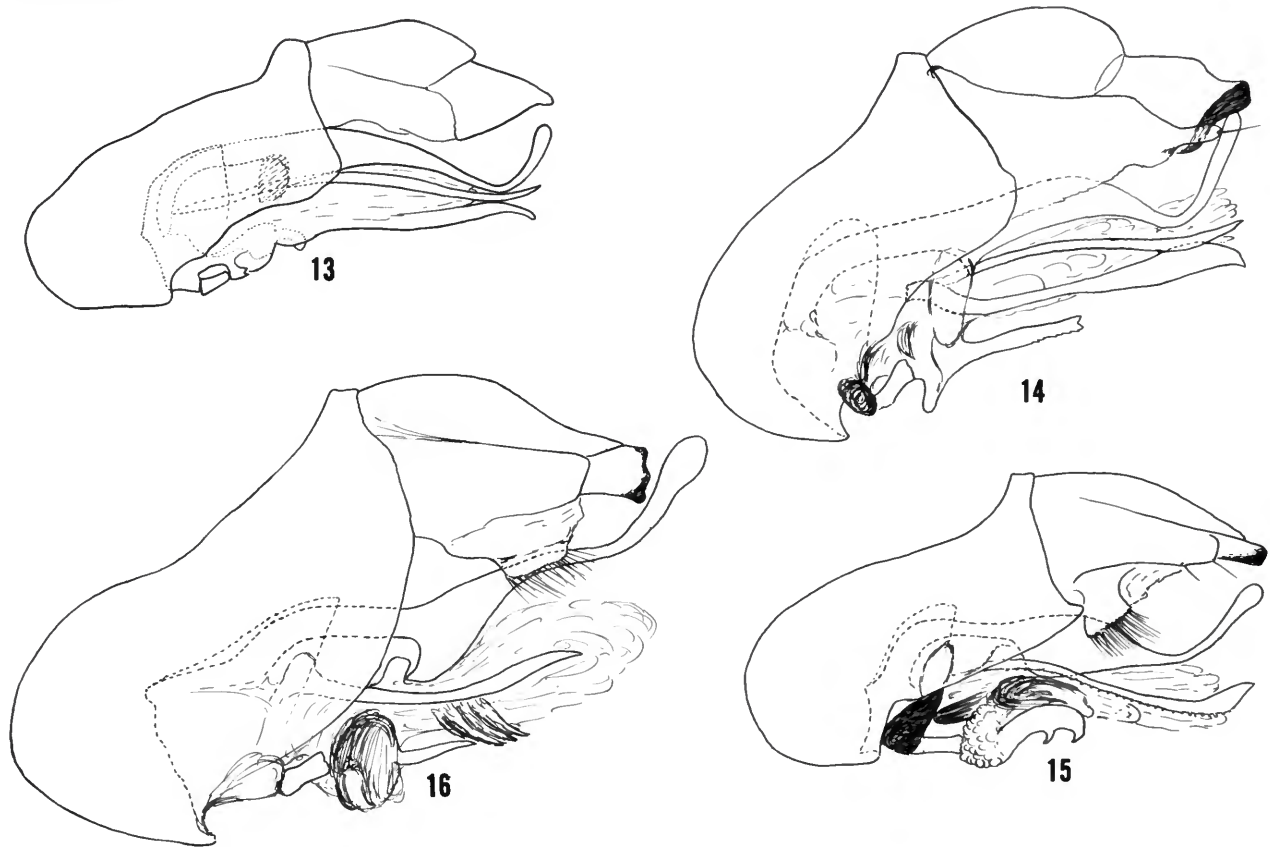
1. Forewing with 2 slender, transverse, white lines 2
Forewings either golden or with 2 transverse, iridescent, bluish bands 3
2. Aedeagal complex with basolateral lobe bearing an elongate process
. *M. roldani*, new species
Aedeagal complex lacking a process from basolateral lobe . . . *M. bilineata* Ulmer
3. Forewing uniformly golden in color *M. enchrysa*, new species
Forewing with 2 bluish, iridescent, transverse bands . . *M. iridescens*, new species

Mortoniella bilineata Ulmer

FIGURE 13

Mortoniella bilineata Ulmer, 1906:97–98.—Flint, 1963:466.

This species described, and heretofore known only from Ecuador, is now recorded from Colombia. It is common and frequently encountered in the small streams and rivers at higher elevations around Medellín.



FIGURES 13-16.—*Mortoniella bilineata* Ulmer: 13, male genitalia, lateral. *M. roldani*, new species: 14, male genitalia, lateral. *M. enchrysa*, new species: 15, male genitalia, lateral. *M. iridescens*, new species: 16, male genitalia, lateral.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Río Medellín, 6 km south Caldas, 24 Feb 1984, C.M. & O.S. Flint, Jr., 14♂, 2♀; same, but 5 km S Caldas, 16 Feb 1983, 11♂, 5♀; same, but Estación Primavera, 1600 m, 30 Aug 1983, U. Mathias, 3♂. Quebrada La Agudelo, 2 km E El Retiro, 8 Feb 1983, O.S. Flint, Jr., 4♂, 8♀; same, but 25 Feb 1984, 34♂, 50♀. Quebrada Potrereros, W La Fé, 19 Feb 1984, C.M. and O.S. Flint, Jr., 39♂, 34♀; 26 Feb 1984, 25♂, 84♀. Quebrada La Mosca, 1 km W Guarne, 2 Mar 1984, C.M. & O.S. Flint, Jr., 24♂, 16♀; same, but 7 Feb 1983, O.S. Flint, Jr., 7♀. Río Aurrá [at km 50], E San Jerónimo, 22 Feb 1984, C.M. & O.S. Flint, Jr., 14♂, 8♀; same, but 14 Feb 1983, O.S. Flint, Jr., 1♂.

***Mortoniella roldani*, new species**

FIGURE 14

This species is almost identical in most aspects of appearance and male genitalia to *M. bilineata* Ulmer. It is only to be distinguished in the male genitalia, especially by the possession of a process beneath the central tube from the basolateral lobe.

ADULT.—Length of forewing, male, 3-3.5 mm, female, 3.5-4 mm. Color fuscous; forewing fuscous with two transverse white bands (at a certain angle these have bluish, opalescent reflections), apical one at chord, other midway between chord and base. Sixth sternum of male with a pointed apicomeresal process. *Male genitalia*: Ninth segment with anterior margin rounded and produced anteroventrally; posterior margin nearly vertical for upper half, lower half very oblique. Tenth tergum with apical lobes narrowly divided mesally, with apicolateral margin darkened; lateral lobe lightly sclerotized, ending in a slender process. Aedeagal complex with a single dorsomesal process whose tip is angled dorsad, and slender, pointed, paired lateral and lateroventral processes, basolateral lobe bearing a slender process.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Río Aurrá at km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 4♂, 12♀. DPTO. META: Quebrada Blanca, 3 km W Restrepo, 11 Feb 1983, O.S. Flint, Jr., 158♂, 153♀.

Mortoniella enchrysa, new species

FIGURE 15

This is the only species in the genus that I have seen which is covered with golden hair and lacks the two transverse white lines on the forewing. The male genitalia are also distinctive. The hirsute basoventral lobe of the tenth tergum, and clawlike ventral process of the aedeagal complex are distinctive.

ADULT.—Length of forewing, 5–6.5 mm. Color golden; body pale brown; forewing, head and thorax covered with golden hairs; hindwing fuscous. Sixth sternum of male with a small apicomeresal process. *Male genitalia*: Ninth segment with anterior margin rounded and produced anteroventrally; posterior margin produced into a midlateral acute angle. Tenth tergum with apical lobes well divided mesally with apicolateral margin darkened; lateral lobe lightly sclerotized, apex rounded; with a hirsute ventrolateral lobe. Aedeagal complex with a single dorsomesal process, enlarged at midlength, and with tip narrow and angled dorsad; lateral process long, pointed; ventral margin bearing small teeth; with a lateroventral rounded lobe, beneath which is an elongate process ending in 2 strong, ventrally-directed teeth.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. RISARALDA: Termales de Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 4♂. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), May 21–June 5 1983, U. Matthias, 2♀. Quebrada La Ayurá, Envigado (trap B), 28 Apr 1983–24 Jan 1984, U. Matthias, 3♂, 3♀. Quebrada La García, 20 km NE Medellín [road to San Pedro], 13 Feb 1983, O.S. Flint, Jr., 2♀. Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♀. DPTO. VALLE DEL CAUCA: Río Melendez, Villacarmelo, 1540 m, 15 Apr 1985, A.D. Quintero, 1♂.

Mortoniella iridescens, new species

FIGURE 16

At first sight this is an entirely black species, but at the

proper angle two brilliant, bluish-white transverse lines flash into view across the forewings, at the positions of the usual 2 white bands in other species in the genus. In addition the male genitalia offer a number of distinctive characteristics in the tenth tergum and aedeagal complex.

ADULT.—Length of forewing, 5 mm. Color black; forewing generally appearing black, but at proper angle two brilliant, transverse, bluish-white iridescent bands appear. Sixth sternum of male with a pointed apicomeresal process. *Male genitalia*: Ninth segment with anterior margin rounded and produced anteroventrally; posterior margin retracted ventrally, dorsal two-thirds nearly vertical. Tenth tergum with apical lobe truncate in lateral aspect, with a small U-shaped dorsomesal excision; lateral lobe lightly sclerotized, apex obliquely truncate; ventrally with a narrow, hirsute lobe. Aedeagal complex with a single dorsomesal process, enlarged before midlength, with tip narrow and curved dorsad; lateral process pointed, about half length of dorsal process; with a pair of short, pointed ventral processes; central tube with a ventrolateral hirsute lobe.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km N Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 3♂. Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 14 Feb 1983, O.S. Flint, Jr., 2♂.

Genus *Protophila* Banks

This is a genus of more than 75 described species, found from southern Canada throughout North, Central, and South America, but notably lacking from the Chilean Subregion and the Greater Antilles, although it is found in the Lesser Antilles.

The larvae are well known, being described by Ross (1944), Wiggins (1977), and Correa et al. (1981), among others. They too produce turtle-shell shaped larval cases. In general they use a large sand grain to form the side of the case, with small grains between. They also scrape periphyton from the substrate, but are more ecologically tolerant, being found in any lotic situation including large lowland rivers.

Key to Antioquian Species of *Protophila*

- Tenth tergum with a long, arched, fimbriate dorsal process *P. fimbriata* Flint
 Tenth tergum lacking any such process *P. voluta*, new species

Protophila fimbriata Flint

FIGURE 17

Protophila fimbriata Flint, 1981a:8.

These Colombian examples, both males and females, agree closely with this species recently described from northern Venezuela. All the structures of the male genitalia are identical,

but exact shapes of apical portions of many structures differ slightly in detail.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 22 Feb 1983, O.S. Flint, Jr. 8♂, 13♀. Río Aurrá at km 50, E San Jerónimo, 22 Feb 1984, C.M. & O.S. Flint, Jr., 4♂, 24♀. DPTO. META: Quebrada Blanca, 3 km W Restrepo, 11 Feb 1983, O.S. Flint, Jr., 2♂, 7♀.

Protoptila voluta, new species

FIGURE 18

This species is another member of the *condylifera* complex, closest to *P. ignera* Flint from Trinidad. From this, *P. voluta* is to be recognized by the slightly different shapes of the ninth sternum, tenth tergum, and especially in the aedeagus whose curved lateral processes almost reach the tip of the ninth sternum and whose dorsal spines are quite differently shaped.

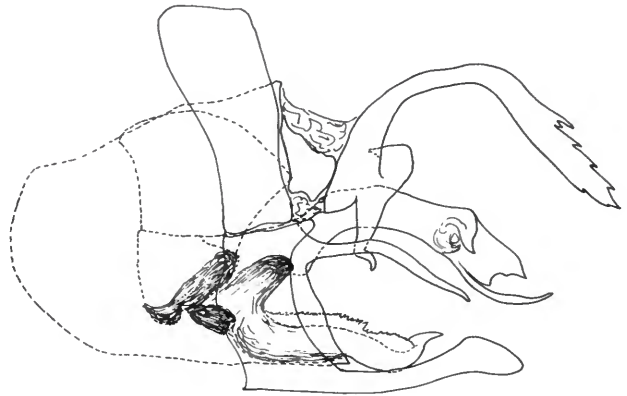
ADULT.—Length of forewing, 3–3.5 mm. Color in alcohol, uniformly light brown. Sixth sternum with a short, pointed, compressed, apicomeral process. *Male genitalia*: Eighth sternum produced posteromesally, apex bifid. Ninth sternum produced and projecting above eighth sternum; tip with a small apicoventral tooth, broadly and shallowly emarginate in ventral aspect. Tenth tergum with basal section nearly quadrate; apical section produced and rounded apicoventrally, with a small apicomeral tooth. Aedeagus with typical basal lobes and midlength complex whose curving lateral processes almost attain apex of ninth sternum; central tube just beyond tenth tergum bearing a pair of dorsal spines twisted mesad and ventrad, apical tube slightly enlarged apicad with a small internal spine.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), 5–22 May 1983, U. Matthias. USNM Type.

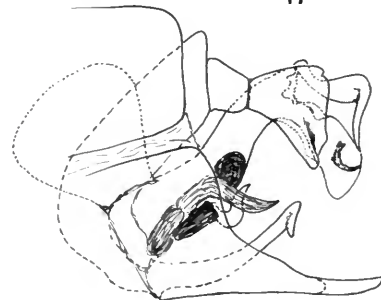
Paratypes: Same data as holotype, 1♂, 3♀; 2 Jun 1983, 1♀; 4 Jul 1983, 1♀.

Family PHILOPOTAMIDAE

The philopotamids are worldwide in distribution, being found in all types of running waters. Their larvae all, as far as is known, construct silken, fingerlike tubes with which they filter their food from the passing water (Wallace and Malas, 1976). Although less than ten genera are recognized, some of



17



18

FIGURES 17–18.—*Protoptila fimbriata* Flint: 17, male genitalia, lateral. *P. voluta*, new species: 18, male genitalia, lateral.

them are very large and diverse, and are found in most faunal realms. Only four genera are recognized in the Neotropics, all occurring in Colombia except *Sortosa* which is limited to the Chilean Subregion and the mountains of southeastern Brazil.

Key to Antioquian Genera of Philopotamidae

- 1. Forewing with 4 branches to M; clasper 2-segmented *Wormaldia*
Forewing with 3 branches to M; clasper 1-segmented 2
- 2. Foretibia with 1 small apical spur *Chimarra*
Foretibia with 2 apical spurs, one almost twice as long as other
. *Chimarrhodella*

Genus *Chimarrhodella* Lestage

This is a genus of only four described species, all Neotropical in distribution. The species are limited to the Andes of northern and western South America from Venezuela to Bolivia, and the mountains of Panama.

The immature stages are unknown. I have only collected species near small streams in very wet forest areas in the mountains.

Chimarrhodella peruviana (Ross)

FIGURES 19–21

Protarra peruviana Ross, 1956a:69.

Chimarrhodella peruviana (Ross).—Flint, 1971b:20.

The genus is currently being revised by Roger Blahnik, University of Minnesota, who has studied this material, the types of *C. peruviana* (Ross) and *C. ulmeri* (Ross) and other relevant specimens. He finds the two very similar, and in some

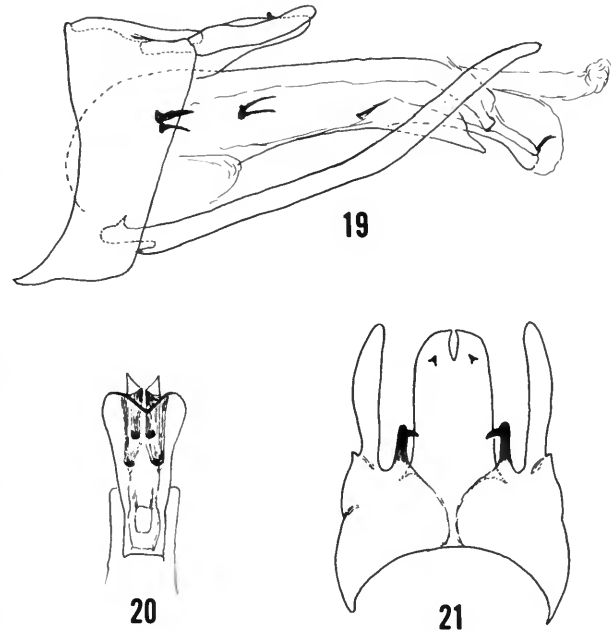
regions distinguishable by the color and minor genitalic differences, but in other regions (Bolivia) they seem to intergrade. Pending further studies and material, these Colombian examples are considered *C. peruviana* whose type they match most closely.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 12 km N of Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, 10♂, 1♀. 24 km NW Medellín [road to San Jerónimo], 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♀.

Genus *Chimarra* Stephens

This genus is widespread over the entire world, being especially diverse in the Tropics including many oceanic islands. They are found in the New World wherever there are flowing watercourses, from southern Canada to Central Argentina, including all the West Indies, but not the Chilean Subregion.

The larvae are well known and described from many areas of the world (Flint, 1968a, 1968b; Ross, 1944; Wiggins, 1977; Correa, et al., 1981). They produce slender, finger-like silken tubes attached to solid objects in the substrate. Studies have shown that they feed on detritus, algae, and small animals that the tubes filter from the water. In general, the larvae are found in smaller streams and rivers with solid objects in the substrate rather than in large muddy-bottomed rivers.



FIGURES 19-21.—*Chimarrhodella peruviana* (Ross): 19, male genitalia, lateral; 20, tip of phallus, dorsal; 21, ninth and tenth terga, dorsal.

Key to Antioquian Species of *Chimarra*

1. With contrasting colors: wings black, body orange . . . *C. margaritae*, new species
Uniformly black in color 2
2. Seventh and eighth abdominal terga with processes
. *C. septemlobata*, new species
Seventh and eighth terga lacking processes 3
3. Clasper in lateral aspect enlarged basad, either elongate or with a slender apicodorsal process, in ventral aspect curved and produced mesally 4
Clasper short, broadest apically with a row of stout setae, in posterior aspect with an apicodorsal point or small lobe 5
4. Clasper only slightly enlarged basoventrally, ventral margin sigmoid; in ventral aspect C-shaped, with lateral sides nearly parallel, apex truncate
. *C. duckworthi* Flint
Clasper basoventrally with a large lobe, bearing a slender dorsal process; in ventral aspect with dorsal process curved mesally, enlarged basally
. *C. platyrhina* Flint
5. Tenth tergum in dorsal aspect with a large lateral lobe extending from base to nearly midlength of tergite *C. decimlobata*, new species
Tenth tergum with lateral lobe arising at midlength, smaller in extent 6
6. Tenth tergum in dorsal aspect with lateral lobe directed posteriad beside lateral plate *C. onima*, new species
Tenth tergum with lateral lobe curved laterad only *C. emima* Ross

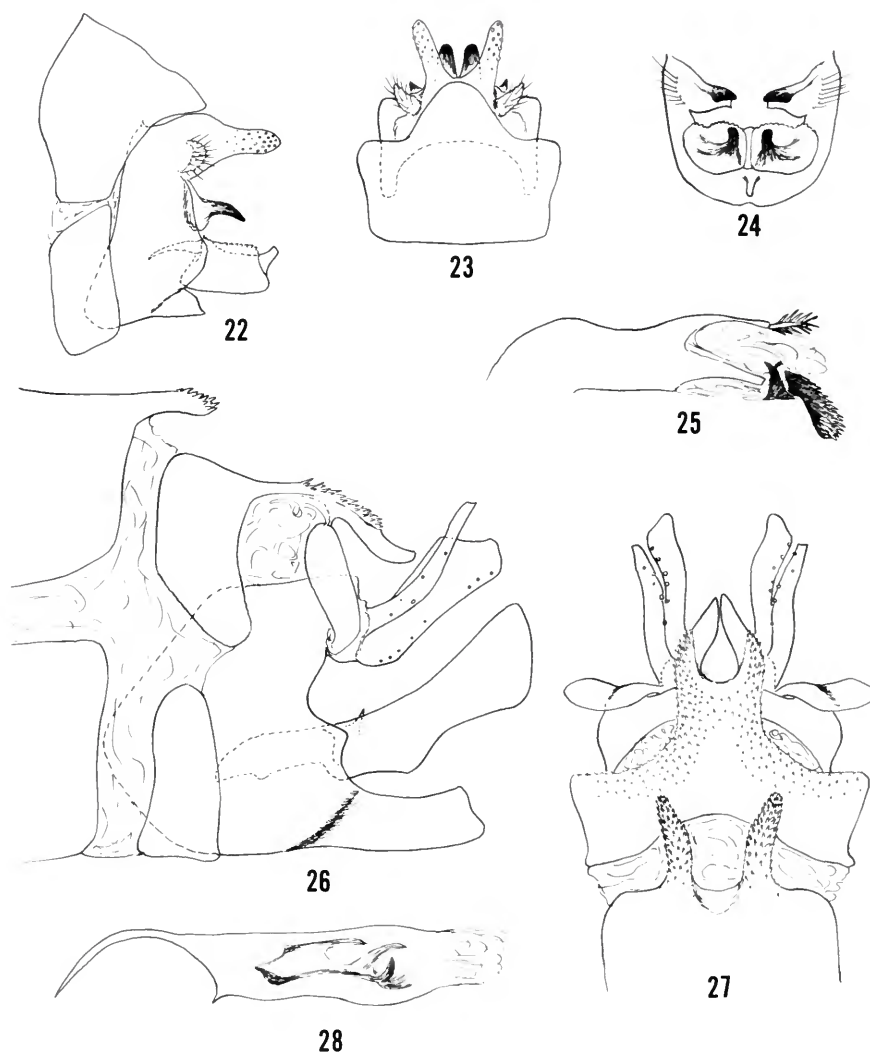
***Chimarra (Curgia) margaritae*, new species**

FIGURES 22-25

This very bright and attractive *Chimarra* is day active and

commonly seen fluttering around cascades and pools in small streams on the forested slopes around Medellín. I take great pleasure in dedicating it to Margarita María Correa Gómez.

Although the species corresponds in general to the typical



FIGURES 22-28.—*Chimarra (Curgia) margaritae*, new species: 22, male genitalia, lateral; 23, ninth and tenth terga, dorsal; 24, ninth segment and claspers, posterior; 25, phallus, lateral. *C. (Chimarra) septemlobata*, new species: 26, male genitalia, lateral; 27, seventh through tenth terga, dorsal; 28, phallus, lateral.

plan of the subgenus *Curgia* it is unique in the subgenus by having a divided tenth tergum. The blackened process from the posterior margin of the ninth segment is very different from anything elsewhere as are the apicoventral scabrous lobes of the phallus.

ADULT.—Length of forewing, 6.5–9 mm. Color black and orange: head, thorax, abdomen, coxae, and femora orange; antennae, palpi, tibiae, tarsi, and wings black. Forewing without a bulla in the radial system; hindwing with 4 branches to Rs, and 3 to M. *Male genitalia*: Eighth sternum nearly parallel-sided; tergum produced posteromesally into a broad, rounded lobe. Ninth sternum slightly produced anteroventrally, posteroventral keel well developed; with a blackened process from posterior margin between clasper and tenth tergum.

Cercus a small, ovoid lobe. Tenth tergum in lateral aspect an elongate, rounded rod, in dorsal aspect deeply divided mesally; each lobe with many sensillae. Clasper rather rectanguloid in lateral aspect, dorsal margin serrulate, with a distinct, upright, apicomasal lobe. Phallus tubular, inflected basally, apex membranous, but with sclerotized dorso- and ventrolateral bands; apex dorsally with a transverse band of dark, small spines, ventrally with dark, paired sclerites bearing many spicules, and arising from a sclerotized basal structure (none of these apical structures is apparently retractable).

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km NW Medellín [road to San Pedro], 13 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 22♂, 5♀; same, but 20

Feb 1984, C.M. and O.S. Flint, Jr., 7♂, 3♀. Quebrada Bocana 8 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint Jr., 1♂. 12 km E Medellín [road to Sta. Elena], 6 Feb 1983 O.S. Flint, Jr., 6♂, 1♀. 24 km NW of Medellín [road to San Jerónimo], 22 Feb 1984, C.M. & O.S. Flint, Jr., 2♀. 27 km NW of Medellín [road to San Jerónimo], 23 Feb 1984, C.M. & O.S. Flint, Jr., 10♂, 4♀. 12 km N Fredonia [road to Medellín], 2 Feb 1983, 2000 m, O.S. Flint, Jr., 4♂, 2♀. Quebrada Cocorná Aug 1981, R. Vélez, 6♂, 3♀ (UNCM); same, but A. Madriga C., 2♂, 1♀ (UNCM); same, but Jul 1980, A.M. del Corral, 1♂ (UNCM). San Luis, Sep 1980, A.M. del Corral, 3♂ (UNCM) DPTO. VALLE DEL CAUCA: Topacio, 1600 m, 13 Sep 1985 A.D. Quintero, 6♂, 3♀.

Chimarra (Chimarra) septemlobata, new species

FIGURES 26–28

This is an isolated species of the *patosa* group, with some relationship to *C. (C.) septifera* Flint and *C. (C.) retrorsa* Flint both of which also have the tenth tergum divided into 2 pairs of processes. From these and all other New World species of the genus, *C. (C.) septemlobata* is immediately recognized by the presence of processes on the seventh abdominal tergum as well as the eighth. In addition, the shapes of the eighth terga processes, the tenth tergites, claspers, and internal sclerites of the phallus all offer good characteristics to distinguish this species.

ADULT.—Length of forewing, 5.5–6 mm. Color uniform; fuscous. Forewing without a well developed bulla in radia system; hindwing with 3 branches to Rs and 2 to M. *Male genitalia:* Seventh tergum with a pair of scabrous, submesa processes from posterior margin. Eighth tergum with an elongate, scabrous process posteromesally whose tip is deeply divided and smooth. Ninth segment broad laterally; with a long, broad, posteroventral process mesally. Tenth tergum with each lateral lobe divided into a terete, upcurved lateral process and a broader, flatter mesal plate; both with several sensillae. Cercus large, broadly oval in outline. Clasper elongate, almost rectangular in lateral aspect, with a small sharp basomesal spine; apicomesal angle slightly produced ventrally. Phallus tubular, inflated basally, with a complex internal sclerite developed basically from a dissected cylindrical form.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada la Iguaná, 17 km NW of Medellín [road to San Jerónimo], 14–15 Feb 1983, O.S. Flint, Jr. USNM Type.

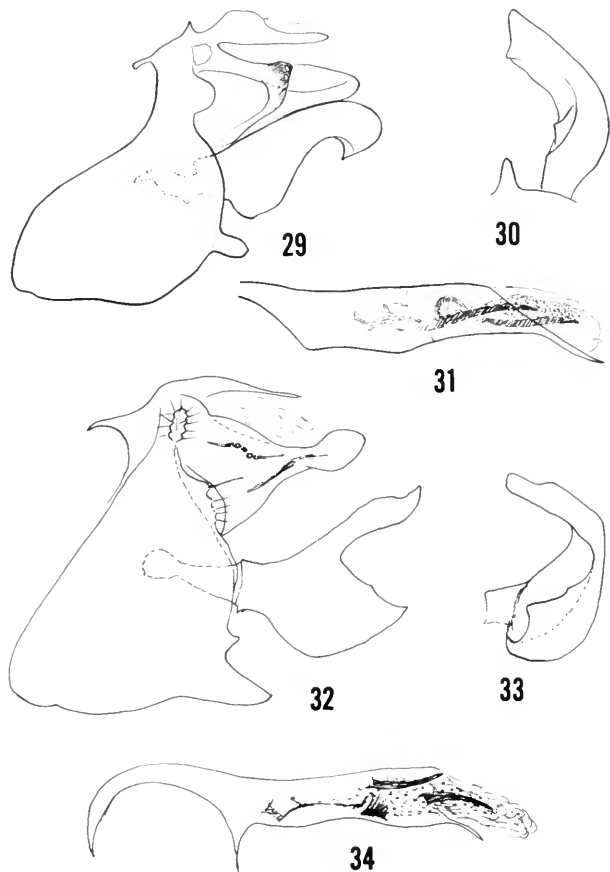
Paratypes: Same data as holotype, but 22 Feb 1984, C.M. & O.S. Flint, Jr., 25♂, 2♀.

Chimarra (Chimarra) duckworthi Flint

FIGURES 29–31

Chimarra duckworthi Flint, 1967b:5–6.

The species was originally described from Costa Rica and Panama. There are examples in the NMNH from Veracruz in



FIGURES 29–34.—*Chimarra (Chimarra) duckworthi* Flint: 29, male genitalia, lateral; 30, clasper, posterior; 31, phallus, lateral. *C. (C.) platyrhina* Flint: 32, male genitalia, lateral; 33, clasper, posterior; 34, phallus, lateral.

Mexico, Honduras, Venezuela, and Ecuador. The following is a first record for Colombia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada la Jiménez, Sopetrán (trap C), 11–27 May 1983, U. Matthias, 1♂.

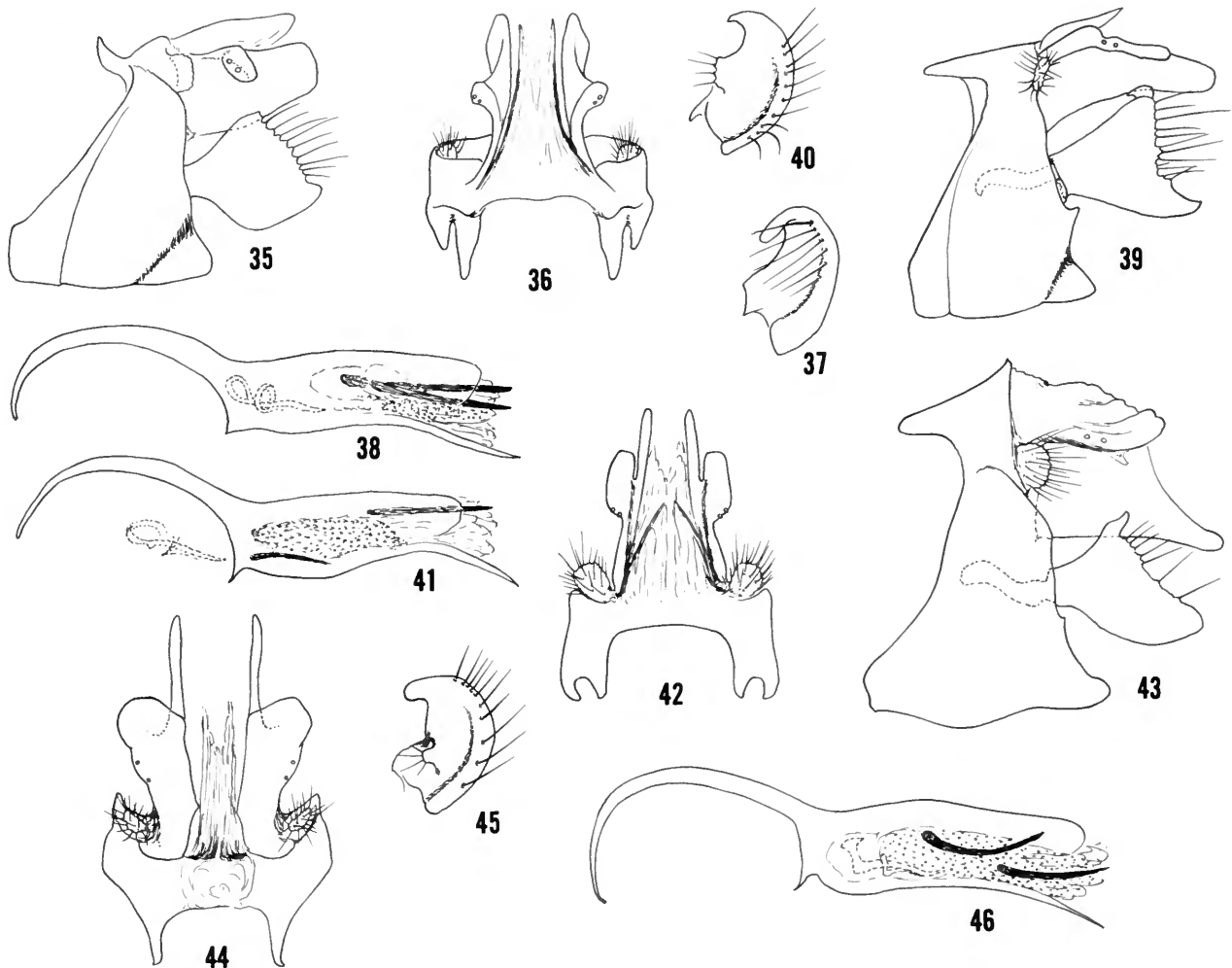
Chimarra (Chimarra) platyrhina Flint

FIGURES 32–34

Chimarra (Chimarra) platyrhina Flint, 1981a:13–14.

This species was recently described from northern Venezuela and is here recorded from Colombia. It seems, together with *C. (C.) emima* Ross and *C. (C.) duckworthi* Flint, to inhabit the drier, or at least more strongly seasonal wet-dry, areas of Antioquia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 26♂; same, but 3–4 Mar 1984, C.M. & O.S. Flint, Jr., 2♂. “Finca Velásquez,” Sopetrán, 14 Feb 1983, O.S.



FIGURES 35-46.—*Chimarra (Chimarra) emima* Ross: 35, male genitalia, lateral; 36, ninth and tenth terga, dorsal; 37, clasper, posterior; 38, phallus, lateral. *C. (C.) onima*, new species: 39, male genitalia, lateral; 40, clasper, posterior; 41, phallus, lateral; 42, ninth and tenth terga, dorsal. *C. (C.) decimlobata*, new species: 43, male genitalia, lateral; 44, ninth and tenth terga, dorsal; 45, clasper, posterior; 46, phallus, lateral.

Flint, Jr., 1♂. Quebrada la Jiménez, Sopetrán (trap C), 2 Jun-19 Nov 1983, U. Matthias, 3♂. DPTO. MAGDALENA: stream near Minca, Sierra Nevada de Sta. Marta, ~2000 m, 13 Jul 1983, U. Matthias, 1♂.

Chimarra (Chimarra) emima Ross

FIGURES 35-38

Chimarra emima Ross, 1959:172.

This species was originally described from Panama, and I have seen examples from Nicaragua, Costa Rica, and Ecuador. This is the first record of the species from Colombia where it is recorded from 3 departments.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada

Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 2♂. Río Aurrá (at km 50), San Jerónimo, 14 Feb. 1983, O.S. Flint, Jr., 1♂, 8♀. "Finca Velásquez," Sopetrán, 14 Feb 1983, O.S. Flint, Jr., 1♀. Quebrada la Jiménez, Sopetrán (trap C), 22 Jun-4 Jul 1983, U. Matthias, 1♂, 1♀; 24 Jan 1984, 1♀. DPTO. RISARALDA: 4 km E Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. DPTO. TOLIMA: Armero near Guayabal, 2-10 Feb 1977, E.L. Peyton, 1♂.

Chimarra (Chimarra) onima, new species

FIGURES 39-42

This species and *C. (C.) emima* Ross are very closely related,

only to be distinguished by differences in the tenth tergum and claspers in the male genitalia. In *C. (C.) onima*, the dorsal margin of the tenth tergum is produced into a flat, free lobe extending posteriad, and the posteroventral angle of the clasper is slightly more produced.

ADULT.—Length of forewing, 4.5–5 mm. Color fuscous, femora of legs slightly more tawny. Forewing with a well-developed bulla in radial system; hindwing with 3 branches to Rs and 3 to M. *Male genitalia*: No tergal lobes. Ninth segment moderately produced anteroventrally. Tenth tergum with dorsal margin strongly sclerotized with 2 sensillae on each side; dorsal margin produced at midlength into a rounded lobe free of and parallel to the apical section as seen in dorsal aspect; apical section elongate, narrowed apicad, lightly sclerotized. Cercus a small, ovoid lobe. Clasper with posterior margin nearly straight; posterodorsal angle produced into a mesal hook, posteroventral angle slightly produced, margin with a row of enlarged setae. Phallus tubular, apicoventral angle produced into a spine; base inflated; internally with 2 unequal spines, a slender basal rod and ring assembly, and a spiculate pouch.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 14 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 9♂, 5♀; same, but 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♀. 18 km E of San Jerónimo, 23 Feb 1984, C.M. & O.S. Flint, Jr., 1♂, 1♀. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 25♂.

Chimarra (Chimarra) decimlobata, new species

FIGURES 43–46

This striking species appears to be another species related to *C. (C.) emima* Ross, based on the general structure of the male genitalia. However, it is highly specialized as shown by the exceptional development of the dorsal margin of the tenth tergite into a very large, flat lobe, and the extension of the apicoventral angle of the clasper.

ADULT.—Length of forewing, 5–6.5 mm. Color fuscous, femora slightly paler. Forewing with a bulla in radial system; hindwing with 3 branches to Rs and 3 to M. *Male genitalia*: No tergal lobes. Ninth segment moderately produced anteroventrally. Tenth tergum with dorsal margin strongly sclerotized, rugose, in dorsal aspect flat and broad with apex rounded; apical section lightly sclerotized, with ventral margin narrowly produced posteriad. Cercus a small, ovate lobe. Clasper with posterior margin oblique and bearing a row of enlarged setae, apicoventral angle produced; with a small setose lobe on inner face in posterior aspect. Phallus tubular, inflated basally, apicoventral lip produced into a spine, with 2 subequal spines, a basal rod and ring assembly, and a spiculate pouch.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Sta.

Elena], 24 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 9♂, 4♀; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 6♂, 3♀. 10 km E Medellín [road to Las Palmas], 21 Feb 1984, C.M. & O.S. Flint, Jr., 2♀. Quebrada La Ayurá, Envigado (trap B), Apr 1983–Mar 1984, U. Matthias, 42♂, 63♀. DPTO. RISARALDA: 4 km E Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 3♂.

Chimarra species

I have females of another three species that are distinctly different from those of all the previously treated species. I mention each here as an indication of the further diversity to be expected.

Chimarra species A

Species A is a member of the subgenus *Curgia*. Its forewings are brown with numerous yellow spots.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 22 Feb 1983, O.S. Flint, Jr., 1♀.

Chimarra species B

Species B is a very distinctive member of the subgenus *Chimarra*. It has the bulla in the radial system of the forewing, and 4 branches to Rs in the hindwing but only 2 branches to M, and the genitalia are very long and compressed.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 27 km W Medellín [road to San Jerónimo], 23 Feb 1984, C.M. & O.S. Flint, Jr., 1♀.

Chimarra species C

Species C is a typical member of the subgenus *Chimarra* with internal sclerites of the genitalia distinctly different from all others in the subgenus here treated.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), Sep 1983, U. Matthias, 1♀.

Genus *Wormaldia* McLachlan

This genus is very widespread, being well represented on most continents: Europe, Africa, Asia, and all the Americas. The species are generally encountered in hilly or mountainous areas, and are known from Canada south through Central America to southern Peru and across northern South America to Trinidad, Tobago, and Grenada. Three species are here recorded from Antioquia, and undoubtedly more will be found.

The immature stages of North American and European species are well described (Ross, 1944; Wiggins, 1977). They are inhabitants of slender, finger-shaped, silken tubes attached in crevices underneath sticks or stones in rapidly flowing water. They are generally found in springs and cool, small, spring-fed streams.

Key to Antioquian Species of *Wormaldia*

1. Clasper with apical segment almost twice as long as basal *W. prolixa*, new species
 Clasper with basal and apical segments of approximately equal length 2
2. Eighth tergum with a large, dark apicomeral pouch *W. palma*, new species
 Eighth tergum with a pair of short lobes from posterior margin
 *W. planae* Ross and King

Wormaldia planae Ross and King

FIGURES 47, 48

Wormaldia planae Ross and King, in Ross, 1956a:64.—Flint, 1968b:9; 1971b:20; 1981a:10.

This is a widespread species known from Mexico, Guatemala, Panama, Colombia, Venezuela, Brazil, Ecuador, Trinidad, Tobago, and Grenada. Records are here given from four Departments in Colombia, indicating a widespread distribution through the country.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 4♂; same, but 3–4 Mar 1984, C.M. & O.S. Flint, Jr., 2♂. Quebrada la Jiménez, Sopetrán (trap C), 2 Jun–3 Aug 1983, U. Matthias, 2♂. DPTO. META: Quebrada Blanca, 3 km W Restrepo, 11 Feb 1983, O.S. Flint, Jr., 2♂. DPTO. RISARALDA: Termales de Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. 4 km E Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. DPTO. VALLE DEL CAUCA: Tablona, Finca "La Florida" [NE Palmira], 1300 m, 7 Jan 1959, J.F.G. Clarke, 16♂, 4♀.

Wormaldia palma, new species

FIGURES 49, 50

The species is a member of the *arizonensis* group, probably closest to *W. planae* Ross and King. From the latter it is to be distinguished by slight differences in the tenth tergum, proportionately shorter cerci, and especially in the very different structure of the eighth tergum.

ADULT.—Length of forewing, 5.5–6 mm. Color fuscous, legs more brown; forewing fuscous with a few golden-brown spots near midlength. No sternal processes. **Male genitalia:** Eighth tergum with a large, darkened, mesal pouch, in dorsal aspect with posterior margin of pouch slightly produced and very shallowly emarginate. Ninth segment with anterior margin slightly produced at middle. Tenth tergum elongate, apex slightly produced dorsad, at midlength with dorsal margin strongly rounded dorsally and with a sharp lateral spine. Cercus elongate, club-like, distinctly shorter than tenth tergum. Clasper with apical segment slightly shorter than basal, both broadly elongate; apex with a patch of dark spicules on inner face. Phallus tubular, lightly sclerotized, with 2 short, indistinct, internal spines and a ring-like sclerite.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO.

ANTIOQUIA: 10 km E Medellín [road to Las Palmas], 6 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, but 21 Feb 1984, C.M. & O.S. Flint, Jr., 3♂. Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♂, 1♀; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 1♂. 27 km W Medellín [road to San Jerónimo], 23 Feb 1984, C.M. & O.S. Flint, Jr., 1♂.

Wormaldia prolixa, new species

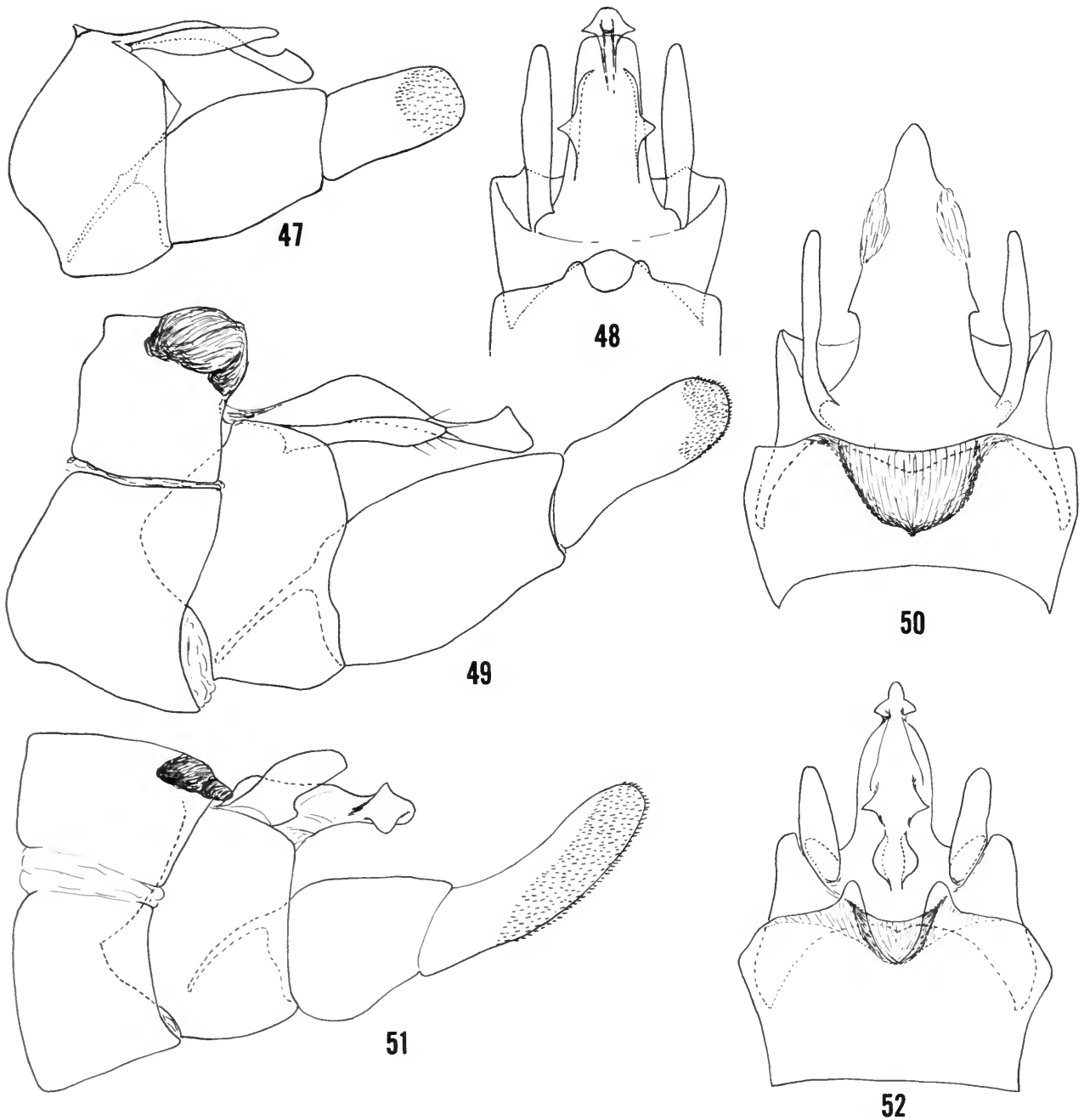
FIGURES 51, 52

The male genitalia, especially the structure of the tenth tergum, indicates that this species is another member of *arizonensis* group, possibly closest to *W. esperonis* Ross and King which likewise has an elongate apical clasper segment. The shape of the process of the eighth tergum, the structure of the tenth tergum, especially the basodorsal lobes, the short cerci, and elongate apical clasper segment, serve to identify *W. prolixa*.

ADULT.—Length of forewing, 4.5–5 mm. Color fuscous, legs and antennae slightly paler; forewing fuscous. No sternal processes. **Male genitalia:** Eighth tergum with posterior margin produced into a pair of rounded, submedian knobs between which is a variably formed, darkened pocket. Ninth segment with anterior margin strongly produced at middle. Tenth tergum elongate, in dorsal aspect with a pair of basal, divergent crests, a lateral spine at midlength, and a subapical trianguloid point; apex with a dorsal point. Cercus rather short, arched dorsad. Clasper with basal segment short and broad, apical segment almost twice as long as basal, slightly curved, with an elongate ventromesal patch of dark spicules. Phallus with a single, large, curved, internal spine.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km E Medellín [road to Sta. Elena], 6 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 2♀. Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♂; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 1♂. 10 km E Medellín [road to Las Palmas], 21 Feb 1984, C.M. & O.S. Flint, Jr., 4♂. Piedras Blancas, 10 km E Medellín [road to Guarne], 2 Mar 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada la Cebolla, W of La Fé, 21 Feb 1984, C.M. & O.S. Flint, Jr., 1♂, 1♀; same, but trap A, 15 Sept 1983, U. Matthias, 1♂; 1 Dec 1983, 1♀; 17 Dec 1983, 1♂; 31 Dec 1983, 1♀.



FIGURES 47-52.—*Wormaldia planae* Ross and King: 47, male genitalia, lateral; 48, eighth, ninth, and tenth terga, dorsal. *W. palma*, new species: 49, male genitalia, lateral; 50, eighth, ninth, and tenth terga, dorsal. *W. proluxa*, new species: 51, male genitalia, lateral; 52, eighth, ninth, and tenth terga, dorsal.

Quebrada La Ayurá, Envigado (trap B), 6–14 Apr 1983, U. Matthias, 1♀; 6 Oct 1983, 1♂, 1♀. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 2♂, 2♀. PANAMA. [Panama], Cerro Campana, 11–14 Jul 1967, O. S. Flint, Jr., 4♂, 10♀. COSTA RICA. PCIA. CARTAGO: Tapantí, 1530 m, 23 Dec 1983, M. Valverde D., 1♂, 1♀ (SDNHM). Reserva Tapantí, unnamed tributaries ~9 km NW tunnel (9.72°N, 83.78°W), 1400 m, 8–9 Jun 1988, C.M. & O.S. Flint, Jr., R.W. Holzenthal, 4♂. PCIA. ALAJUELA: Río San Lorencito and tribs., Reserva Forestal San Ramón (10.216°N, 84.607°W), 980 m, 13–16 Jun 1988, C.M. & O.S. Flint, Jr., R.W. Holzenthal, 2♂, 3♀.

Family XIPHOCENTRONIDAE

Xiphocentron and related genera have recently been revised by Schmid (1982) who recognized them as a distinct family. Because the group is so easily characterized in the adult and larval stages, I follow him in recognizing this family. Most species are found in the American tropics and southern Asia, although a few species are found in central Africa and Japan. Three genera are recognized in the Neotropics, but *Machairocentron* is not yet reported from Colombia although it almost assuredly will be found with more collecting.

Key to Antioquian Genera of Xiphocentronidae

- Male genitalia with basal clasper segment produced as a large lobe extending posteriad beneath apical segment *Cnodocentron*
- Basal clasper segment not produced, dorsal and ventral margins of both segments confluent *Xiphocentron*

Genus *Xiphocentron* Brauer

This, the largest genus of the family, is exclusively New World in distribution. Species are found from the southwestern United States south into west-central Argentina and the West Indies. Schmid (1982) recognized 5 subgenera in the genus based on the male genital structure. Both the species reported from Antioquia belong to the subgenus *Antillotrichia* (*Xirocen-*

tron Schmid is a synonym).

The larvae of a Texan species (Edwards, 1961; Wiggins, 1977) and a Puerto Rican species (Flint, 1964b) have been described. The larvae construct long tubes of silk and debris on solid substrates which may be under water or on moist surfaces near the water. Their food is unknown, but they probably feed on organic matter they can scrape from the substrate.

Key to Antioquian Species of *Xiphocentron*

- Cercus angled beyond base so that apical 3/4 is directed posteriad *X. mnesteus* Schmid
- Cercus straight from base to apex, angled slightly dorsad . . . *X. regulare*, new species

Xiphocentron (Antillotrichia) mnesteus Schmid

FIGURE 53

Xiphocentron (Xirocentron) mnesteus Schmid, 1982:69–70.

This species, recently described from Venezuela, is quite common and often abundant in Antioquia. The adults are usually taken by net in the daytime from the foliage of plants beside small, tumbling brooks.

The coloration of the forewing is quite variable. About half of the examples studied lack any white mark, while in the remainder a mark is present that varies from a very small fleck to a complete crossband.

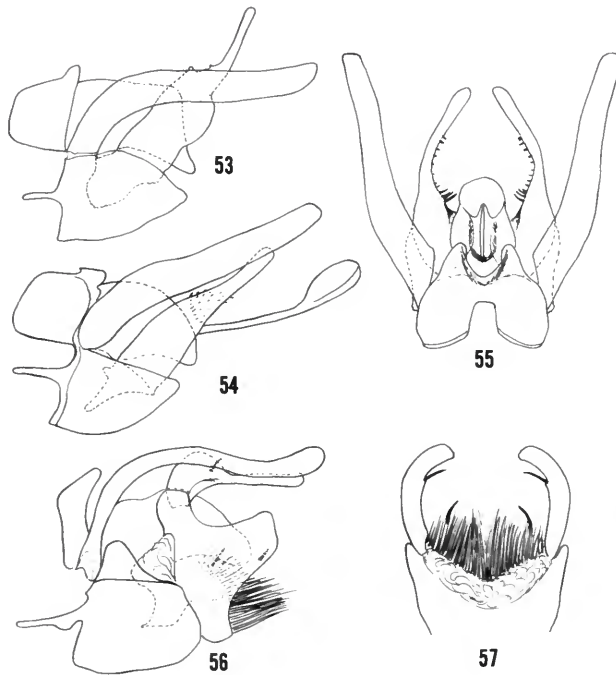
MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Agudelo, 2 km E El Retiro, 8 Feb 1983, O.S. Flint, Jr., 18♂, 3♀; same, but 25 Feb 1984, C.M. & O.S. Flint, Jr., 24♂, 2♀. Boquerón, source of Quebrada Potreros, W of La Fé, 26 Feb

1984, C.M. & O.S. Flint, Jr., 2♂, 1♀. Quebrada la Cebolla, W of La Fé, 21 Feb 1984, C.M. & O.S. Flint, Jr., 1♂; same, but trap A, May 1983, U. Matthias, 1♀. Quebrada Ayurá, above Envigado, 21 Feb 1984, C.M. & O.S. Flint, Jr., 1♂; same, but trap B, April 1983, U. Matthias, 1♀; Jan 1984, 1♂. Quebrada Espadera, 7 km E Medellín [on road to Santa Elena], 24 Feb 1983, O.S. Flint, Jr., 2♂, 1♀; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada La García, 20 km NW of Medellín [road to San Pedro], 13 Feb 1983, O.S. Flint, Jr., 1♀. DPTO. RISARALDA: Termas de Santa Rosa de Cabal, 28 Feb 1984, C.M. & O.S. Flint, Jr., 5♂, 4♀.

Xiphocentron (Antillotrichia) regulare, new species

FIGURES 54, 55

The species seems to be most closely related to *X.*



FIGURES 53-57.—*Xiphocentron (Antillotrichia) mnesteus* Schmid: 53, male genitalia, lateral. *X. (A.) regulare*, new species: 54, male genitalia, lateral; 55, same, dorsal. *Cnodocentron (Caenocentron) immaculatum*, new species: 56, male genitalia, lateral; 57, same, dorsal.

surinamense Flint. It is most easily distinguished from that species and its other relatives by the nearly straight aspect of the cerci and claspers in lateral view. Most species have the cerci sharply angled near the base and the apex of the claspers angled dorsad.

ADULT.—Length of forewing, 5 mm. Color fuscous; forewing fuscous with a silvery-white spot at $\frac{2}{3}$ of its length. Hindleg with apical spine slender, about half length of basal tarsomere. Fifth sternum with anterolateral region with cuticle modified, reticulate. **Male genitalia:** Ninth sternum with narrow anterolateral processes, posterior margin slightly bilobate in ventral aspect; tergum rounded anteriorly, with a pair of submesal lobes posteriorly. Tenth tergum short, tip not notably decurved, sclerotized laterally. Cercus long, in lateral aspect straight from base to apex. Clasper enlarged basally, apical section slender, nearly straight in lateral aspect, mesal face with a series of irregular dark points. Phallus very long and slender, apex slightly enlarged and divided ventrally; base flared, bell-like.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km N Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Genus *Cnodocentron* Schmid

The typical subgenus is restricted to the southern Himalayas, while the subgenus *Caenocentron* is limited to the New World from Mexico to Colombia. The present species brings to six the number of species known in the Neotropics.

No larvae are known in this genus.

***Cnodocentron (Caenocentron) immaculatum*, new species**

FIGURES 56, 57

This species is close to *C. galesus* Schmid but differs in numerous characteristics of the male genitalia. The apical segment of the clasper is broader and more strongly arched, and the lobe of the ventral segment bears a strong tooth near the ventral margin in *C. (C.) immaculatum*.

ADULT.—Length of forewing, 3 mm. Color in alcohol, uniformly dark brown; forewing lacking any indication of white marks. Hindleg with apical spur slender, about half length of basal tarsomere. Fifth sternum with anterolateral region with cuticle modified and reticulate. **Male genitalia:** Ninth sternum with narrow anterolateral process, posterior margin not produced; tergum narrow, unmodified dorsally. Tenth tergum short, tip only slightly decurved, sclerotized laterally. Cercus long, slender, evenly sinuate in lateral aspect. Clasper 2-segmented; basal segment with a large posteroventral brush of long hair, and a single long, dark spine from mesal face of clasper near top of brush, lateral lobe long, broad, with apex truncate and mesal face bearing a strong, black spine near ventral margin; apical segment curved and produced dorsad near base, mesal face here bearing a short, black spine, apex slender. Phallus very long and slender, apex slightly enlarged and divided ventrally; base flared, bell-like.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), 7 Feb 1984, U. Matthias. USNM Type.

Paratype: Same data as holotype, but 2 Sep 1983, 1♀.

Family PSYCHOMYIIDAE

This family is widely distributed over all of the regions of the world. Many authors (e.g., Wiggins, 1977) divide it into two families, the Polycentropodidae and Psychomyiidae. However, I prefer to consider them as subfamilies until the status of certain of the anomalous genera such as *Paduniella* and *Pseudoneureclipsis* are fully clarified. The two genera here treated belong to the Polycentropodinae as strictly defined. Several other Polycentropodine genera must occur in the Department, but have not been taken yet: *Cernotina*, *Cyrnellus*, and *Nyctiophylax*.

Key to Antioquian Genera of Psychomyiidae

- Hindwing with R₂ present *Polycentropus*
- Hindwing lacking R₂ *Polyplectropus*

Genus *Polycentropus* Curtis

This genus as presently recognized is found in all regions of the world. Although most diverse in the Northern Hemisphere, it is well represented in the montane and temperate parts of the neotropics. Species are found from Mexico to southern Patagonia and the larger islands of the West Indies. Only two species have been taken in Antioquia, but more will probably

be found with further collecting.

The immature stages have been described for a number of species (Flint, 1968b; Wiggins, 1977; Correa et al., 1981). The larvae construct silken retreats and trap nets of various forms. Although they feed on a wide variety of plant and animal matter entrapped in these nets, many species seem to be primarily predators.

Key to Antioquian Species of *Polycentropus*

- Cercus with a dorsomesal, spinelike process upturned at the tip *P. ceciliae*, new species

 Cercus without a spinelike process in this area, but with a strong ventral spine directed mesally *P. unispina*, new species

Polycentropus unispina, new species

FIGURES 58-61

This species is a member of the *gertschi* group, quite close to *P. connatus* Flint. From the latter species it is easily distinguished by the shape of the cercal lobes, especially the presence of the mesally directed and pointed ventral lobe, and the presence of only 1 sharp spine from the mesal shelf of the clasper.

ADULT.—Length of forewing, 7-9 mm. Color brown, venter of body and legs stramineous; forewing brown with many scattered, small, golden spots. *Male genitalia*: Ninth sternum large, only slightly higher than long. Tenth tergum membranous. Cercus with all lobes united; dorsomesal process long, angled ventrad, apex pointed and angled laterad, with a small, broad lobe united to base of process; with a small rounded lateral lobe; ventral process angled mesad beneath phallus, ending in a sharp spine directed posteriad. Clasper with a large, thin, rounded lateral lobe; mesal ridge bearing a single large erect tooth basad, and ending in an apical point. Phallus with a long, pointed apicoventral lip, dorsal surface sclerotized, inrolled at apex; internally with a tubular, basal sclerite and a long, thin, sinuous sclerite ending in a ventral spine-like process.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Santa Elena], 24 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 3♀; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada la Ayurá, Envigado (trap B), April-July 1983, U. Matthias, 4♂, 2♀.

Polycentropus ceciliae, new species

FIGURES 62-65

Another species of the *gertschi* group, *P. ceciliae* is close to *P. azulus* Flint, *P. dentoides* Yamamoto, and *P. mayanus* Flint. From all of these it differs in having the ventral lobe of the cercus drawn out into a long, pointed process and in having the dorsal process upturned apicad.

ADULT.—Length of forewing, 6 mm. Color brown, venter of body and legs stramineous; forewing brown with many small, scattered golden flecks. *Male genitalia*: Ninth segment produced dorsad, ventral portion almost circular in outline. Tenth tergum membranous. Cercus with dorsal process rodlike, upturned from midlength; with a rounded dorsolateral lobe; ventral lobe produced into an elongate lobe tapering to an apical point angled ventromesad. Clasper with a high, thin, rounded lateral lobe, mesal ridge well developed, bearing from dorsal surface many stout, spinelike setae and ending in a small apical hook. Phallus with a long, pointed, apicoventral lip; internally with a tubular dorsal sclerite and a single, long spine.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW of Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Genus *Polyplectropus* Ulmer

Although species have been placed in *Polyplectropus* from many regions of the Old World, the genus is best developed and most homogeneous in the New World tropics. Species have been found from the southern United States south to Argentina, and a single species is known from the Lesser Antilles. Species tend to inhabit larger flowing waters and are thus more diverse in lowland areas than in highland.

Larvae were first described by Flint (1964a) and redescribed by Wiggins (1977). They live under silken covers in small depressions on large rocks in flowing water. The larval food is not recorded.

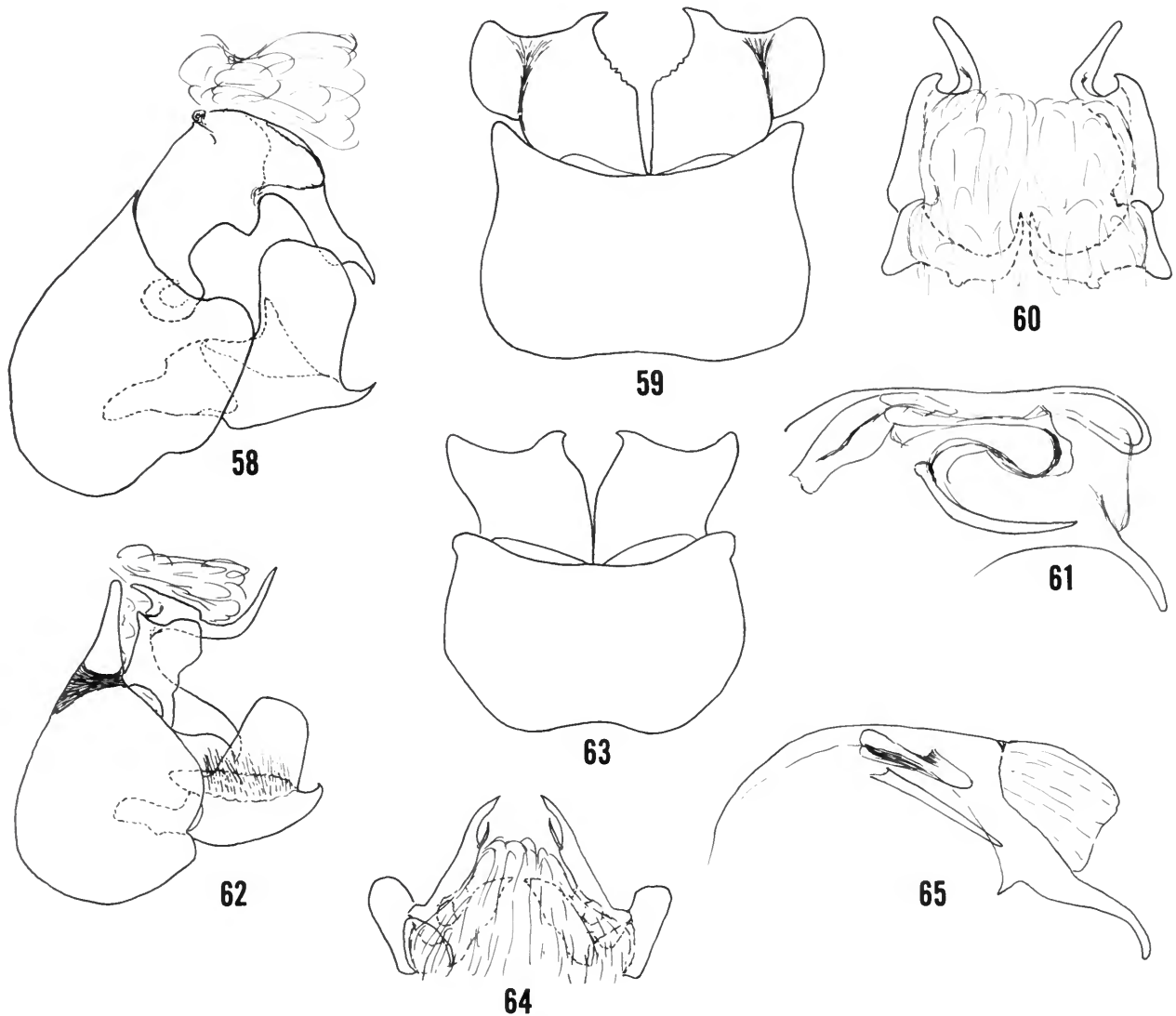
Polyplectropus laminatus (Yamamoto)

FIGURES 66-68

Polycentropus laminatus Yamamoto, 1966:909.—Denning, 1971:208.—Macs and Flint, 1988:3.

Polyplectropus laminatus (Yamamoto).—Flint, 1968b:21.

The species was described from Ecuador, and later recorded



FIGURES 58-65.—*Polycentropus unispina*, new species: 58, male genitalia, lateral; 59, ninth segment and claspers, ventral; 60, tenth tergum and cerci, dorsal; 61, phallus, lateral. *P. ceciliae*, new species: 62, male genitalia, lateral; 63, ninth segment and claspers, ventral; 64, tenth tergum and cerci, dorsal; 65, phallus, lateral.

from Nicaragua, although it was noted that the latter material differed somewhat from the type. I have seen a number of collections from Ecuador, Venezuela, and Costa Rica that apparently represent several undescribed species very closely related to *P. laminatus*. Thus, I regard the Nicaraguan material as quite likely erroneously identified. The example here recorded agrees very closely with the figures of the type, and I have no doubts as to its identity.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Río Claro [near Río Magdalena on Medellín-Bogotá highway], 3 May 1984, U. Matthias, 1♂. DPTO. VALLE DEL CAUCA: Río Raposo, Jan 1965, V.H. Lee, 12♂, 8♀.

Family ECNOMIDAE

This is a family of few genera, although quite speciose, found in the warmer areas of Europe, Africa, Asia, and the Neotropics, but with a genus in the cooler regions each of Australia and South America. Only a single widespread genus is known in the New World.

Genus *Austrotinodes* Schmid

This genus is Neotropical in distribution, with records from the southwestern United States to southern Patagonia, and the Greater Antilles (Flint and Denning, 1989b). The genus is

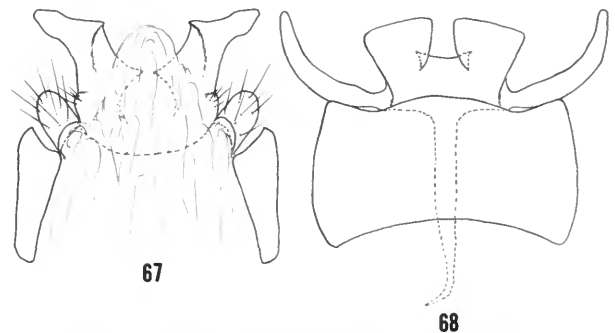
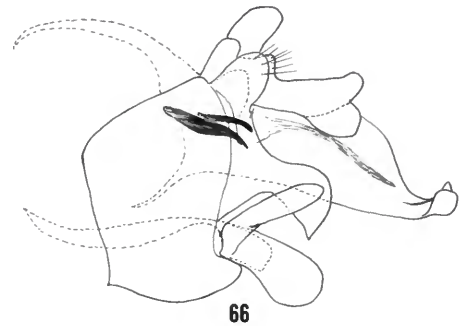
divisible into two sections, one restricted to the Chilean Subregion, the other to the Brazilian. A single female, assignable to an unknown species of the second section was taken in Antioquia.

The larva of a Chilean species was described by Flint (1973). Nothing is known of the larval food habits.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 24 km NW of Medellín [road to San Jerónimo], 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♀.

Family HYDROPTILIDAE

This is the family of the micro-caddisflies. It is very large and diverse, both in terms of genera and species, and is found in all regions of the world. Although the family was recently studied very carefully (Marshall, 1979), the suprageneric classification, especially, is still quite unsatisfactory. All of the Neotropical genera are placed in the Hydroptilinae, the other subfamily (Ptilocolepinae) being exclusively limited to the northern hemisphere. The genera *Anchitrichia*, *Leucotrichia*, and *Alisotrichia* are placed in the tribe Leucotrichiini, although the last genus is rather anomalous therein and may be placed better in the Stactobiini. *Hydroptila* and *Oxyethira* are placed in the Hydroptilini, *Neotrichia* in the Neotrichiini, and *Ochrotrichia* and *Rhyacopsyche* in the Ochrotrichiini. It is quite certain that a number of other genera will be found in the region when it is more fully collected.



FIGURES 66-68.—*Polypectropus laminatus* (Yamamoto): 66, male genitalia, lateral; 67, tenth tergum and cerci, dorsal; 68, ninth segment and claspers, ventral.

Key to Antioquian Genera of Hydroptilidae

1. Ocelli absent *Hydroptila*
 With 2 or 3 ocelli 2
2. Hindtibia with a single preapical spur *Neotrichia*
 Hindtibia with 2 preapical spurs 3
3. Foretibia with a small, but distinct, apical spur 4
 Foretibia lacking all spurs 8
4. Phallus consisting of a basoventral tube, a midlength complex usually with a basodorsal loop and lateral "window," and an apical tube often with internal spines 5
 Phallus variously formed, but never with a midlength complex, often with 2 large, external spines towards the apex or with an internal complex at midlength . . . 6
5. Eighth sternum of male bearing a long, branching, lateral process *Anchitrichia*
 Eighth sternum without a lateral process *Leucotrichia*
6. Clasper large, broad, and at least half length of ninth segment in lateral aspect; phallus large, with 2 black spines extending freely from apical portion *Ochrotrichia* (*Metrichia*)
 Clasper either small and inconspicuous or large; phallus rarely with 1 small, black spine, usually lacking free spines 7
7. Clasper large, extending at least as far posteriad as ninth or tenth terga; phallus large, with various apical tubes or processes *Rhyacopsyche*
 Clasper small, much surpassed by subgenital plate and tenth tergum; phallus

- relatively short, with a broader apical half bearing an internal, basal complex *Alisotrichia*
8. Midtibia without a preapical spur: spur count 0,2,4 *Alisotrichia*
Midtibia with a preapical spur: count 0,3,4 9
9. Mesoscutellum with a linelike, arcuate fracture running from one lateral angle to the other *Ochrotrichia (Ochrotrichia)*
Mesoscutellum without such a fracture *Oxyethira*

Genus *Anchitrichia* Flint

This is the third species placed in the genus which is known from central Mexico south to Paraguay. The genus is quite easily recognized, being rather large for hydroptilids and colored fuscous with longitudinal streaks of green hair on the thorax and forewings.

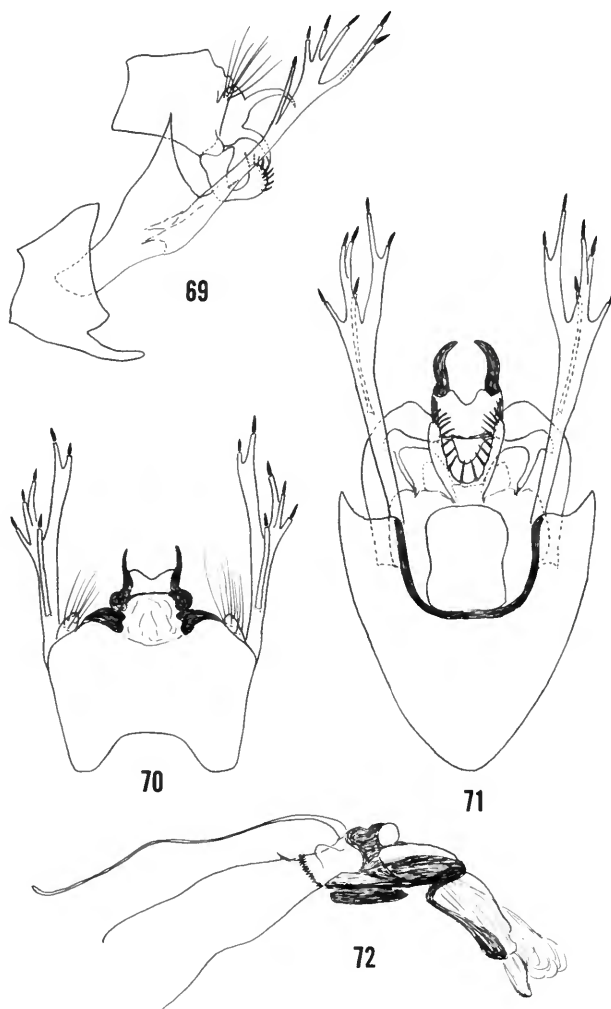
The larvae of the type species, *A. spangleri* Flint, was described by Flint (1970) based on supposition. Recent collections of these same larvae and metamorphotypes have confirmed this association. They live on large rocks in stony rapids in large streams. The pupa is enclosed in a silken, torpedo-shaped cocoon which floats freely in the water and is attached to the rock by a slender thread. The larva apparently grazes on the periphyton on the rock in the vicinity of the larval case which is immovably fixed to the substrate.

Anchitrichia palmatiloba, new species

FIGURES 69-72

This species is most closely related to *A. duplifurcata* Flint which is known from Brazil and Paraguay. In the latter species there is a slender process from the mesal margin of the eighth sternum, the long, lateral processes are deeply divided, each branch being bilobed at its apex, and the subgenital plate is troughlike with a ventral beak. In *A. palmatiloba* there is no mesal process from the eighth sternum, the lateral processes are divided near their apices in a half dozen shorter lobes, and the subgenital plate bears a dorsolateral process.

ADULT.—Length of forewing, 4-5 mm. Color fuscous with lineate green stripes; head with green hairs, fuscous dorsally, mesothorax dorsally fuscous with dorsolateral and mesal green stripes; antennae green, annulate; legs mostly fuscous with green fringes, tarsi annulate; forewing fuscous with longitudinal green stripes, fringe mostly fuscous. *Male genitalia*: Seventh sternum with a projecting mesal process. Eighth sternum with a long posterolateral process whose apex is divided into 6 shorter processes each tipped by a short dark seta; posteromesal margin deeply emarginate, within emargination is a large rectanguloid plate. Ninth tergum almost quadrate in lateral aspect with a short posterolateral lobe bearing many setae, and a dorsomesal area with setae. Subgenital plate with ventral surface only slightly produced, apex slightly bilobed in ventral aspect, dorsolaterally with a semi-erect, pointed process. Clasper curved in lateral aspect, almost C-shaped, with



FIGURES 69-72.—*Anchitrichia palmatiloba*, new species: 69, male genitalia, lateral; 70, same, dorsal; 71, same, ventral; 72, phallus, lateral.

a row of short dark spines on its ventromesal margin. Phallus with usual basal tube, loop, and midlength complex; apical section troughlike, more strongly sclerotized laterally and ventrally, membranous mesally.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Río Aurrá, km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 1♀. ECUADOR. PCIA. COTOPAXI: 36 km NE Quevedo, 1100 ft (~330 m), 21 July 1976, J. Cohen, 1♂. PCIA. PASTAZA: Estación Fluviométrica, 27 km N Puyo, 4 Feb 1976, Spangler et al., 3♀. 5 km S Puyo, 14 May 1977, Spangler and Givens, 2♀. VENEZUELA. EDO. ZULIA: Misión El Tucuco, Río El Tucuco, 1/2 km from Perijo El Tucuco, 1-5 Oct 1979, H.M. Savage, 1♂, 3♀.

Genus *Leucotrichia* Mosely

The region has proven to have an unexpected diversity of species, all of the new species were active in the day and were

taken by net. They belong to the *melleopicta* group, only *L. fairchildi* Flint being in the *pictipes* group, and bring to 16 the number of described species in the genus. Species of the genus are known from the northern United States south to Colombia and Venezuela as well as the West Indies.

The larvae, which live in flowing water, have been described several times (Flint, 1970; Wiggins, 1977). The first 4 instars are free living and quickly completed. At the fifth instar the larva constructs a silken shelter within which it lives and increases greatly in size, feeding by extending its foreparts from openings in either end of the case. They feed on the periphyton and debris on the rock around the shelter.

Key to Antioquian Species of *Leucotrichia*

1. Ocelli 2; basal antennal segments flat and broad *L. fairchildi* Flint
 Ocelli 3; head and antennae unmodified 2
2. Eighth sternum in lateral aspect barely longer than wide; clasper broadly rounded apically *L. brochophora*, new species
 Eighth sternum at least 1 1/2 times as long as wide; clasper either pointed apicad or rounded, if rounded then sternum twice as long as wide 3
3. Clasper ending in a sharply upturned point 4
 Clasper rounded apically, or if pointed, not upturned 5
4. Eighth sternum in lateral aspect with posterior margin broadly rounded
 *L. inops*, new species
 Eighth sternum with posterior margin produced into an angulate lobe
 *L. padera*, new species
5. Eighth sternum in ventral aspect with posterolateral angles produced into lobes as long as wide *L. ayura*, new species
 Eighth sternum with posterior margin slightly concave, posterolateral angles barely produced 6
6. Clasper ending in a sharp point *L. interrupta*, new species
 Apex of clasper bluntly rounded *L. mutica*, new species

***Leucotrichia fairchildi* Flint**

FIGURES 73-75

Leucotrichia fairchildi Flint, 1970:10-11; 1981a:25.

The species is known from northern Panama and northern Venezuela, and now from northern Colombia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), May-Sep 1983, U. Matthias, 15♂, 25♀. DPTO. TOLIMA: Armero, near Guayabal, 2-10 Feb 1977, E.L. Peyton, malaise trap, 3♂, 2♀.

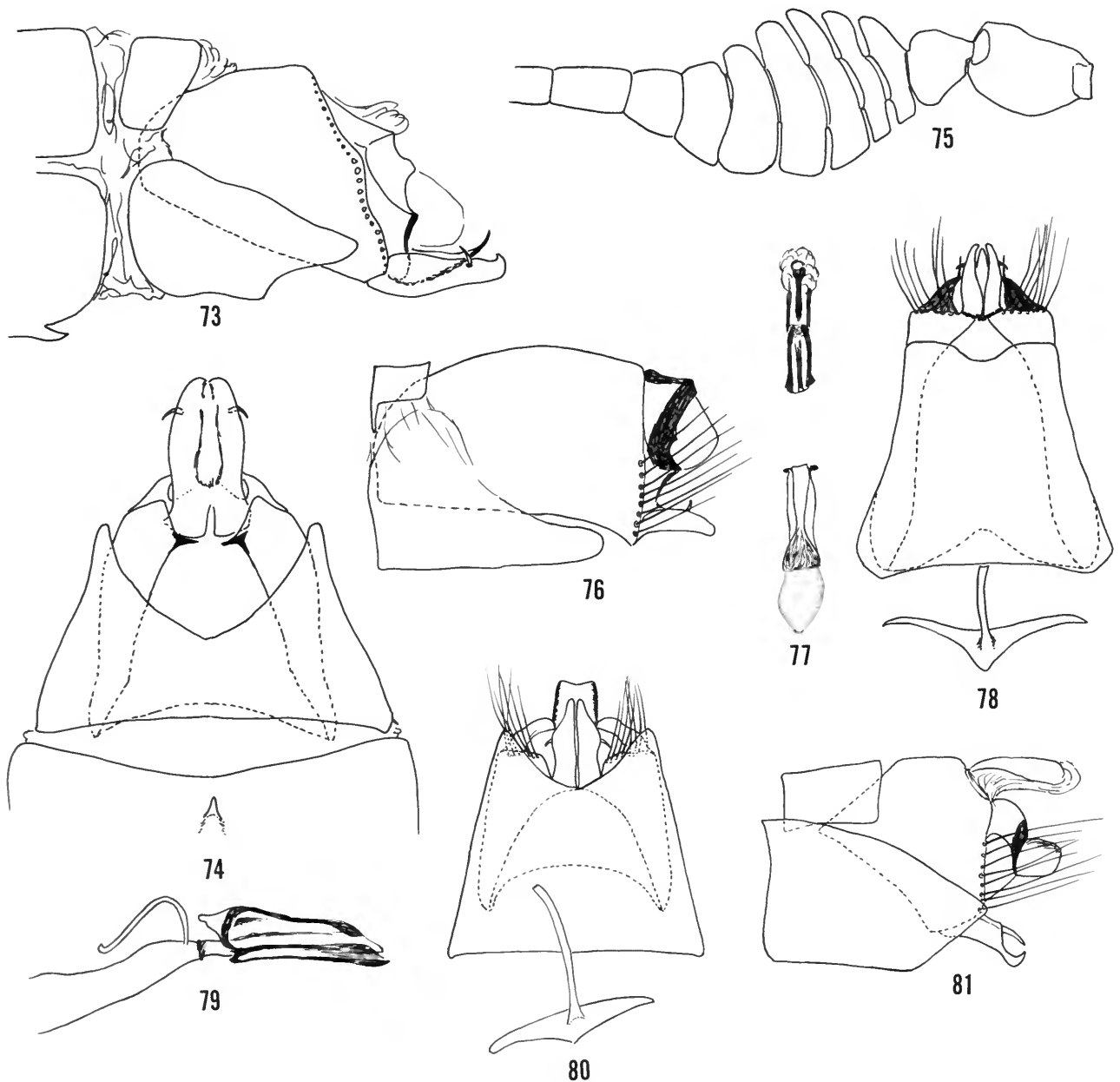
***Leucotrichia mutica*, new species**

FIGURES 76-78

This species appears to be related to *L. limpia* Ross, based on the basal loop of the phallus being borne from a long stem in both species. The ventral aspect of the eighth sternum offers the clearest distinction between the species: in *L. mutica* this is

only shallowly emarginate, but in *L. limpia* it is deeply divided. There are also lesser differences in the shape of the claspers and apparently in the phallus. Unfortunately, the phallus of *L. mutica* was badly damaged during preparation, with the central complex and parts of the apical portion lost.

ADULT.—Length of forewing, 3 mm. Color fuscous, marked with yellowish-green; front of head, tegulae and mesonotum yellowish-green; antennae with 2 segments at 2/3 length and apical segment yellowish-green; forewing with basal 2/3 yellowish-green. Head with 3 ocelli, unmodified (as in *melleopicta*). *Male genitalia:* Seventh sternum with a long, slender, posteromesal process. Eighth sternum tapering rapidly posteriad, posterior margin in ventral aspect with a small mesal excision. Ninth segment very long, with anterolateral margin broadly rounded, in dorsal aspect with anterior margin only slightly emarginate mesally; posterolateral margin with a row of long setae. Tenth tergites well developed, strongly sclerotized; lateral penis sheath short, indistinct. Subgenital plate



FIGURES 73-81.—*Leucotrichia fairchildi* Flint: 73, male genitalia, lateral; 74, same, ventral; 75, antenna, lateral. *L. mutica*, new species: 76, male genitalia, lateral; 77, phallus (lacking central portion), dorsal; 78, genitalia, including seventh sternal process, ventral. *L. padera*, new species: 79, phallus, lateral; 80, genitalia, including seventh sternal process, ventral; 81, male genitalia, lateral.

small, lying totally between claspers. Clasper elongate, rounded apically, with a dorsolateral seta at midlength. Phallus with basal tube; basal loop borne from a long stemlike region ending in an expanded, lightly-sclerotized sac; midlength complex lost; apex with a mesal sclerite, upcurved in lateral

aspect, flanked by lateral sclerites (initial impression was of a structure like that in *L. limpia* (Flint, 1970, figs. 17, 18)).

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Leucotrichia padera, new species

FIGURES 79-81

This species is a member of the *melleopicta* group, but it stands alone within the group based on the structure of the phallus. No other described species has such ribbon-like sclerotized bands apically in the phallus, although *L. ayura*, new species and *L. inops*, new species do possess elongate internal sclerites that appear somewhat similar. In addition, the dorsal, hoodlike sclerite over the tenth tergites, and hooked apices of the claspers, are distinctive.

ADULT.—Length of forewing, 3 mm. Color fuscous, marked with grayish-green; front of head and mesonotum grayish-green, antennae annulate; forewing fuscous, basal $\frac{3}{4}$ grayish-green with a transverse fuscous band at midlength, anterior and posterior margin of basal green section narrowly fuscous. Head with 3 ocelli, unmodified (as in *melleopicta*). *Male genitalia*: Seventh sternum with a long, slender, posteromesal process. Eighth sternum relatively short, with posterior margin produced laterally, deeply concave in ventral aspect. Ninth segment with anterolateral angle slightly less than 90°; posterolateral margin with a row of long setae; anterodorsal margin concave. With a dorsal hoodlike sclerite over tenth tergites which are large, with posterior margins strongly sclerotized; lateral penis sheath short, rounded. Subgenital plate with ventral arm narrow, pointed apically. Clasper elongate, with tip sharply hooked dorsad, with a dorsolateral seta at midlength. Phallus tubular, with a midlength complex bearing a basal loop; apex with dorsal surface deeply concave and with dorsolateral margin sclerotized, venter with an elongate sclerite whose apex is scooplike.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 6 Mar 1984, C.M. & O.S. Flint, Jr. USNM Type.

Leucotrichia brochophora, new species

FIGURES 82-84

This species is also a member of the *melleopicta* group, rather similar to *L. interrupta*, new species. From the latter it is distinguished by the rounded apex of the claspers, the row of short truncate setae dorsolaterally on the ninth tergum, and the very short eighth sternum.

ADULT.—Length of forewing, 5.5 mm. Color fuscous, marked with grayish-green; front of head, tegulae and mesonotum laterally grayish-green (fuscous centrally); antennae fuscous, annulate with greenish-white hair; forewing fuscous, with basal $\frac{3}{4}$ grayish-green, with apical green margin very oblique across wing, anterior and posterior margins of wing narrowly fuscous. Head with 3 ocelli, unmodified (as in *melleopicta*). *Male genitalia*: Sixth sternum with a small posteromesal point; seventh sternum damaged here, but probably with a process of some sort. Eighth sternum relatively short, with posterior margin produced laterally, in ventral

aspect indistinct mesally, apparently concave. Ninth segment with anterolateral angle rounded; posterolateral margin with a dense row of long setae ventrally, with a dense cluster of 6-8 enlarged, truncate setae dorsolaterally; with anterodorsal margin slightly concave. Tenth tergite large, apical margin strongly sclerotized; lateral penis sheath rounded. Subgenital plate with ventral arm sharply pointed apically (in ventral aspect tip bifid), curving dorsad basally underneath penis sheath. Clasper elongate, slightly curved, blunt apically. Phallus tubular basally; midlength complex bearing a large basal loop arising from a large basolateral hooplike structure; apical section with paired dorsal projections and a pair of ventral processes.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr. USNM Type.

Leucotrichia interrupta, new species

FIGURES 85-87

L. interrupta is a member of the *melleopicta* group, quite similar in most respects to the preceding species, *L. brochophora*, new species. It is to be recognized by the elongate eighth sternum which is very shallowly emarginate posteroventrally, and the long, rather slender and pointed claspers.

ADULT.—Length of forewing, 3.5-4 mm. Color fuscous, marked with yellowish-green; front of head, tegulae, and mesonotum laterally (fuscous centrally) yellowish-green; forewing fuscous with basal $\frac{3}{4}$ yellowish-green, with fuscous hair along anterior and posterior margin. Head with 3 ocelli, unmodified (as in *melleopicta*). *Male genitalia*: Seventh sternum with a posteromesal process continuous into a longitudinal carina on venter (process broken off shortly beyond base and keel appearing damaged in type). Eighth sternum slightly produced posteriorly, posterior margin shallowly concave in ventral aspect. Ninth segment with anterolateral angle rounded; posterolateral margin with a long row of stout setae; dorsally with anterior margin concave. Tenth tergite large and strongly sclerotized; lateral penis sheath indistinguishable from phallus. Subgenital plate pointed apically, gradually widened basad. Clasper elongate, widening slightly basad. Phallus tubular basally, with a midlength complex and basal loop; apical section indistinct, but with a pair of flared lateral spines subtending a membranous lobe.

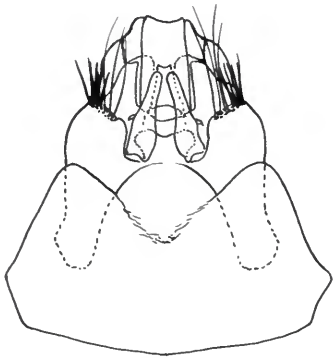
MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [on road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratype: Same data as holotype, 1♀.

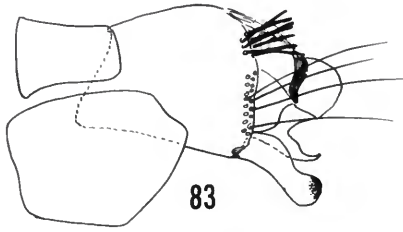
Leucotrichia ayura, new species

FIGURES 88-90

Also a member of the *melleopicta* group, *L. ayura* appears to



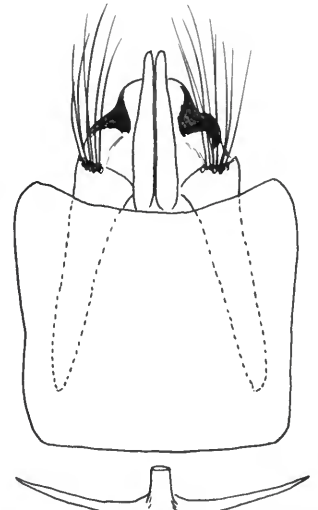
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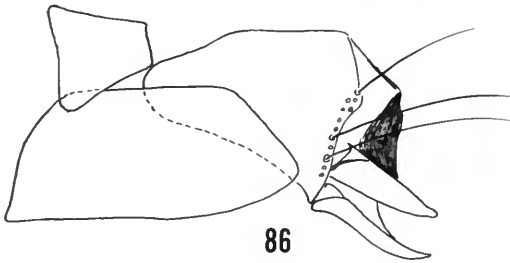
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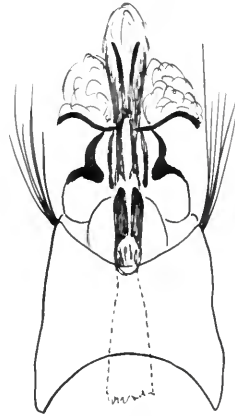
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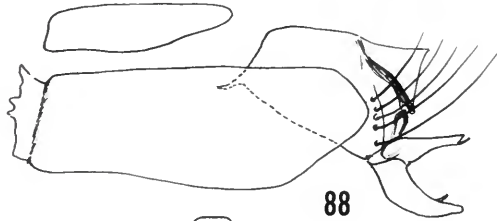
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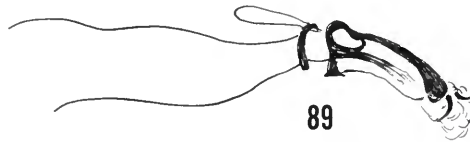
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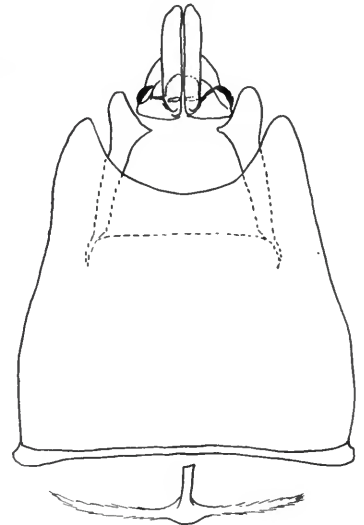
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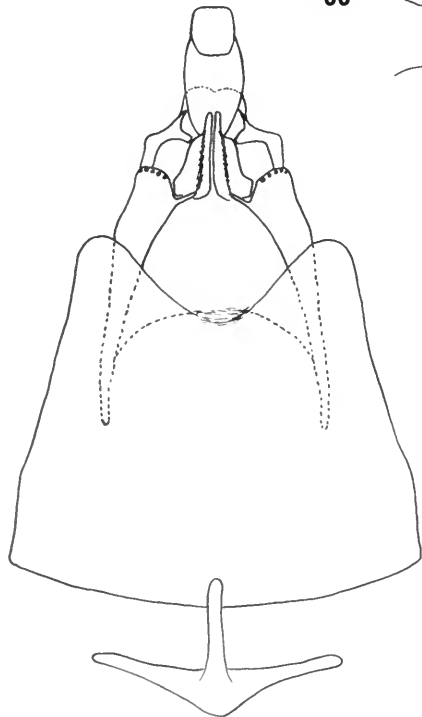
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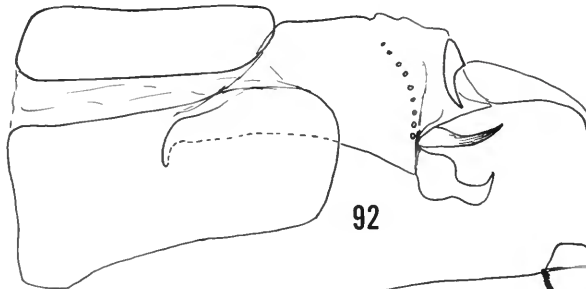
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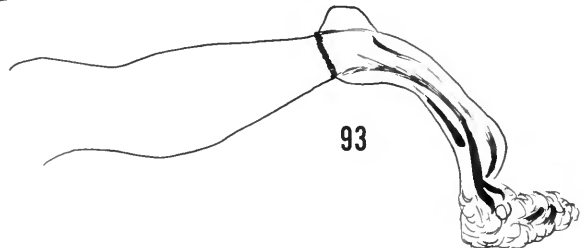
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91



92



93

FIGURES 82-93.—*Leucotrichia brochophora*, new species: 82, male genitalia, ventral; 83, same, lateral; 84, phallus, lateral. *L. interrupta*, new species: 85, male genitalia, including seventh sternal process, ventral; 86, same, lateral; 87, same, including phallus, dorsal. *L. ayura*, new species: 88, male genitalia, lateral; 89, phallus, lateral; 90, genitalia, including seventh sternal process, ventral. *L. inops*, new species: 91, male genitalia, including seventh sternal process, ventral; 92, same, lateral; 93, phallus, lateral.

be most closely related to *L. inops*, new species. The very elongate eighth sternum, pointed anterolateral angle of the ninth tergum, and structure of the apical portion of the phallus render this species very distinctive.

ADULT.—Length of forewing, 2-3 mm. Color fuscous marked with yellowish-green; front of head, tegulae, and mesonotum with yellowish-green hairs; forewing fuscous with basal half yellowish-green. Head with 3 ocelli, unmodified (as in *melleopicta*); antennae unmodified. *Male genitalia*: Seventh sternum with a short posteromesal process. Eighth sternum produced posteriorly at lateral angle, posterior margin broadly concave in ventral aspect. Ninth segment with anterolateral angle slightly produced; posterolateral margin with a row of 5-7 stout setae; dorsally with anterior margin shallowly concave. Tenth tergite poorly developed; lateral penis sheath short. Subgenital plate with dorsal arm poorly developed; ventral arm projecting, inflated basally, apex trough-like. Clasper slightly curved, tapering, with a small spine dorsally. Phallus tubular basally, with midlength complex bearing a small basal loop; apex with a pair of dark sclerites dorsally and a pair of small laterally directed apical spines.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km NW Medellín [road to San Pedro], 13 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 2♂, 3♀; same, but 20 Feb 1984, C.M. and O.S. Flint, Jr., 1♀. Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 14 Feb 1983, O.S. Flint, Jr., 1♂, 2♀. Quebrada La Ayurá, Envigado (trap B), Apr 1983-Mar 1984, U. Matthias, 8♂, 8♀; same, but 21 Feb 1984, C.M. & O.S. Flint, Jr., 1♂.

Leucotrichia inops, new species

FIGURES 91-93

This very distinctive species is a member of the *melleopicta* group, most similar to *L. ayura*, new species. However, the very broad apicolateral margin of the eighth sternum, the elongate pointed anterolateral angle of the ninth tergum, the pointed and hooked apices of the claspers, and phallus lacking most of the midlength complex and with a decurved apical section, are all unique to this species.

ADULT.—Length of forewing, 3-3.5 mm. Color fuscous, marked grayish-green; front of head, tegulae, and mesonotum with grayish-green hair; forewing fuscous, with grayish-green hair for basal 2/3, with fuscous spots on posterior margin near midlength and basally in green area. Head with 3 ocelli,

unmodified (as in *melleopicta*), antennae unmodified. Abdominal segments 4-7 in male with dense tufts of long hair dorsolaterally; tergum 8 with entire surface bearing long hair. *Male genitalia*: Seventh sternum with a posteromesal process about half length of sternum. Eighth sternum with posterolateral margin very broad and convex, posteroventral margin concave. Ninth segment with anterolateral angle strongly produced, tip decurved; posterolateral margin with a row of stout setae; dorsally with anterior margin deeply concave. Tenth tergite typical; lateral penis sheath long, gently decurved. Subgenital plate connecting tenth tergites ventrally; ventral arm lightly sclerotized, inflated basally, pointed apically. Clasper with base enlarged both dorsally and ventrally, apex narrow, tip sharply upturned. Phallus tubular basally, lacking midlength complex and basal loop, but with a small middorsal crest; apex tubular, long, decurved, with a pair of long internal sclerites ending in angled apices, ventrally with a darkened sclerite at midlength, with a pair of small apical spines.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km E Medellín [road to Sta. Elena], 6 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Quebrada La Iguaña, 17 km NW Medellín [road to San Jerónimo], 14-15 Feb 1983, O.S. Flint, Jr., 1♂, 1♀; same, but 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♀. DPTO. NARIÑO: 4 km S La Florida, 7,000' (~2,100 m), 15 Jan 1963, H.B. Cunningham, 1♂ (INHS).

Leucotrichia species

A single female was taken in the trap at Quebrada La Jiménez that is different from *L. fairchildi* Flint which was common there. It cannot be associated at this time with any of the other species which are herein described.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), 22 Jun 1983, U. Matthias, 1♀.

Genus *Alisotrichia* Flint

The genus is widespread through Mexico, Central America, Venezuela, and the West Indies. This is the first record from Colombia, although it is not at all surprising. Males of three species have been taken, and a fourth is represented by a single female only, indicating that a significant fauna may be expected in appropriate sites.

The larvae of several species from the West Indies have been described (Flint, 1964b, 1968a, 1968b, 1970). The records of the genus from North America (Flint, 1970; Wiggins, 1977) have proven to be erroneous, these larvae being early instars of *Leucotrichia*. Based on the West Indian species, the larvae are free living on wet boulders and bedrock, usually at the water's edge or in areas kept wet by spray. They construct their silken shelters immediately prior to pupating. Their larval food is not known, but probably consists of organic ooze that they scrape from the substrate.

Key to Antioquian Species of *Alisotrichia*

1. Spurs 1,3,4 *A. adunca*, new species
Spurs 0,2,4 2
2. Eighth sternum with posterior margin bearing a long lateral process whose tip is hooked mesad *A. latipalpis*, new species
Eighth sternum with a small lateral point, bearing a brush of large setae
. *A. ventricosa*, new species

Alisotrichia latipalpis, new species

FIGURES 94-99

This species is apparently rather closely related to *A. lobata* Flint from Dominica. Both have a similarly shaped eighth sterna, and elongate processes both anterolaterally and posterolaterally from the ninth segment. They are easily distinguished by the much longer process posterolaterally on the eighth sternum, and the rather differently formed ninth sternal area in *A. latipalpis*.

ADULT.—Length of forewing, 1.5 mm. Color light brown in alcohol. Ocelli 2 in male and female. Head in male lightly sclerotized anteromesally and bulging; labial palpi with first 2 segments small, globose; third elongate, enlarged apicad; fourth large, almost circular in outline; fifth narrow, elongate. Antenna in male with scape enlarged, covering almost a third of face, setose internally; pedicel globose; with 16 flagellomeres, most being twice as wide as long. Female with head and palpi unmodified; antenna with scape and pedicel large, globose, with 15 flagellomeres, those at midlength being narrow and elongate, the others about as long as wide. Spurs 0,2,4; male foretibia enlarged for basal half. *Male genitalia*: Seventh sternum narrow, with a small midventral point. Eighth sternum elongate with a long, narrow, posterolateral process and a smaller, ovoid, dorsolateral lobe. Ninth segment with very long, slender, anterolateral rods, with an indistinct midventral lobe which articulates apicad with a U-shaped sclerite, together with an apical structure appearing oval in ventral aspect but as a rounded excision in lateral aspect; with a long, slender lateral process ending in a seta; dorsolaterally with a row of large setae. Tenth tergum mostly membranous, with a pair of dorsal darkened sclerites. Phallus a simple, slightly sinuous tube, flared basally.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), 22 Jun 1983, U. Matthias. USNM Type.

Paratypes: Same data as holotype, but Jun-Sep 1983, 2♂, 3♀.

Alisotrichia ventricosa, new species

FIGURES 100-104

Another species related to *A. lobata* Flint and *A. latipalpis*, new species, this species is rather different from either although

agreeing in spur count, structure of the male head, antennae, and in the long anterolateral rods of the ninth segment. It differs from all in having a cluster of enlarged setae laterally on the eighth sternum, a long midventral process projecting anteriorly from the ninth segment, and in the very distinctive phallus.

ADULT.—Length of forewing, 1.5 mm. Color light brown in alcohol. Ocelli 2 in male and female. Antenna in male with scape enlarged, reniform, partially covering face, pedicel slightly inflated, globose, with 16 flagellomeres; female with both scape and pedicel enlarged (less than in male), globose, with 15 flagellomeres. Spurs 0,2,4. *Male genitalia*: Seventh sternum narrow, with a small but complex posteromesal point. Eighth sternum elongate, with posterolateral brushes of enlarged setae. Ninth segment with very long, slender, anterolateral rods, and a midventral rodlike process directed anteriorly with a sigmoid posterolateral thickening; apicoventrally, in lateral aspect, with a rounded excision, in ventral aspect this appears as a darkly outlined oval. Tenth tergum with a pair of dorsolateral darkened sclerites. Phallus with base flared, a narrow basal half, slightly enlarged just beyond midlength, at which point 2 pairs of slender sclerites project posteriorly, the lateralmost being longest; at $\frac{3}{4}$ length widened and bearing a dark transverse sclerite and mesally a long, slender process.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), 22 Jun 1983, U. Matthias. USNM Type.

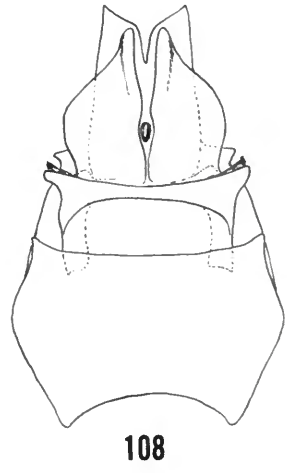
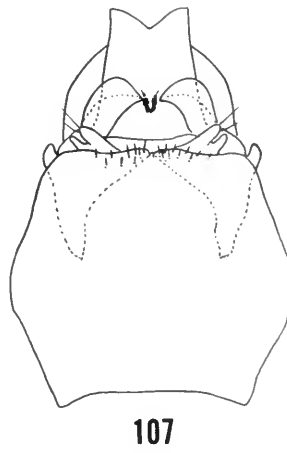
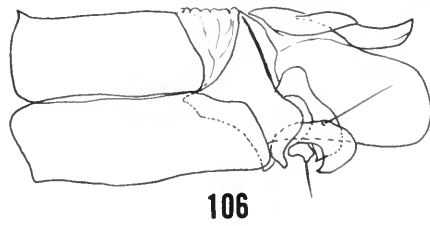
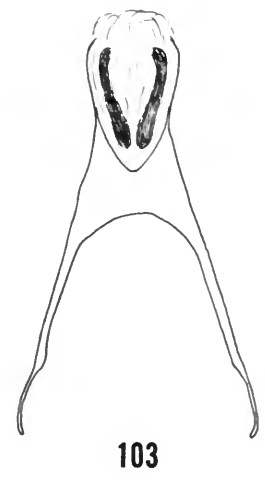
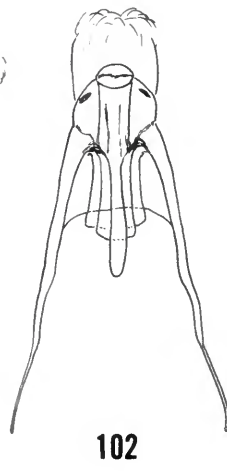
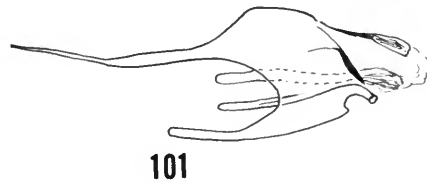
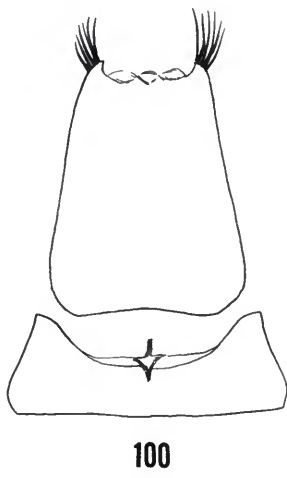
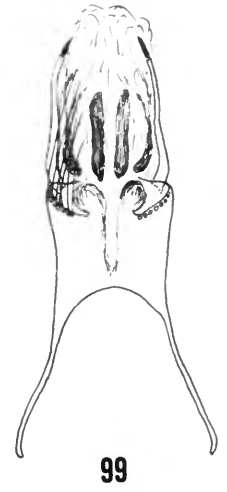
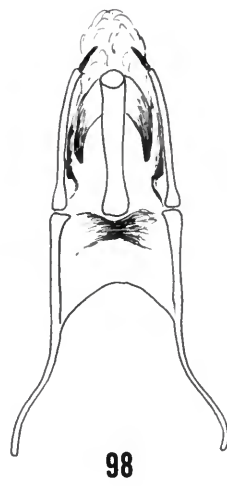
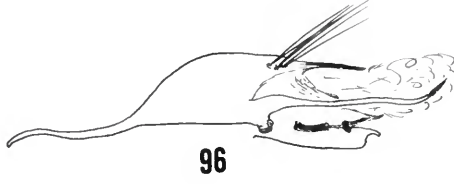
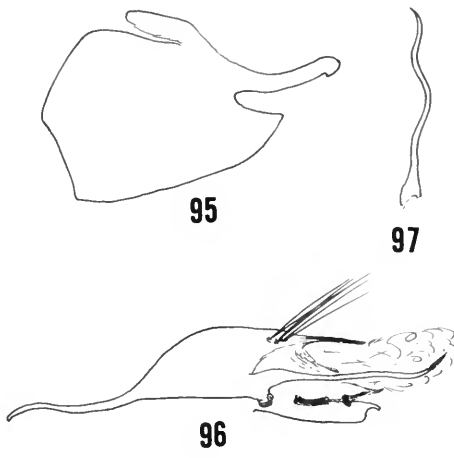
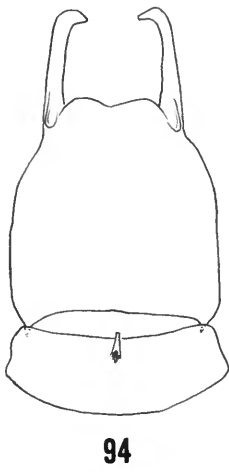
Paratypes: Same data as holotype, but May-Oct 1983, 73♂, 84♀.

Alisotrichia adunca, new species

FIGURES 105-108

This species is very close to *A. wirthi* Flint, which also possesses an apical spur on the foreleg (originally overlooked because it is quite small in this species). Distinguishing

FIGURES 94-108.—*Alisotrichia latipalpis*, new species: 94, male seventh and eighth sterna, ventral; 95, eighth sternum, lateral; 96, ninth segment and attached structures, lateral; 97, phallus, dorsal; 98, ninth segment and attached structures, ventral; 99, same, dorsal. *A. ventricosa*, new species: 100, male seventh and eighth sterna, ventral; 101, ninth segment and attached structures, lateral; 102, same, ventral; 103, same, dorsal; 104, phallus, dorsal. *A. adunca*, new species: 105, phallus, dorsal; 106, male genitalia, lateral; 107, same, ventral; 108, same, dorsal.



characters are found in the male genitalia, especially the tenth tergum which is very broad basally, in the long, tubular penis sheath, and to a lesser degree in the shape of the claspers and related parts.

ADULT.—Length of forewing, 2.5 mm. Color fuscous with purplish metallic reflections. Antennae and legs stramineous; forewing with indistinct pale maculae. Ocelli 3; head and antennae unmodified. Spurs 1,3,4. No sternal processes. *Male genitalia:* Eighth tergum large, broadening slightly laterad; sternum slightly produced posteriad, posterior margin with short, spinous setae. Ninth segment produced anterolaterally, narrow. Tenth tergite broad basally, narrowing apicad, apex with a narrow, elongate, ventral root. Clasper broadened apically, produced ventromesad, hooklike; with a narrow, bandlike subgenital plate internally to claspers which bears a small, midventral knob. Penis sheath long, tubular, divided dorsomesally. Phallus narrow for basal third, then abruptly widened, at which point a complex of sclerites gives rise to a single mesal spine directed apicad, and with point curved dorsad, apex long and membranous.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Agua Blanca, 10 km E Medellín [road to Guarne], 7 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Quebrada El Pozo, 8 km W El Peñol, 9 Feb 1983, O.S. Flint, Jr., 1♂, 1♀.

Alisotrichia species

A single female of an apparent fourth species was taken with the two new species in emergence trap C in June 1983. There being no known males, the species is left undescribed.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), June 1983, U. Matthias, 1♀.

Genus *Hydroptila* Dalman

This genus of worldwide distribution is also well represented in the Department of Antioquia where six species have been taken. The association of females with males is circumstantial, based only on the collection of the two sexes together. This has resulted in uncertainty in the identity of the females assigned to *H. helicina*, new species. Either the females of *H. helicina* and *H. spada*, new species, are indistinguishable, or, more probably, the female of one is not present in our collections. This female morphotype is here assigned to *H. helicina* on the basis of the similarity of its genitalia to that of the closely related *H. argentinica* Flint, but on the basis of collecting site it is equally possible to be the female of *H. spada*.

The larvae of *Hydroptila* are well known and construct small, compressed, silken cases. The genus is widely distributed in both lotic and lentic situations provided the algal food of the larvae is present. The life history and feeding habits of a European species is well described by Nielson (1948).

Key to Antioquian Species of *Hydroptila*

1. Phallus with an apical process in the form of a spiral around the central tubule *H. helicina*, new species
Apical processes of phallus not in form of a spiral 2
2. Apical section of phallus tubular, with a pointed, lateral process from apex, ejaculatory duct extending down center of this tube and its apex may extend beyond pointed process 3
Apical section of phallus consisting of a thin process, whose tip may be pointed laterad, ejaculatory duct extending freely from near base of process 4
3. Clasper in ventral aspect with distinct dark spots at apicolateral and apicomesal angles; ejaculatory duct extending beyond tip of central tube *H. constricta* Bueno-Soria
Clasper lacking the apicomesal dark spot; ejaculatory duct not extending beyond apex of phallus *H. inornata*, new species
4. Lateral process of phallus broadened subapically, apex angled laterad *H. spada*, new species
Lateral process at apex of phallus attenuate apically, slightly curved 5
5. Clasper in ventral aspect with a single dark spot centrally near apex *H. unicuspis*, new species
Clasper lacking dark spots, but with apex slightly rolled which appears as a dark line *H. narifer*, new species

Hydroptila constricta Bueno-Soria

FIGURES 109, 110, 128

Hydroptila constricta Bueno-Soria, 1984:99.

This species was recently described from Mexico, Belize, and Honduras. Its occurrence in Colombia thus greatly extends its range. It appears to be quite common in the Department of Antioquia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 3♂, 5♀; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 7♀. Quebrada La Mosca, 1 km W Guarne, 2 Mar 1984, C.M. & O.S. Flint, Jr., 2♀. Quebrada Potrereros, W La Fé, 26 Feb 1984, C.M. & O.S. Flint, Jr., 3♀. Quebrada La Cebolla, El Retiro (trap A), May–Sept 1983, U. Matthias, 3♂. Quebrada La Ayurá, Envigado (trap B), Jul 1983–Mar 1984, U. Matthias, 2♂, 6♀.

Hydroptila inornata, new species

FIGURES 111–113, 129

This species with its very simple apical section of the phallus is not apparently closely related to any other described New World species. The male genitalia are distinctive in the combination of the lack of process laterad to the clasper, presence of a single dorsolateral point on the clasper and structure of the phallus.

ADULT.—Length of forewing, 2–3 mm. Color in alcohol, brown. Seventh sternum with a distinct posteromesal point. **Male genitalia:** Ninth segment with anterior margin produced laterally; posterior margin not produced laterad of clasper base. Tenth tergum elongate, longer than claspers, with ventrolateral margins lightly sclerotized. Subgenital plate broadly rounded; submesal setae not apparent. Clasper widened apicad, in ventral aspect with tip slightly produced laterad, with a single, dark point at apicodorsal angle. Phallus with a long basal section; apex bearing a spiral process, apical section slightly wider basally, apex appears to have a very small, laterally directed point. **Female genitalia:** Eighth sternum with a mesal structure slightly widened and more strongly sclerotized for posterior third, with 2 pairs of posteroventral marks; lateral margins heavily sclerotized, posteromesal margin broadly produced, dorsal margin produced mesally and strongly sclerotized.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), Feb–Apr 1984, U. Matthias. USNM Type.

Paratypes: Same data as holotype, but May 1983–Apr 1984, 1♂, 6♀.

Hydroptila narifer, new species

FIGURES 114–117, 130

Together with *H. grenadensis* Flint, *H. bidens* Flint, *H. coscaroni* Flint, and *H. antilliana* Flint, this species forms a distinctive subgroup in the genus *Hydroptila*. From its congeners, *H. narifer* is to be recognized by the presence of a small lobe from the apicoventral margin of the subgenital plate, and the elongate shape and rolled tip of the claspers.

ADULT.—Length of forewing, 2–3 mm. Color silvery-gray; forewing marked with scattered, small, dark flecks. Seventh sternum with a distinct posteromesal point. **Male genitalia:** Ninth segment with anterior margin produced laterally; posterior margin bearing a pointed process laterad of clasper base. Tenth tergum with ventrolateral margin sclerotized, slightly shorter than claspers. Subgenital plate with an apicomeral lobe from venter which appears to bear a small seta. Clasper enlarged apicad, dorsal margin with a subapical seta; apical margin slightly rolled laterad, lateral margin slightly darkened. Phallus with a long basal section; apex bearing a spiral process, a slender ejaculatory duct that is mostly free, and a slender sclerotized process that tapers to a point and is evenly curved. **Female genitalia:** Eighth sternum with a mesal, ovoid plate, posterior margin of venter produced into a bilobate plate, dorsal margin truncate, with a strongly sclerotized rim, laterally with a complex pocket.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), 4 Jul 1983, U. Matthias. USNM Type.

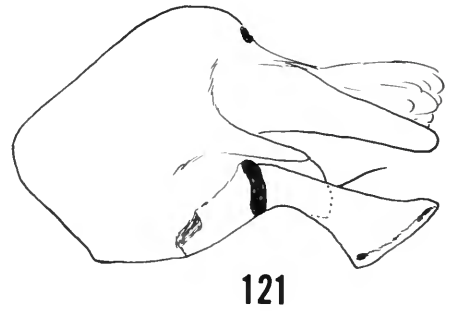
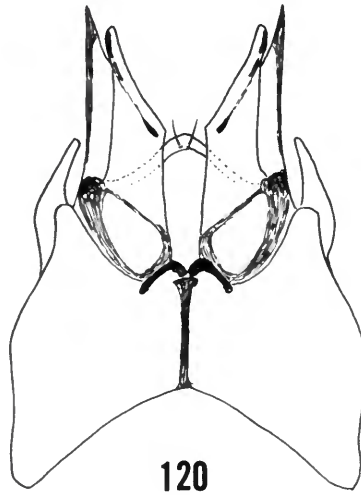
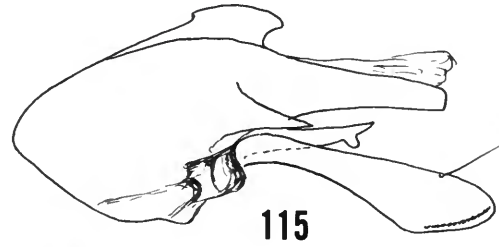
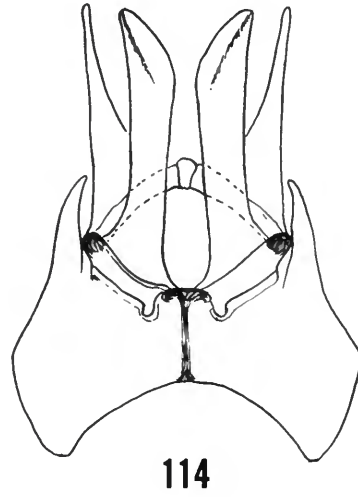
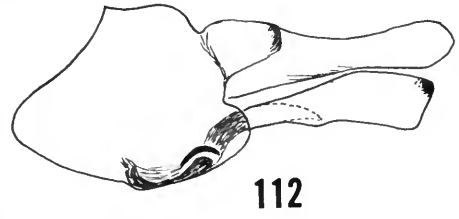
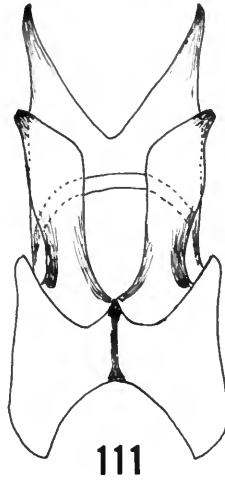
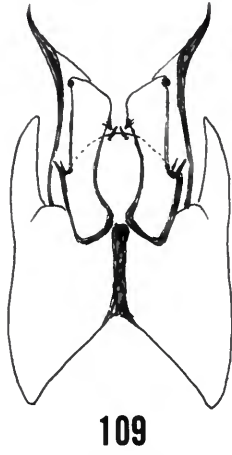
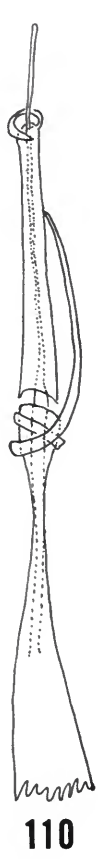
Paratypes: Same data as holotype, 1♂, 2♀; May–Sep 1983, 3♂, 9♀. “Finca Velásquez,” Sopetrán, 14 Feb 1983, O.S. Flint, Jr., 1♂, 3♀. Quebrada La Ayurá, Envigado (trap B), Apr–Nov 1983, U. Matthias, 3♂, 2♀. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 2♂, 12♀. Río Aurrá, km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr., 4♂, 21♀.

Hydroptila spada, new species

FIGURES 118–121

The structure of the apical portion of the phallus relates this species to the preceding group. However, the apical phallic region is quite different in detailed appearance, as is the shape and appearance of the clasper. Although no female is here attributed to this species, the female form described under *H. helicina*, new species, was also taken with *H. spada*. See the comments in the introduction to *Hydroptila* and under *H. helicina* for more information.

ADULT.—Length of forewing, 3–4 mm. Color silvery-gray, forewing marked with small dark flecks. Seventh sternum with



FIGURES 109–121.—*Hydroptila constricta* Bueno-Soria: 109, male genitalia, ventral; 110, phallus, dorsal. *H. inornata*, new species: 111, male genitalia, ventral; 112, same, lateral; 113, phallus, dorsal. *H. narifer*, new species: 114, male genitalia, ventral; 115, same, lateral; 116, phallus, dorsal; 117, tip of phallus, enlarged, dorsal. *H. spada*, new species: 118, phallus, dorsal; 119, tip of phallus, enlarged, dorsal; 120, male genitalia, ventral; 121, same, lateral.

a distinct, posteromesal point. *Male genitalia*: Ninth segment with anterior margin produced laterally; posterior margin bearing a pointed process laterad of clasper base. Tenth tergum with ventrolateral margin slightly sclerotized, of same length as clasper. Subgenital plate narrowly rounded, with a pair of small apicommesal setae. Clasper enlarged apicad, dorsal margin with a large seta, apical margin rolled laterad with indistinctly darkened marks. Phallus with a long basal section having apical half distinctly narrower than basal; apex bearing a spiral process, a slender, free, ejaculatory duct and a blade-like process having a broad base and a tip pointed and sharply angled to one side.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 6 Mar 1984, C.M. and O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 3♂; same, but 24 Feb 1983, O.S. Flint, Jr., 6♂.

Hydroptila unicuspis, new species

FIGURES 122–124, 133

This is a very distinctive species, not clearly related to any other described New World species, although similar in general to the last two described species in the number of apical processes of the phallus. The claspers are unique in shape and structure, and the apical section of the phallus is distinctive in detail of structure.

ADULT.—Length of forewing, 2–2.5 mm. Color in alcohol uniformly brown. Seventh sternum with a distinct posteromesal point. *Male genitalia*: Ninth segment with anterior margin produced anteroventrally; posterior margin bearing a rounded process laterad of clasper base. Tenth tergum elongate, extending well beyond claspers, with ventrolateral margin strongly sclerotized. Subgenital plate broadly rounded, without apparent submesal setae. Clasper narrow, rounded apicad; with a single, dark lateral point subapically. Phallus with a very long basal section; apex bearing a spiral process extending apicad parallel to apical section which is divided into a pointed process and a longer, more membranous process. *Female genitalia*: Eighth sternum with a mesal trilobate structure, whose posterior half is more strongly sclerotized than the anterior lobe, with 2 pairs of indistinct, posteriorly directed marks; posterior margin lightly sclerotized ventrally, projecting, nail-like; dorsal margin more strongly sclerotized with a mesal, thickened ridge projecting slightly.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 21 May 1983, U. Matthias. USNM Type.

Paratypes: Same data as holotype, but 17 Aug 1983, 1♂, 1♀.

Hydroptila helicina, new species

FIGURES 125–127, 131, 132

This species, *H. spirula* Bueno-Soria, and *H. argentinica* Flint, form a very distinctive group based on the spiral apex of the phallus. From both, *H. helicina* is to be recognized by the very slender basal portion of the apical section of the phallus, and the very broad apex of the clasper. I can detect no differences between females taken with *H. spada*, new species, and *H. helicina*. Perhaps one is incorrectly associated, or alternatively the females of the two species are so similar as to be inseparable. I have no way to resolve this question and so describe the female under *H. helicina* but must warn that the association could be incorrect.

ADULT.—Length of forewing, 2.5–3.5 mm. Color in alcohol, pale brown. Seventh sternum bearing a distinct posteromesal spine. *Male genitalia*: Ninth segment with anterior margin broadly produced laterally; posterior margin bearing a pointed process laterad of clasper base. Tenth tergum with ventrolateral margin lightly sclerotized, same length as claspers. Subgenital plate broadly rounded with a pair of submesal setae. Clasper enlarged apicad, dorsal margin with a large seta; apical margin rolled laterad, darkened, especially so at dorsal and ventral extremities. Phallus with basal section extremely long and slender; bearing a spiral process just basad of apical section which is long and slender, apex bearing a helical process spiralling around a central ejaculatory duct. *Female genitalia*: Eighth sternum bearing a mesal trilobate structure with posterolateral marks; posterior margin lightly sclerotized ventrally, apparently concave mesally, dorsal margin heavily sclerotized with a deep mesal emargination.

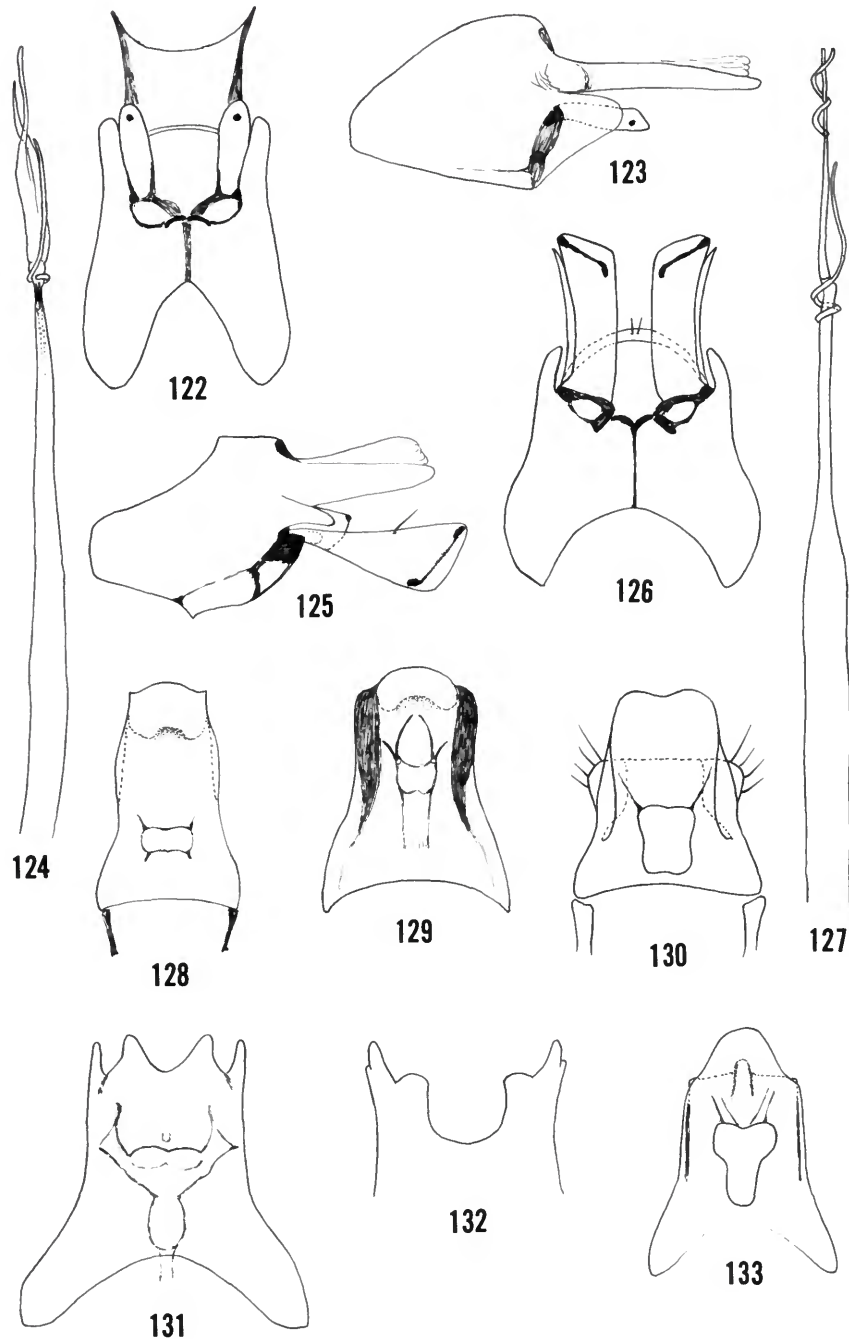
MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Quebrada La Ayurá, Envigado (trap B), Apr–Nov 1983, U. Matthias, 17♂, 19♀. DPTO. RISARALDA: 4 km E Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 1♂.

Genus *Oxyethira* Eaton

This is another genus that is worldwide in distribution and well represented and varied in the Neotropical realm (Kelley, 1983). We have taken adult males and females of two species, but also possess females of two more species indicating that more species must be expected in the region.

The immature stages are well known. They construct silken cases with a narrow neck and broad, compressed, posterior portion. Full descriptions of the larvae are to be found in Nielsen (1948) or Wiggins (1977). They feed primarily on algae, but may consume other organic matter in the environment, and live in both lentic or lotic situations.



FIGURES 122–133.—*Hydroptila unicuspis*, new species: 122, male genitalia, ventral; 123, same, lateral; 124, phallus, dorsal. *H. helicina*, new species: 125, male genitalia, lateral; 126, same, ventral; 127, phallus, dorsal. *H. constricta* Bueno-Soria: 128, female eighth sternum, ventral. *H. inornata*, new species: 129, female eighth sternum, ventral. *H. narifer*, new species: 130, female eighth sternum, ventral. *H. helicina*, new species: 131, female eighth sternum, ventral; 132, apex of same, dorsal. *H. unicuspis*, new species: 133, female eighth sternum, ventral.

Key to Antioquian Species of *Oxyethira*

- Ninth sternum produced posteriad as a broad scoop, with its apex divided mesally
 *O. parce* (Edwards and Arnold)
 Ninth sternum not produced at all, with a pair of pointed lateral processes
 *O. absona*, new species

Oxyethira parce (Edwards and Arnold)

FIGURES 134-137, 143, 144

Protophila parce Edwards and Arnold, 1961:405.—Edwards, 1973:496.—Flint and Reyes, in press.

This species has recently been resurrected (Flint and Reyes, in press) from the synonymy of *O. azteca* (Mosely), to which it is very closely related (Figures 138-142). This species is widely distributed from the southern United States south to Chile.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Ayurá, Envigado (trap B), Apr-Nov 1983, U. Matthias, 13♂, 38♀. Río Aurrá, km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr., 8♂, 13♀. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 6♂, 5♀. Río Medellín, 5 km S Caldas, 16 Feb 1983, O.S. Flint, Jr., 3♂, 8♀. In addition, I have material of the species from the Departments of Chocó, Meta, and Valle del Cauca in Colombia.

Oxyethira absona, new species

FIGURES 145-147

This odd species is closely related to *O. quinquaginta* Kelley with which it shares the elongate process of sternum 7, the vestigial claspers, asymmetrical arms of the subgenital plate, and large number of antennal segments. It is easily distinguished by the details of shape of most of the parts and especially by the caliper-shaped sclerite of the phallus.

ADULT.—Length of forewing, 2.5 mm. Color pale brown; forewing pale brown with a few white marks and fuscous maculae. Antenna with 48 segments. Segment 7 with an elongate ventromesal process. *Male genitalia*: Segment 8 with a broad, U-shaped midventral excision; laterally produced slightly and terminating in a 90° angle. Segment 9 completely withdrawn in abdomen, extending anteroventrally into segment 6; dorsum membranous; posteroventral margin bearing curved small humps. Subgenital plate with two arms unequal in length, both pointed apically and broadened ventrally. Phallus with a twisted, apicolateral, ribbonlike sclerite arising at midlength, at which point is a caliperlike, heavily sclerotized structure, one arm of which bears the ejaculatory duct, and all is enclosed in a membranous sac.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 5 Jun

1983, U. Matthias. USNM Type.

Paratypes: Same data as holotype, but May 1983-Feb 1984, 31♂, 59♀. Quebrada Potreros, W La Fé, 19 Feb 1984, C.M. & O.S. Flint, Jr., 1♀; same, but 26 Feb 1984, 1♂, 10♀. Quebrada Mosca, 1 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 1♀; same, but 2 Mar 1984, C.M. and O.S. Flint, Jr., 1♂, 1♀. Quebrada La Agudelo, 2 km E El Retiro, 25 Feb 1984, C.M. & O.S. Flint, Jr., 1♀. Río Medellín, 5 km S Caldas, 16 Feb 1983, O.S. Flint, Jr., 1♂, 3♀.

Oxyethira species

Females of two additional species, very distinctive based on internal genital structures, were taken in the Department. They are listed so as to alert readers to the presence of additional species.

Oxyethira species A

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 10 km E Medellín [road to Las Palmas], 21 Feb 1984, C.M. & O.S. Flint, Jr., 1♀. Quebrada La Mosca, 1 km W Guarne, 2 Mar 1984, C.M. & O.S. Flint, Jr., 1♀.

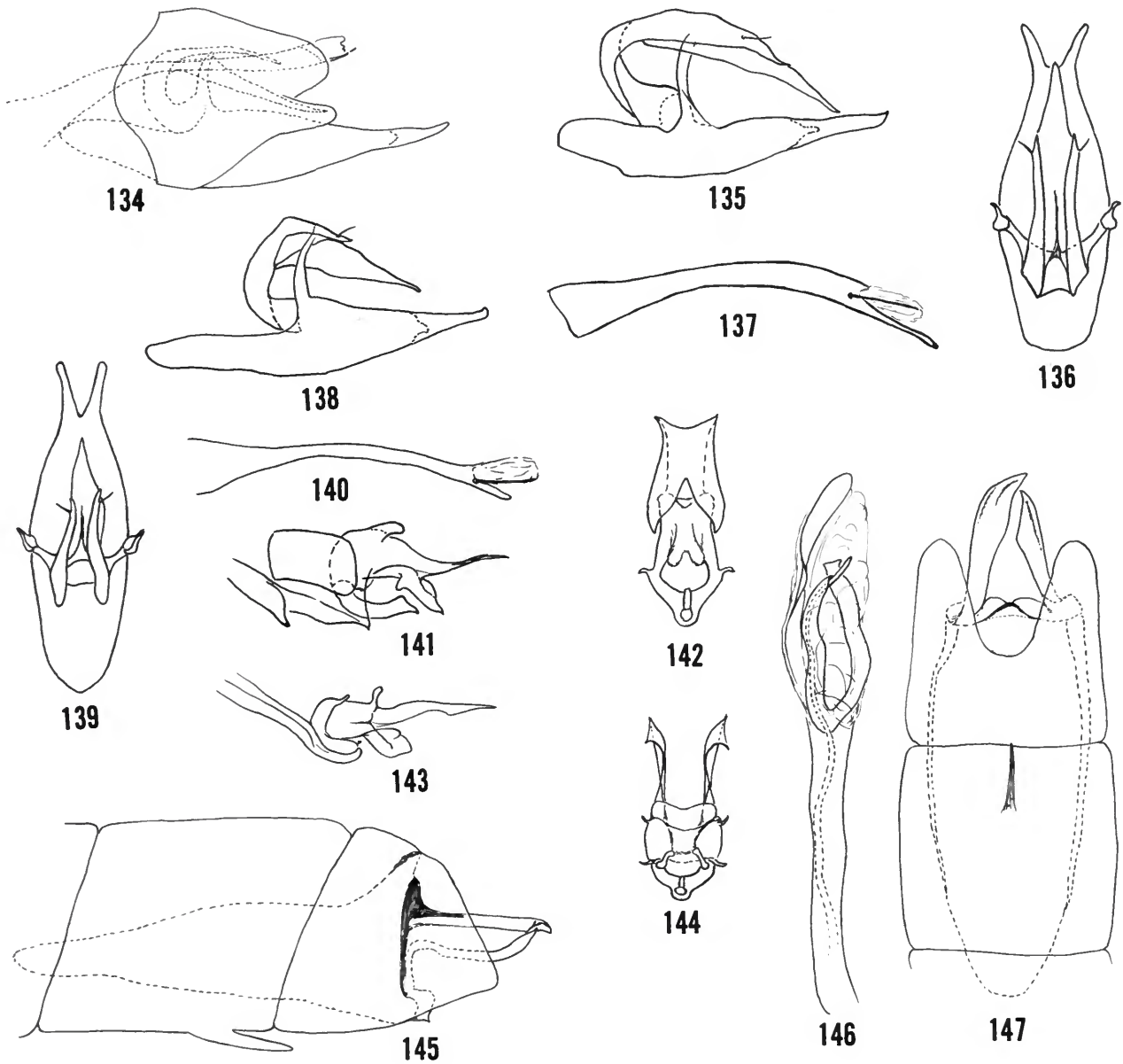
Oxyethira species B

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada El Retiro, 16 km NW Medellín [road to San Pedro], 20 Feb 1984, C.M. & O.S. Flint, Jr., 1♀.

Genus *Neotrichia* Morton

This is a genus of exclusively New World distribution. It is most diverse in Central and South America, but outliers are found as far as Canada, Chile, and the Greater and Lesser Antilles. Fifty species have already been described from the Neotropics, but studies being undertaken by S.C. Harris, who studied the material here enumerated, indicate that the number of species will increase many-fold.

The larvae construct solid, cylindrical and slightly tapered cases made of small sand grains. A number of larval descriptions exist: Botosaneanu and Sykora (1973), Flint (1964b), and Wiggins (1977). There are no reports on the larval food.



FIGURES 134-147.—*Oxyethira parce* (Edwards and Arnold): 134, male genitalia, lateral; 135, ninth segment and beyond, lateral; 136, same, dorsal; 137, phallus, lateral. *O. azteca* (Mosely): 138, male ninth segment and beyond, lateral; 139, same, dorsal; 140, phallus, lateral; 141, female vaginal sclerites, lateral; 142, same, ventral. *O. parce* (Edwards and Arnold): 143, female vaginal sclerites, lateral; 144, same, ventral. *O. absona*, new species: 145, male genitalia, lateral; 146, phallus, dorsal; 147, male genitalia, ventral.

Key to Antioquian Species of *Neotrichia*

- Tenth tergum bearing an apical pair of horn-like processes . . . *N. tauricornis* Malicky
 Tenth tergum a large rounded lobe bearing a basolateral, setiferous process
 *N. colombiensis* Harris

***Neotrichia colombiensis* Harris**

FIGURES 148-151

Neotrichia colombiensis Harris, 1990:257.

This species was recently described from the material taken by emergence trap C during this survey. It is unknown from any other locality.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), 4 July 1983, U. Matthias, 1♂ (holotype); 2 Sep 1983, 1♂, 1♀ (paratypes).

***Neotrichia tauricornis* Malicky**

FIGURES 152-156

Neotrichia tauricornis Malicky, 1980:220.

This species was recently described from the Lesser Antillean island of Guadeloupe, and is now recorded from Colombia. It was only taken in the emergence traps, but at both the highest, wettest and lowest, driest sites, indicating a rather broad ecological tolerance.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 3 July 1983, U. Matthias, 1♂. Quebrada La Jiménez, Sopetrán (trap C), 2 Jun-1 Oct 1983, 2♂, 1♀.

Genus *Ochrotrichia* Mosely

This genus is divided into 2 subgenera, the nomotypical and *Metrichia*. Both are limited to the New World. Details are given under each of the two subgenera.

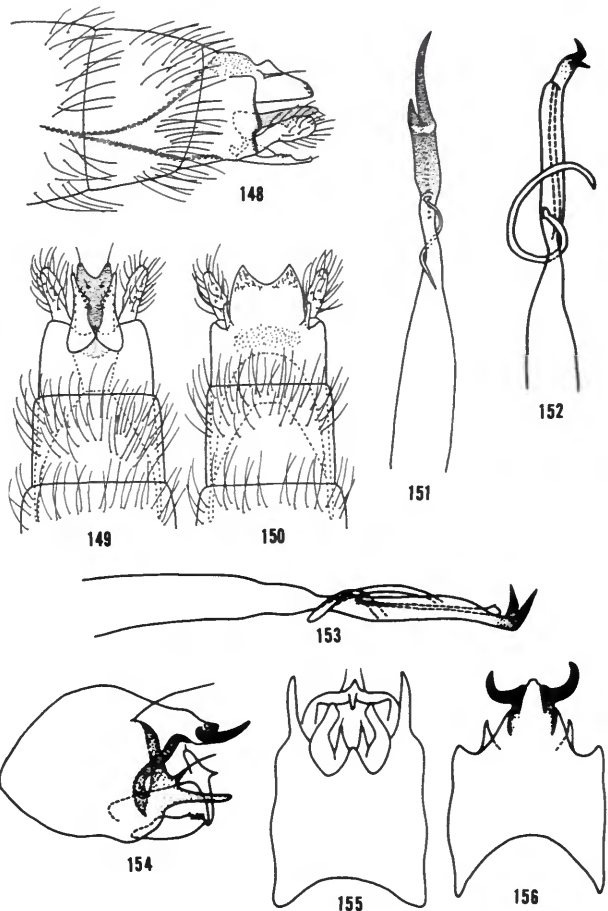
Key to Antioquian Subgenera of *Ochrotrichia*

- Foretibia with a apical spur *Metrichia*
- Foretibia lacking spurs *Ochrotrichia*

Subgenus *Ochrotrichia* Mosely

This exclusively New World subgenus is widely distributed from southern Canada south to northern South America and throughout the Greater and Lesser Antilles. From this region over 40 species are known (Denning and Blicke, 1972), and many more are undoubtedly to be discovered.

The immature stages live in silken, purse-like cases, often incorporating sand grains or small plant fragments, although a few species are known to construct cases formed more tortoise-shell-like (Wiggins, 1977, fig. 79c). Full descriptions of the larvae are found in Flint (1972), Ross (1944), and Wiggins (1977). The larval food appears to be mostly algal, often periphyton scraped from rocks (Vaillant, 1965). They generally live in streams, often small spring runs or dripping rock-faces, and even in streams that may dry up in the dry



FIGURES 148-156.—*Neotrichia colombiensis* Harris: 148, male genitalia, lateral; 149, same, ventral; 150, same, dorsal; 151, phallus, dorsal. *N. tauricornis* Malicky: 152, phallus, dorsal; 153, same, lateral; 154, male genitalia, lateral; 155, same, ventral; 156, same, dorsal.

season. The adults are attracted to light at night.

***Ochrotrichia* species**

Two females belonging to two unknown species of this subgenus were taken in Antioquia.

***Ochrotrichia* species A**

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 5 Jun 1983, U. Matthias, 1♀.

***Ochrotrichia* species B**

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada El Retiro, 16 km NW Medellín [road to San Pedro], 20 Feb 1984, C.M. & O.S. Flint, Jr., 1♀.

Subgenus *Metrichia* Ross

This subgenus is also exclusively New World in distribution, but more southerly, being found from the southwestern United States to central Chile and Argentina, including the West Indies. Over 30 species have been described in the subgenus.

The immature stages construct flattened, purse-like cases of

silk with admixed sand grains and plant fragments. The cases often have silken tubular extensions on the dorsal margin at the ends of the anterior and posterior slit-like openings (Botosaneanu and Flint, 1982). Nothing is known with certainty about the larval food, but probably they too feed on various algae. The adults are generally taken by net near springs, seeps, small spring-fed runs, and small streams.

Key to Antioquian Species of *Metrichia*

1. Clasper in lateral aspect distinctly longer than ninth segment; phallus with criss-cross internal pattern basad of paired spines *O. (M.) bola*, new species
Clasper generally shorter than, or rarely almost as long as, ninth segment; phallus with at most a simple, straight ejaculatory duct internally basad of the spines 2
2. Clasper in lateral aspect with a protruding, finger-like, black process subapically *O. (M.) protrudens*, new species
Clasper either rounded apically, or with apex pointed, or bearing a small apicomesal point 3
3. Clasper in lateral aspect tapering evenly from base to an attenuate, pointed apex *O. (M.) cuspidata*, new species
Clasper broad for at least half length, then rapidly narrowed to apex which may be produced into a small point 4
4. Phallus with its paired spines arising at half or less the distance from the origin of the ejaculatory duct to its apex 5
Phallus with its paired spines arising at least $\frac{3}{4}$ distance from origin of ejaculatory duct to apex 8
5. Phallus with a large, blunt process to one side of process bearing paired spines and ejaculatory duct *O. (M.) anisoscola*, new species
Phallus with only a tubular process bearing ejaculatory duct and paired spines . . 6
6. Paired spines of phallus arising close together on same side of phallus *O. (M.) sacculifera*, new species
Paired spines of phallus arising on opposite sides of phallus 7
7. Dorsolateral hook long, reaching nearly to apex of clasper, tip only slightly hooked *O. (M.) malada*, new species
Dorsolateral hook barely surpassing cercus, apical half sharply hooked ventrad *O. (M.) rona*, new species
8. Clasper in lateral aspect with apex bearing a point from near dorsal margin *O. (M.) lenophora*, new species
Clasper with apical point from ventral margin *O. (M.) macrophallata*, new species

Ochrotrichia (Metrichia) lenophora, new species

FIGURES 157, 158

The combination of long dorsolateral hooks, apicodorsal point on the clasper, and 2 spines displaced well toward the apex of the phallus, and abdomen bearing pouches between terga 5 and 6 and 6 and 7, readily distinguish this species from its congeners.

ADULT.—Length of forewing, 2–3 mm. Color fuscous; head with silvery hair frontally, mesonotum with lateral patches of

silver hair; forewing fuscous, with silver hair at anal angle, in an indistinct transverse band at midlength, in a small patch on posterior margin subapically and with a silver spot at apex. Male abdomen with elongate, lateral pouches in fifth segment opening between 5 and 6; sixth tergum darkened, with a small, pale, impressed spot posteromesally; with a pair of dark sacs between 6 and 7; seventh sternum with a small apicomesal point. *Male genitalia*: Ninth segment about twice as long as high in lateral aspect, with posterior margin slightly oblique. Cercus rounded, upright. Tenth tergum elongate, sclerotized

basally, membranous apicad. Dorsolateral hook, elongate, apex slightly curved mesad. Clasper longer than high, with a broad basoventral shelf, apical margin developed into a mesally directed point near dorsal margin. Phallus with 2 well-developed, subapical spines, one long, slender with no basal structure, the other shorter, attached to a basal sclerite; ejaculatory duct very long.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 10 km E Medellín [road to Guarne], 7 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 2♂, 1♀. Quebrada Bocana, 8 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada Espadera [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 3♂.

Ochrotrichia (Metrichia) malada, new species

FIGURES 159, 160

This species shows some relationship to *O. (M.) lenophora*, new species, but is readily distinguished by the spines being further from the apex of the phallus, and the apex of the clasper being only angulate but with an apicomeral, dark point.

ADULT.—Length of forewing, 2 mm. Color fuscous; front of head and mesonotum with silvery-gray hair; forewing fuscous, with ill-defined silvery marks. Male abdomen with elongate, reticulate pouches between segments 5 and 6; sixth tergum darkened, with a posteromesal, impressed, pale mark; seventh tergum a bit elongated, with anterior margin strongly sclerotized, delimiting a narrow slit-like opening beyond posterior margin of the sixth tergum with very small, lateral pockets in the slit. *Male genitalia*: Ninth segment about 3 times as long as high in lateral aspect, posterior margin sinuate. Cercus ovate. Tenth tergum elongate, basal half sclerotized, apical half membranous. Dorsolateral hook with apical quarter angled slightly laterad, ending in a small lateral point. Clasper elongate with apical margin developed into a slight angle at midheight, mesal face with a small, darkened point near this angle. Phallus with 2 well-developed subapical spines, each arising from a convoluted, strap-like sclerite; ejaculatory duct very distinct, arising at midlength of phallus.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 14 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Quebrada La Ayurá, Envigado (trap B), Apr-Jul 1983, U. Matthias, 23♂, 23♀. Quebrada La Cebolla, El Retiro (trap A), May-Aug 1983, U. Matthias, 5♂, 4♀.

Ochrotrichia (Metrichia) rona, new species

FIGURES 161, 162

The short, decurved dorsolateral hooks, short claspers with a protruding apicomeral angle, 2 large spines on the phallus, and especially the abdominal sacs between terga 4 and 5 and 5 and

6, readily distinguish this species.

ADULT.—Length of forewing, 2 mm. Color fuscous; front of head, legs, and thorax mostly with silver hair; forewings with large areas of silvery-gray hair. Male abdomen with a pair of large, round sacs filled with black, scale-like hairs between terga 4 and 5; a pair of very small sacs laterally between 5 and 6; dorsum densely covered with black hair. *Male genitalia*: Ninth segment about 2½ times as long as high in lateral aspect; posterior margin sinuate. Cercus small, elongate. Tenth tergum lightly sclerotized, hood-like. Dorsolateral hook with apex obliquely produced in dorsal aspect, sharply hooked ventrad in lateral aspect. Clasper longer than high, posterior margin produced into an angulate projection at midlength, and a small ventroapical angle. Phallus with 2 well developed, subapical hooks, with bases separated, each arising from a strap-like basal sclerite; apex sclerotized, flattened and convoluted; ejaculatory duct strongly sclerotized.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 7 km E San Jerónimo, 23 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 7♂. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 1♂.

Ochrotrichia (Metrichia) sacculifera, new species

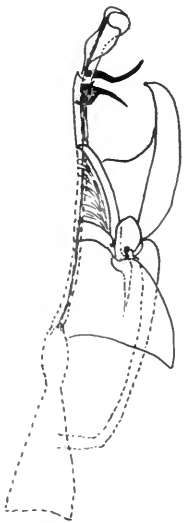
FIGURES 163, 164

This species bears decurved dorsolateral hooks, a broad clasper produced apicoventrally, two large spines on one side of the phallus that are borne near the base of the ejaculatory duct, and a pair of large pouches with bilobed posterior margins in the fifth segment. The presence of a patch of silvery, scale-like hairs on the center of the forewing is unique to the species.

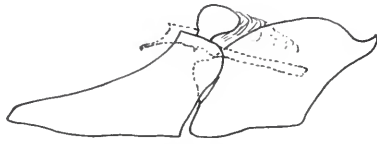
ADULT.—Length of forewing, 2 mm. Color fuscous; body with fuscous hairs; tip of antenna pale; forewing fuscous with a round, central patch of iridescent silver scales overlain by long black hairs from veins within the patch, with a very small, white spot at apex of wing and another subapically on posterior margin. Male abdomen with a pair of large, reticulate pouches whose posterior margins are deeply bilobed in fifth segment. *Male genitalia*: Ninth segment about twice as long as high in lateral aspect. Posterior margin produced dorsally. Cercus elongate. Tenth tergum mostly membranous. Dorsolateral hook with apical half angled ventrad. Clasper elongate, with a small apical point, ventral margin of mesal face with a cluster of short black setae. Phallus with 2 well developed spines arising just about 2/3 length of phallus and both on same side; ejaculatory duct dark, arising near midlength.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

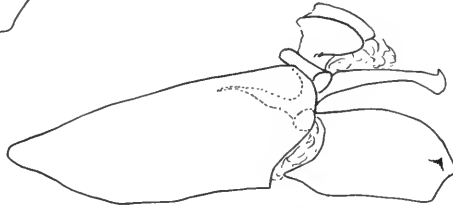
Paratype: Same data as holotype, 1♂.



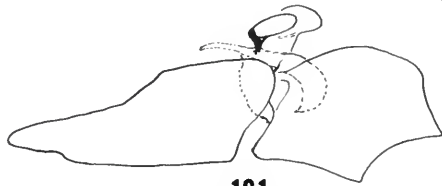
157



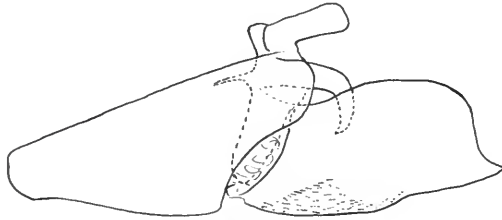
158



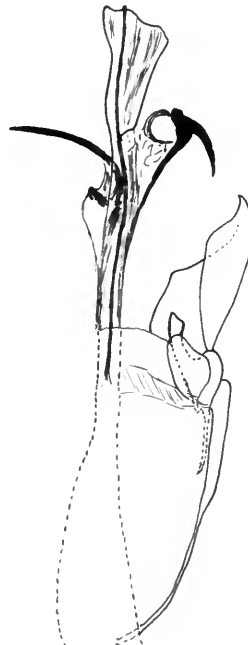
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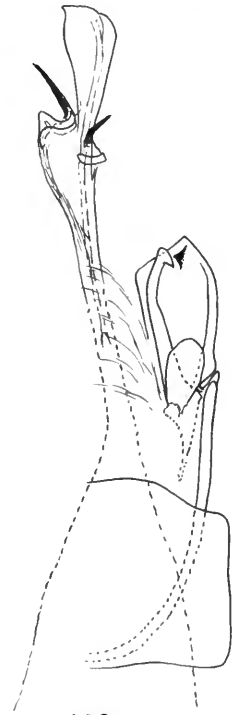
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163



162



160



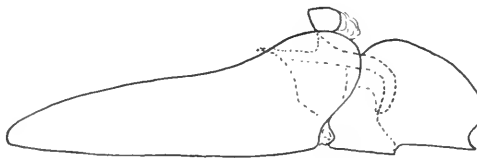
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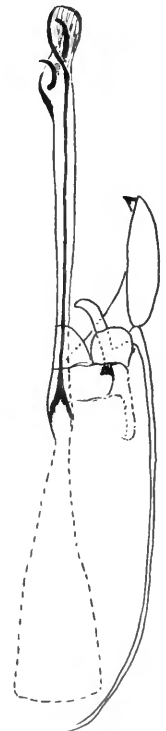
168



167



165



166

FIGURES 157–168.—*Ochrotrichia (Metrichia) lenophora*, new species: 157, male genitalia, dorsal; 158, same, lateral. *O. (M.) malada*, new species: 159, male genitalia, lateral; 160, same, dorsal. *O. (M.) rona*, new species: 161, male genitalia, lateral; 162, same, dorsal. *O. (M.) sacculifera*, new species: 163, male genitalia, lateral; 164, same, dorsal. *O. (M.) macrophallata*, new species: 165, male genitalia, lateral; 166, same, dorsal. *O. (M.) cuspidata*, new species: 167, male genitalia, lateral; 168, same, dorsal.

Ochrotrichia (Metrichia) macrophallata, new species

FIGURES 165, 166

This species is readily identified by the long phallus with a pair of small spines very near its apex, as well as the short clasper produced into a small apicoventral point. The abdomen bears a pair of sacs between segments 5 and 6, and a modification between segments 6 and 7. Both the fore and hindwings possess on their ventral surfaces patches of scale-like setae.

ADULT.—Length of forewing, 2 mm. Color fuscous; hair fuscous; forewing fuscous with a small white spot at apex and some white hairs in fringe along anterior and posterior margins; fore and hind wings on undersurfaces with an oval patch of scale-like setae. Male abdomen with a pair of small ovoid sacs between terga 5 and 6 (wholly everted in type), tergum 6 elongate and apparently bearing modified setae; between terga 6 and 7 a dark, transverse bar and a small round sac mesad of each end. *Male genitalia*: Ninth segment almost 4 times longer than high in lateral aspect; posterior margin sinuate. Cercus small, rounded. Tenth tergum lightly sclerotized basally, small. Dorsolateral hook short, apical half angled ventrad. Clasper slightly longer than high in lateral aspect, dorsal margin rounded, with an apicoventral point, with a mesobasal shoulder-like area. Phallus very long, with portion beyond origin of ejaculatory duct long and slender with lightly sclerotized walls, ejaculatory tube well sclerotized; with a pair of small subapical hooks, apex lightly sclerotized and convoluted.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Ochrotrichia (Metrichia) cuspidata, new species

FIGURES 167, 168

The claspers tapering to a sharp point and the very short decurved dorsolateral hook are distinctive. The abdomen bears sacs between segments 5 and 6, and has strongly modified terga 5, 6, and 7.

ADULT.—Length of forewing, 2.5 mm. Color fuscous, hair generally fuscous but some paler hair on face; forewing fuscous, apex with a small white spot and a small, white spot subapically on posterior margin. Male abdomen with a pair of large oval sacs between segments 5 and 6, apex of tergum 5 and all of 6 and basal half of 7 modified, bearing many short,

widened setae. *Male genitalia*: Ninth segment slightly more than three times as long as high in lateral aspect; posterior margin produced dorsally. Cercus small, rounded. Tenth tergum sclerotized basally, membranous apically. Dorsolateral hook short, apical half angled ventrad. Clasper $2/3$ as high as long in lateral aspect, produced into an apical point. Phallus with 2 well developed subapical spines whose origins are well separated and arising from a convoluted, straplike basal sclerite; ejaculatory duct well sclerotized, tip broken off (originally flattened and convoluted much as in *O. (M.) lenophora*).

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 10 km E Medellín [road to Las Palmas], 21 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Ochrotrichia (Metrichia) protrudens, new species

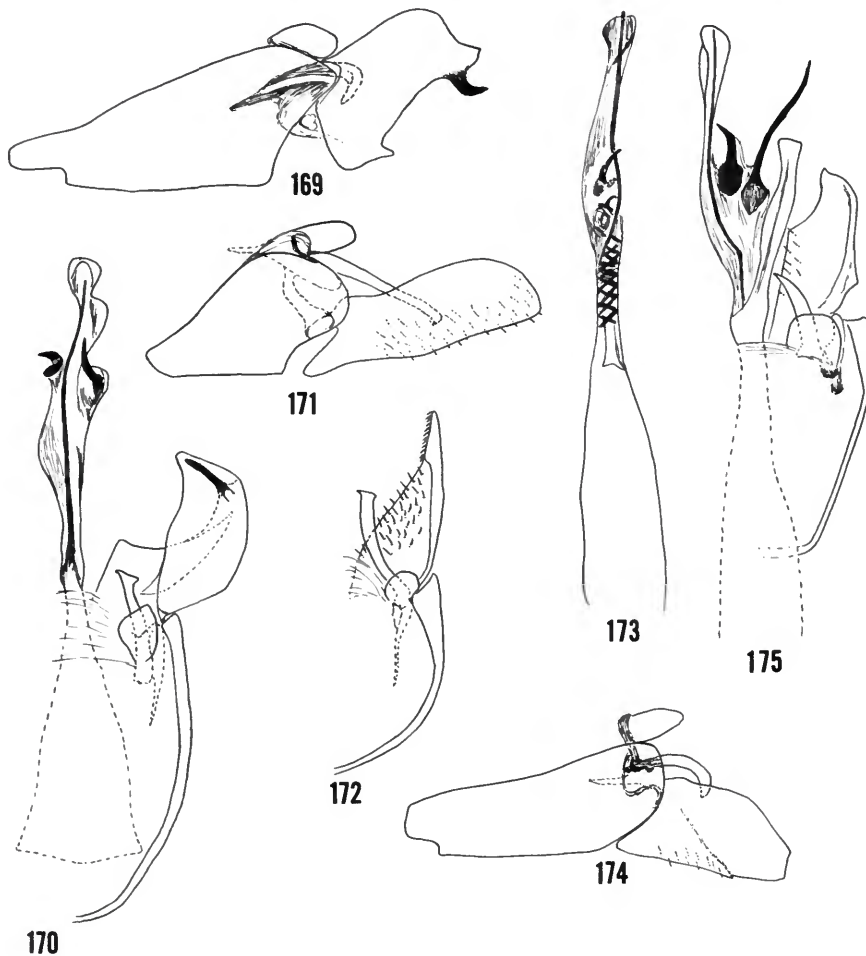
FIGURES 169, 170

The shape of the clasper, with its broad dorsal lobe and black processes from beneath the apex dorsally, is diagnostic. The modifications of the abdomen with sacs between 5 and 6 and odd structure between 6 and 7, with a highly modified tergum 5, and the large patch of scalelike setae on the underside of the hindwings, are also very distinctive.

ADULT.—Length of forewing, 2 mm. Color fuscous; body and forewing extensively and irregularly maculate with silvery hair; hindwing beneath with a large, oval, central area of flattened scale-like setae. Male abdomen with a pair of large, curled sacs exiting between segments 5 and 6, between terga 6 and 7 a transverse dark bar with a small round sac just mesad of each end; fifth tergum elongate, bearing on each side a row of long, flattened setae and an elongate concavity lined with small scale-like setae; terga 6 and 7 apparently bearing many short, flattened setae. *Male genitalia*: Ninth segment almost 3 times as long as high in lateral aspect; posterior margin produced and angulate subdorsally. Cercus small, obliquely subquadrate. Tenth tergum membranous. Dorsolateral hook with apex obliquely produced in dorsal aspect, sharply hooked ventrad in lateral aspect. Clasper with a large, overhanging dorsal lobe in dorsal aspect; in lateral aspect oblique in appearance, rounded dorsally, with a strong, dark tooth just beneath apex, rounded ventrally with a small point apically. Phallus with a pair of subapical hooks with bases at same level, apex enlarged, flattened and convoluted; ejaculatory duct well sclerotized.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km N Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Quebrada La Ayurá, above Envigado, 21 Feb 1984, C.M. & O.S. Flint, Jr., 21♂; same, but trap B, Apr 1983–Mar 1984, U. Matthias, 50♂, 95♀. Quebrada La Cebolla, El Retiro (trap A), 29 Sep 1983, U. Matthias, 1♂. Quebrada La Jiménez, Sopetrán (trap C), Jun 1983, U. Matthias, 1♀.



FIGURES 169–175.—*Ochrotrichia (Metrichia) protrudens*, new species: 169, male genitalia, lateral; 170, same, dorsal. *O. (M.) bola*, new species: 171, male genitalia, lateral; 172, same, dorsal; 173, phallus, lateral. *O. (M.) anisoscola*, new species: 174, male genitalia, lateral; 175, same, dorsal.

Ochrotrichia (Metrichia) bola, new species

FIGURES 171–173

The structure of the phallus is unique in this species: the strange, spirally-wound, internal process is unknown elsewhere in the genus. The long straight dorsolateral hooks, and long, almost parallelogram-shaped, clasper contribute to the distinctive appearance of the species. The male abdomen has sacs between segments 5 and 6 and a structure between 6 and 7.

ADULT.—Length of forewing, 2 mm. Color in alcohol, pale brown. Male abdomen with a pair of small sacs between terga 5 and 6; between terga 6 and 7 a transverse dark bar with a small round sac just mesad of each end. *Male genitalia*: Ninth segment about as high as long in lateral aspect, with posterior margin strongly sinuate. Cercus small, rounded in dorsal, but elongate in lateral aspect. Tenth tergum membranous. Dorsolateral hooks long, nearly straight, apex flared

slightly. Clasper elongate, more than 3 times as long as high in lateral aspect, mesal face with many black spines. Phallus with a pair of small black spines at about $\frac{2}{3}$ total length, with bases slightly separated and arising from same side of phallus, each spine with a sclerotized basal area; with a lateral, spirally-wound process apparently in a thin sheath basad of spines; apex flattened, trough-like; ejaculatory duct strongly sclerotized.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 28 Apr–5 Jun 1983, U. Matthias. USNM Type.

Paratypes: Same data as holotype, but May 1983–Apr 1984, 33♂, 155♀.

Ochrotrichia (Metrichia) anisoscola, new species

FIGURES 174, 175

The phallus in this species, with its stout lateral process and

2 very unequally developed spines, is different from that of any other known Colombian species. The dorsolateral hook is slightly decurved, and the clasper rather long, tapering toward a truncate apex. The male abdomen does not have any apparent modifications.

ADULT.—Length of forewing, 2 mm. Color in alcohol, pale brown. Male abdomen without modifications. *Male genitalia*: Ninth segment three times as long as high in lateral aspect, posterior margin broadly rounded. Cercus large, elongate in lateral aspect. Tenth tergum membranous. Dorsolateral hook short, decurved in lateral aspect. Clasper elongate, tapered apicad; apex truncate with small dorsal and ventral angles, with a distinct mesobasal shelf. Phallus with a pair of large spines, one much longer than the other, arising at about $\frac{2}{3}$ length from base; with a stout lateral process from near midlength; apex flattened and convoluted, with ejaculatory duct well sclerotized.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Ayurá, Envigado (trap B), 29 Mar 1983, U. Matthias. USNM Type.

Paratype: Same data as holotype, but 14 Apr 1983, 1♀.

Ochrotrichia (Metrichia) species

In addition to those species above described, females of three other species were taken in the emergence traps. They are not any of the species for which we have associated females. However, they might be the opposite sex of some of those species for which we have only males: *O. (M.) sacculifera*, new species, *O. (M.) macrophallata*, new species, *O. (M.) cuspidata*, new species, or *O. (M.) rona*, new species, or they may be species whose males are not yet known in the region.

Key to Antioquian Species of *Rhyacopsyche*

1. Genitalia with an elongate process bearing dark, apicomeral ridges arising between claspers and tenth tergum *R. matthiasi*, new species
Genitalia without a process in this region 2
2. Clasper vertical, with processes extending posteriad from dorsal and ventral margins *R. jimena*, new species
Clasper elongate, apex narrowed *R. andina*, new species

Rhyacopsyche jimena, new species

FIGURES 176-179

This species is closely related to *R. turrialbae* Flint from Costa Rica. It is to be distinguished by the differently shaped dorsolateral lobes of the ninth segment, the differently developed lobes of the claspers (especially the much longer basal lobes) and the quite differently formed subgenital plate.

ADULT.—Length of forewing, 3-3.5 mm. Color in alcohol, brown. Seventh sternum with a minute apicomeral point. *Male*

Ochrotrichia species D

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 1 Sept 1983, U. Matthias, 1♀.

Ochrotrichia species J

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), Jun 1983, 1♀.

Ochrotrichia species K

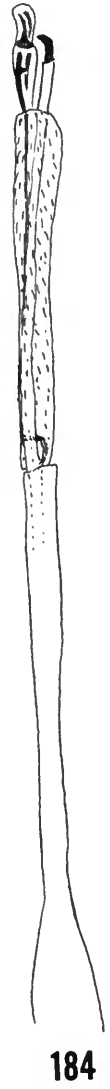
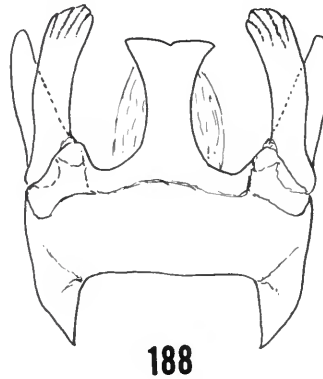
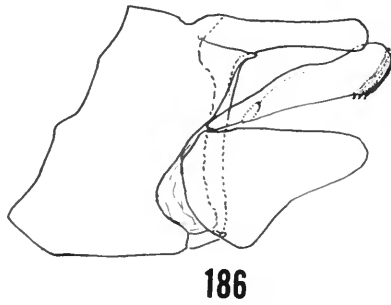
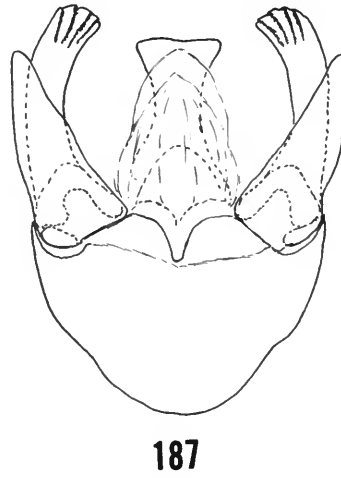
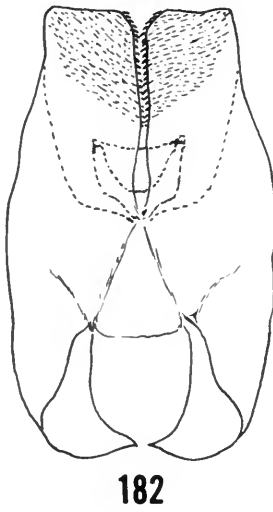
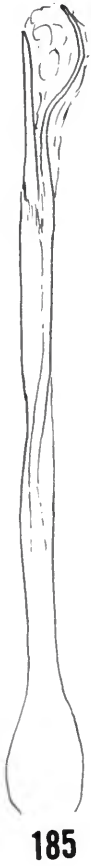
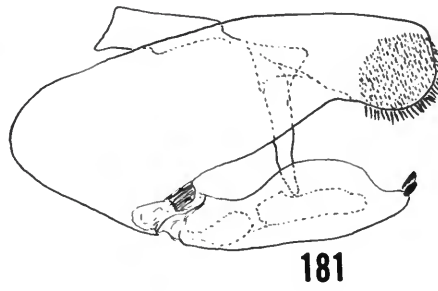
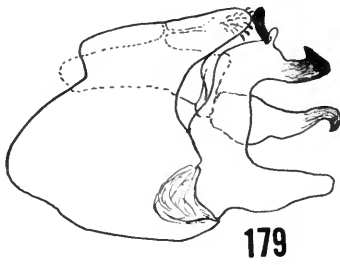
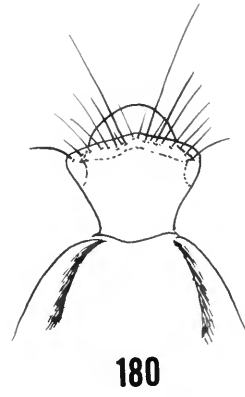
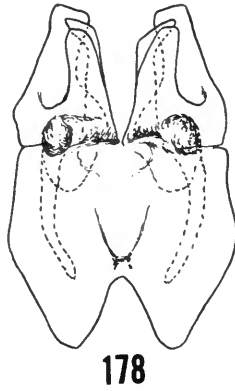
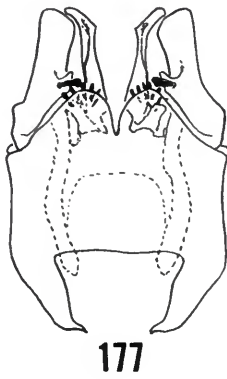
MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), Aug 1983, 1♀.

Genus *Rhyacopsyche* Müller

This genus is limited to mountainous regions of the Neotropics from Mexico south to Peru and in the mountains of southeastern Brazil. Three new species are here reported from Colombia, one in each of the two recognized species groups (Flint, 1971a), the third apparently requiring a group of its own. Thus, the number of known species in the genus increases to ten.

The cases of the larvae and pupae were the basis for the erection of *Rhyacopsyche* for a species from southeastern Brazil. Subsequently Thienemann (1905) described the larvae, pupae, and adults of this species. The larvae and cases of a Central American species were described by Flint (1971a). The larval cases are elongate and may be attached to the substrate by a silken thread, while the pupal cases are rigidly attached by a short stalk. They inhabit rocks in areas wet by spray from adjacent falls or cascades; the new records suggest they may also inhabit wet rocks in rapids in streams. Their food is unknown.

genitalia: Ninth segment inflated and slightly rounded anteriorly; dorsolateral lobe slightly produced, rounded apically with posterior face bearing short, black, peglike setae. Tenth tergum retracted within ninth tergum, with long basal processes, with strong lateral supports to subgenital plate. Subgenital plate large and strongly sclerotized, widely open dorsally and ventrally; apex narrowed, hooklike, and produced ventrad and laterad; basoventrally articulating with a lightly sclerotized sclerite lying between clasper bases. Clasper tall and narrow, developed into a long, apically rounded basal lobe,



FIGURES 176–188.—*Rhyacopsyche jimena*, new species: 176, phallus, dorsal; 177, male genitalia, dorsal; 178, same, ventral; 179, same, lateral. *R. andina*, new species: 180, female eighth tergum, dorsal; 181, male genitalia, lateral; 182, same, dorsal; 183, same, ventral; 184, phallus, dorsal. *R. matthiasi*, new species: 185, phallus, dorsal; 186, male genitalia, lateral; 187, same, ventral; 188, same, dorsal.

and a dorsal lobe bearing a leaflike seta on a small process and ending in a small dorsal hook. Phallus with basal half tubular and slightly inflated; apex tubular with a dark filament extending slightly beyond center of tube whose apex is obliquely truncate.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), 3 Aug 1983, U. Matthias. USNM Type.

Paratype: Same data as holotype, 1♂.

Rhyacopsyche andina, new species

FIGURES 180–184

This species is typical of the *mexicana* group, but not obviously closely related to any of the other species. The large lobate and heavily setate dorsolateral lobes of the ninth segment, and the lack of a pronounced apicodorsal lobe on the claspers, are suggestive of *R. torulosa* Flint, but quite different in detail. The phallus is of the same basic construction as in the other species, but unique in detail. The female eighth tergum is similar to those of *R. torulosa* or *R. mexicana* (Flint), but distinct in details of the relative shapes of the dorsal and ventral lobes.

ADULT.—Length of forewing, 5–5.5 mm. Color dark brown; antennae, facial hairs, and legs cream colored; lobes and hair of vertex dark brown; forewing with intermixed spots of cream colored and dark brown hairs, veins bearing erect hair. Seventh sternum with a distinct posteromesal keel. *Male genitalia*: Ninth segment produced and rounded anterolaterally; dorsolateral lobes rounded and produced apicoventrally in lateral aspect, truncate in dorsal; apicomesally with a very large patch of black, peglike setae. Tenth tergum with an internal, rectangular sclerite anteriorly; produced posteroventrally into a yoke-like sclerite articulating with subgenital plate between claspers, in ventral aspect plate is lyre-shaped. Clasper elongate, dorsal margin broadly enlarged at middle, apex with two black, erect, leaf-like setae. Phallus with basal half tubular, base slightly inflated; with a lateral lobe arising at midlength, ending in a complex, rather membranous tip; central tube with a curved, black apical spine; a membranous sheath covered with black spicules arising at midlength and enclosing both apical processes. *Female genitalia*: Eighth sternum unmodified, slightly bilobate. Eighth tergum with a pair of dark, divergent, sublateral bars; from posterior margin a mesal lobe,

broadened apicad, and bearing a row of setae from near posterior, from beneath this lobe a smaller semicircular lobe connected to ventral surface of dorsal lobe.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Agudelo, 2 km E El Retiro, 25 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 14♂, 9♀; same, but 8 Feb 1983, 1♂, 1♀. DPTO. VALLE DEL CAUCA: Río Felida, Municipio Cali, 1400 m, adults emerged 15 Apr 1986, A. Quintero, 3♂, 2♀.

Rhyacopsyche matthiasi, new species

FIGURES 185–188

This species possesses rather unusual male genitalia that are difficult to homologize with those of the other species in the genus. The structures of the head, thorax and appendages, however, are clearly those of the genus. The single dorsal process, the articulated midlateral appendage with its apical black ridges, the trangular claspers and rather simple phallus, are all unique to this species.

ADULT.—Length of forewing, 3.5 mm. Color in alcohol, pale brown. Seventh sternum with a small, midventral keel. *Male genitalia*: Ninth segment annular, widest ventrally. Middorsally with an elongate sclerite, widened apicad. With a pair of midlateral, strap-like appendages, each with 4 small, black ridges on their inner face apically. Claspers elongate, widened basoventrally. Posterior surface of genital capsule with flat, ribbon-like sclerites extending, mesad of lateral appendages, from dorsolateral angles to venter, where apex appears to articulate with a lightly sclerotized ventromesal plate. Phallus slightly inflated at base, with an indistinct internal tubule; apex with a pointed spine to one side, and a hooked tubule to the other, with the latter in a membranous sac.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Urrao, 2000–2500 m, 18 Mar 1984, U. Matthias. USNM Type.

Family HYDROPSYCHIDAE

The Hydropsychidae are found in all biogeographic realms of the world, but are most diverse in temperate and tropical regions. Five genera are here recorded from the Department of Antioquia, although several more probably occur in the lowland areas which were not well sampled in this survey. The genus *Smicridea* belongs to the subfamily Hydropsychinae, all the other genera to the subfamily Macronematinae. The larvae are all inhabitants of flowing waters, or rarely, wave-washed shores of lakes. They construct rather complex, attached retreats with attached nets by which they seine their food from the passing water.

Key to Antioquian Genera of Hydropsychidae

1. Antenna about length of forewing; size smaller, forewing rarely attaining 10 mm *Smicridea*
 Antenna several times as long as forewing whose length is generally over 10 mm 2
2. Maxillary palpus with second segment longer than third *Leptonema*
 Maxillary palpus with third segment longer than second 3
3. Foretibia with an apical process extending hoodlike over basal tarsal segment *Centromacronema*
 Foretibia without any such apical process 4
4. Forewing with basal $\frac{2}{3}$ covered by green scales, apical $\frac{1}{3}$ with silver, brown and golden scales, all coloring due primarily to the scale covering . . . *Macronema*
 Forewing dark with pale markings, all in the membrane, without a colorful scale covering *Macrostemum*

Genus *Smicridea* McLachlan

I recognize two subgenera in *Smicridea*, the typical and *Rhyacophylax* (Flint, 1974b). Although very close relatives to both subgenera occur in Australia, these two are limited to the New World and are well represented in Antioquia.

Key to Antioquian Subgenera of *Smicridea*

- Hindwing with R_{2+3} and R_{4+5} parallel for a considerable distance, with r present (although rather weak), radiomedial system well separated from Cu_1 *Smicridea*
 Hindwing with R_{4+5} separating from R_{2+3} at a wide angle, no r , and with basal portion of radiomedial system approximate to Cu_1 *Rhyacophylax*

Subgenus *Smicridea* McLachlan

Species of this subgenus are found commonly from the southwestern United States to southern Chile, including both the Greater and Lesser Antilles. Over 75 species have already been described from this region and many more await description.

The immature stages are well known (Flint, 1974b, 1989;

Wiggins, 1977) and construct fixed retreats. There is an enclosed living portion of the retreat attached to or often hidden in a crevice in a rock or stick, in front of which is constructed a net of silk. The net serves to strain the larval food from the water flowing through it. The larval food is probably mostly detrital, but undoubtedly small organisms will be eagerly ingested when they are trapped by the net.

Key to Antioquian Species of *Smicridea*

1. Phallus in lateral aspect as high as long, almost circular in outline, or apically with long lateral or ventral appendages 2
 Phallus with a long, slender, tubular portion with various ornamentations at the apex 3
2. Phallus almost circular in outline, without long processes *S. (S.) polyfasciata* Martynov
 Phallus with a long, mesally-divided appendage from the posteroventral margin *S. (S.) nigripennis* Banks
3. Apical segment of the clasper distinctly angled from basal portion of segment in dorsal aspect and with apex distinctly bifid *S. (S.) bivittata* (Hagen)
 Apical segment of clasper not so angled, tip pointed or bluntly rounded 4
4. Apex of phallus with distinct lateral plates, rounded basally and usually apically;

- tenth tergum elongate in lateral aspect with apex upturned 5
- Apex of phallus either without noticeable lateral plates, or they are elongate, indistinct basally and pointed apically; tenth tergum variously formed, often with lateroventral lobes, apex rounded or pointed, never upturned 8
- 5. Abdomen with internal pheromone sac longer than the segment in which it lies . 6
- Pheromone sac much shorter than its segment or lacking 7
- 6. Phallus with an angle at midlength, apicolateral plate with a distinct, dorsomesal tooth *S. (S.) grandisacatta*, new species
- Phallus straight at midlength, apicolateral plate rounded apically
- *S. (S.) nigricans*, new species
- 7. Apical segment of clasper tapering to a point in dorsal aspect
- *S. (S.) curvipenis*, new species
- Apical segment of clasper blunt *S. (S.) microsaccata*, new species
- 8. Phallus terminating in a distinct, ventromesal lobe beneath dark, pointed lateral plates 9
- Phallus without a mesoventral lobe, lateral plates may be lacking 11
- 9. Tenth tergum with a setate angle ventrolaterally, not distinct in dorsal aspect
- *S. (S.) conjuncta*, new species
- Tenth tergum with an elongate ventrolateral lobe, clearly visible as a separate lobe in dorsal aspect 10
- 10. Apical segment of clasper in dorsal aspect enlarged subapically, terminating in two, small points; basal segment of clasper with a small, mesal appendage subbasally
- *S. (S.) ruginasa*, new species
- Apical segment of clasper tapering evenly to a narrowly-rounded tip; no appendage mesally from basal clasper segment *S. (S.) prorigera*, new species
- 11. Tenth tergum in lateral aspect tapering to an apical point; phallus with dorsolateral, pointed processes *S. (S.) breviuncata* Flint
- Tenth tergum broadly rounded in lateral aspect; phallus lacking elongate processes
- *S. (S.) urra*, new species

Smicridea (Smicridea) bivittata (Hagen)

FIGURES 189-192

Hydropsyche bivittata Hagen, 1861:291.

Smicridea bivittata (Hagen).—Fischer, 1963:131; 1972a:144.—Flint, 1974b:16-17; 1981a:22.

This is a common, widespread species known from Mexico south to Colombia, and east to Surinam, and I have seen examples from Ecuador. It was taken near Sopetrán, the lowest, driest site sampled, and has also been taken in the Departments of Chocó, Risaralda, and Valle del Cauca in Colombia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), May 1983–Mar 1984, U. Matthias, 7♂, 14♀. “Finca Velásquez,” Sopetrán, 14 Feb 1983, O.S. Flint, Jr., 1♀.

Smicridea (Smicridea) urra, new species

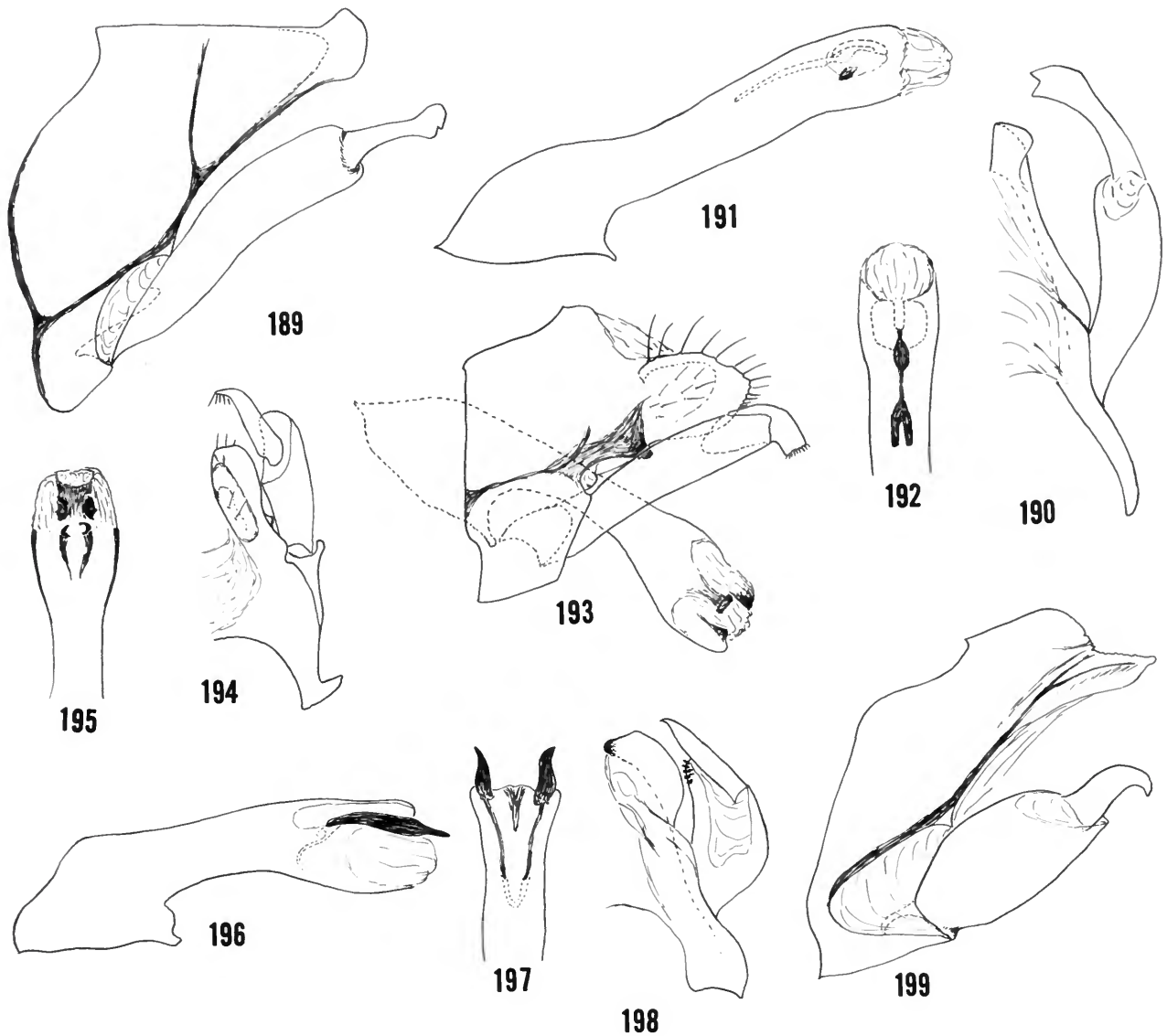
FIGURES 193-195

This seems to be the most primitive member of the line leading to *S. (S.) breviuncata* Flint, *S. (S.) conjuncta*, new species, and beyond to *S. (S.) ruginasa*, new species, etc. The elongate basal clasper segment, being widespread in the genus,

would seem to be quite primitive, yet the apical segment is already modified as in many of the more advanced species. The membranous, lightly sclerotized process of the apex of the phallus appears to be placed as in the more advanced species where they are fully sclerotized. However, the tenth tergum is strongly modified and very distinctive.

ADULT.—Length of forewing, 5 mm. Color in alcohol, uniformly brown. Male abdomen with 2 pairs of large internal sacs, each about 1½ times as long as its segment. *Male genitalia*: Ninth segment with a strong dorsolateral angle; with ventrolateral area expanded laterad, providing a broad lateral base for claspers. Tenth tergites strongly sclerotized, widely and deeply separated in dorsal aspect; in lateral aspect broad, rounded apicad, with a dark ventrolateral lobe. Clasper with basal segment elongate, nearly parallel-sided; apical segment sharply angled mesad, tip pointed. Phallus tubular, angled from base; apex slightly inflated, mostly membranous, with a pair of dorsolateral lobes lightly sclerotized apically, a ventral, lip-like lobe lightly sclerotized dorsomesally; internal sclerite caliper-like in dorsal aspect with apicolateral points strongly sclerotized.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Urrao, 2000–2500 m, 18 Mar 1984, U. Matthias. USNM Type.



FIGURES 189–199.—*Smicridea (Smicridea) bivittata* (Hagen): 189, male genitalia, lateral; 190, same, dorsal; 191, phallus, lateral; 192, tip of phallus, dorsal. *S. (S.) urra*, new species: 193, male genitalia, lateral; 194, same, dorsal; 195, tip of phallus, dorsal. *S. (S.) breviuncata* Flint: 196, phallus, lateral; 197, tip of phallus, dorsal; 198, male genitalia, dorsal; 199, same, lateral.

Smicridea (Smicridea) breviuncata Flint

FIGURES 196–199

Smicridea (S.) breviuncata Flint, 1974b:18.—Flint and Denning, 1989a:419.

This species has been known previously from Costa Rica and Panama. The Colombian examples from the Department of Chocó appear to agree with the Central American material (here figured) in all respects. Those examples from Antioquia

differ in several ways: the tip of the tenth tergum in dorsal aspect is more rounded and broader, the segments of the clasper appear a bit longer proportionately, and the apex of the basal segment lacks the small cluster of peglike setae mesally. Except for the lack of setae, these all appear to be quantitative differences and the phallus is identical in all examples. For these reasons I believe all examples are one, rather variable, species.

MATERIAL.—COLOMBIA. DPTO. CHOCÓ: km 130, 86 km

E Quibdó, 17 Feb 1983, O.S. Flint, Jr., 3♂. DPTO. ANTIOQUIA: 12 km N Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr., 5♂, 3♀.

Smicridea (Smicridea) conjuncta, new species

FIGURES 200–202

This species appears to link *S. (S.) brevuncata* Flint to the two following new species, *S. (S.) prorigera* and *S. (S.) ruginasa*. It is like *S. (S.) breviuncata* in lacking the ventrolateral hook from the tenth tergite, but does have a slight development of the ventral margin in the area of the hook. It has a short, broad clasper similar to all these species with no other modifications. The tip of the phallus still clearly shows the same sclerites as do *S. (S.) prorigera* and *S. (S.) ruginasa*: the strong dorsolateral sclerites, the mesoventral area, dorsal lobe developed and lightly sclerotized, as well as internal sclerotization. In *S. (S.) brevuncata* only the dorsolateral sclerites are well developed; all other parts are membranous and unrecognizable.

ADULT.—Length of forewing, 6 mm. Color grayish-fuscous, front of head with paler hair; forewing grayish-fuscous, apical fringe with paler hair. Male abdomen with internal sacs, each slightly longer than its segment. *Male genitalia*: Ninth segment slightly sinuous, and a bit oblique anteriorly. Tenth tergite elongate, narrow in lateral aspect, with ventrolateral margin slightly produced; in dorsal aspect with lobes rounded, darkened mesally. Clasper short; basal segment broad, with scattered, long, large setae; apical segment curved mesad, tapering to a blunt point. Phallus tubular, apex inflated; with a pair of elongate dorsolateral sclerites; apicoventral surface enlarged and produced, with dorsal margin narrowly produced; internal sclerites complex.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Iguaná, 17 km NW Medellín [road to San Jerónimo], 14–15 Feb 1983, O.S. Flint, Jr. USNM Type.

Smicridea (Smicridea) prorigera, new species

FIGURES 203–205

This and *S. (S.) ruginasa*, new species, are very closely related. The lack of the digitiform process on basal clasper segment, the narrowly pointed ventral process of the tenth tergum, and pointed apical clasper segment of *S. (S.) prorigera* are distinctive.

ADULT.—Length of forewing 5.5–6 mm. Color fuscous; forewing fuscous with 2 pairs of white spots (the remnants of the typical two cross-bands). Male abdomen with 2 pairs of large internal sacs, each 1½ times as long as its segment. *Male genitalia*: Ninth segment nearly vertical anteriorly. Tenth tergite short, upturned, rounded dorsally, with a ventrolateral projection, pointed in lateral aspect; apex drawn out into a mesally directed hook in dorsal aspect. Clasper short; basal

segment broad, with scattered, long, large setae; apical segment pointed and curved mesoventrad in both lateral and dorsal aspects. Phallus tubular, apex inflated; with a pair of elongate dorsolateral sclerites, mesoventrally produced into a narrow process beneath tip, with complex internal sclerites.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, Fizebad [W La Fé], 2150 m, 21 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 1♀; same, but trap A, May 1983–Apr 1984, U. Matthias, 503♂, 711♀. Quebrada La Ayurá, Envigado (trap B), Apr 1983–Mar 1984, U. Matthias, 39♂, 66♀. DPTO. CHOCÓ: km 114, E El Siete, 17 Feb 1983, O.S. Flint, Jr., 1♂, 10♀.

Smicridea (Smicridea) ruginasa, new species

FIGURES 206–209

This species is very closely related to the preceding species, *S. (S.) prorigera*, new species. In *S. (S.) ruginosa* the ventral process of the tenth tergum is paddle-shaped in dorsal aspect, the basal clasper segment bears a small, mesal digitiform process, and the apical clasper segment is very broad apically in dorsal aspect.

ADULT.—Length of forewing, 5 mm. Color fuscous; forewing fuscous with 2 transverse bands each broken into 2 spots, one on anterior margin, the other near posterior. Male abdomen with 2 pairs of large pheromone sacs, each 1½ times longer than its segment. *Male genitalia*: Ninth segment nearly vertical anteriorly. Tenth tergite short, upturned, rounded dorsally, with a ventrolateral projection, pointed in lateral aspect, paddle-shaped in dorsal aspect. Clasper short; basal segment broad, with scattered, long, large setae, mesal margin near base with a small digitiform process; apical segment broad, pointed and curved mesoventrad in lateral aspect, in dorsal aspect broadened apicad with apex produced into 2 small points from one of which runs a low dorsal carina. Phallus tubular, apex inflated; with a pair of dorsolateral sclerites; mesoventrally produced beneath tip; with complex internal sclerites.

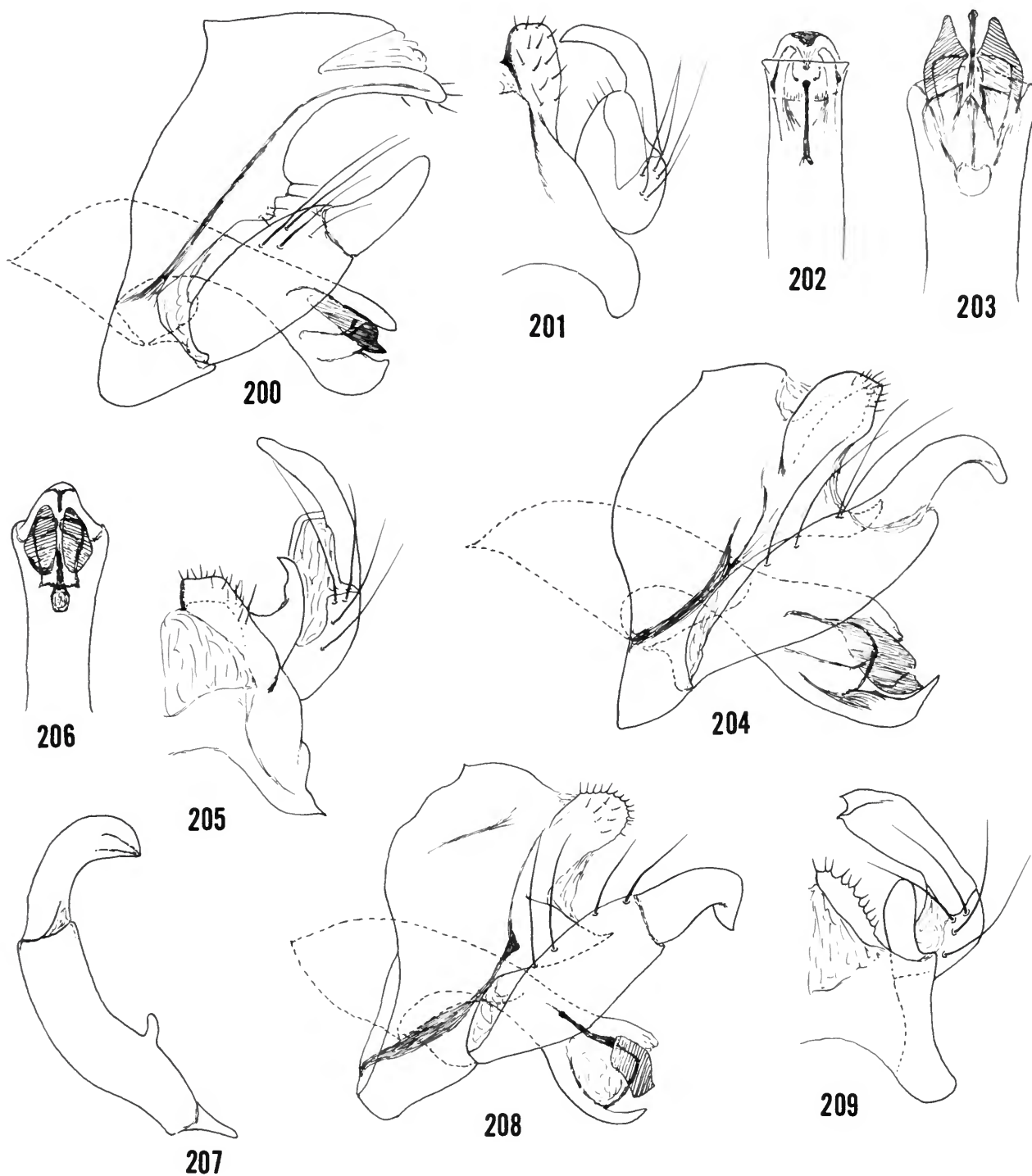
MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 11♂, 2♀.

Smicridea (Smicridea) curvipenis, new species

FIGURES 210–212

This species, *S. (S.) microsaccata*, new species, and *S. (S.) gransdisaccata*, new species, are all closely related on the basis of the presence of apicolateral plates on the phallus. In *S. (S.) curvipenis* the phallus is sharply angled, but in the other two only gently curved. The apex of the tenth tergum is not upturned in *S. (S.) curvipenis*, but is apically upturned in the



FIGURES 200–209.—*Smicridea* (*Smicridea*) *conjuncta*, new species: 200, male genitalia, lateral; 201, same, dorsal; 202, tip of phallus, dorsal. *S. (S.) proriga*, new species: 203, tip of phallus, dorsal; 204, male genitalia, lateral; 205, same, dorsal. *S. (S.) ruginasa*, new species: 206, tip of phallus, dorsal; 207, clasper, posteroventral; 208, male genitalia, lateral; 209, same, dorsal.

others. The tip of the apical clasper segment is bluntly pointed in *S. (S.) curvipenis* and *S. (S.) grandisaccata*, but blunt in *S. (S.) microsaccata*. The internal pheromone sacs differ in all three, being minute with the anterior pair lost in *S. (S.) microsaccata*, to about a third of the length of their segment in *S. (S.) curvipenis*, and finally, almost twice as large as their segment in *S. (S.) grandisaccata*. The Ecuadorian paratype agrees exactly, including the size of the pheromone sacs, with the Colombian material. I have in addition, a series from east central Peru whose genitalia are absolutely inseparable from those of the type, yet whose pheromone sacs are virtually as long as the segments in which they lie; I am considering at this time that this probably represents a distinct species.

ADULT.—Length of forewing, 6–7.5 mm. Color fuscous; forewing fuscous, with apical band reduced to scattered small pale hairs. Male abdomen with 2 pairs of very small internal sacs, each sac about $\frac{1}{3}$ length of its segment. **Male genitalia:** Ninth segment with anterior margin slightly produced laterally. Tenth tergite elongate, tip expanded in lateral view, produced and slightly enlarged basad in dorsal aspect. Clasper long, parallel-sided, basal segment surpassing tip of tenth tergite; apical segment terete, tapering to a bluntly pointed apex. Phallus tubular, long; phallosome with a distinct angle at about $\frac{2}{3}$ length; apex with mesally sclerotized ventral and dorsal lips, with a large, ovoid, lateral plate which is displaced laterad as seen in dorsal aspect.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km NW Medellín [road to San Pedro], 13 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 1♂; same, but 20 Feb 1984, C.M. & O.S. Flint, Jr., 4♂, 1♀. 24 km NW Medellín [road to San Jerónimo], 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♀. Cocorná, Jul 1980, A.M. del Corral, 1♂ (UNCM). ECUADOR. PCIA. NAPO: 4 km W Papallacta, 18 Jan 1978, W.N. Mathis, 1♂.

Smicridea (Smicridea) microsaccata, new species

FIGURES 213–216

This species is perhaps most closely related to *S. (S.) curvipenis*, new species, on the basis of reduction in size of the abdominal pheromone sacs. The terminal pair are half the size of those of *S. (S.) curvipenis*, but the anterior pair are wholly lost. In addition the tenth tergum is upturned apically, more like that of *S. (S.) grandisaccata*, new species, but the broad tip of the apical clasper segment is unique to *S. (S.) microsaccata*.

ADULT.—Length of forewing, 9 mm. Color in alcohol, uniformly dark brown. Male abdomen with a pair of minute and easily overlooked pheromone sacs between segments 7 and 8; lacking anteromost pair of sacs. **Male genitalia:** Ninth segment with anterior margin slightly and broadly produced centrally. Tenth tergum produced dorsad basally; tergite

elongate, tip slightly upturned in lateral aspect; apex produced in dorsal aspect. Clasper long, parallel-sided, basal segment surpassing tip of tenth tergite; apical segment short, tip truncate in posteroventral aspect. Phallus tubular, long, phallosome slightly curved; apex with lightly sclerotized, mesal surfaces dorsally and ventrally, with a large, ovoid, lateral plate which is displaced laterad as seen in dorsal aspect.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Urao, 2000–2500 m, 18 Mar 1984, U. Matthias. USNM Type.

Paratype: Same data as holotype, 1♂.

Smicridea (Smicridea) grandisaccata, new species

FIGURES 217–219

As noted above, this species, *S. (S.) curvipenis*, new species, and *S. (S.) microsaccata*, new species, are all closely related. The pheromone producing sacs of *S. (S.) grandisaccata* are very large, almost twice as large as their segments, rather than being much smaller than their segments as in the other species. Other small differences are to be seen in the tip of the tenth tergite, tip of the apical segment of the clasper, and shape of the phallus, especially the lateral plate which bears a small apicodorsal point.

ADULT.—Length of forewing 6–7 mm. Color uniformly fuscous. Male abdomen with 2 pairs of very large internal sacs, each almost twice as long as its segment. **Male genitalia:** Ninth segment with anterior margin slightly produced laterally. Tenth tergite elongate, tip upturned in lateral aspect, apex produced in dorsal aspect. Clasper long, slightly inflated apicad, basal segment slightly surpassing tip of tenth tergite; apical segment terete, tapering to a bluntly pointed apex. Phallus tubular, long, phallosome with a distinct angle at about midlength; apex with mesally sclerotized, ventral and dorsal lips; with a large lateral plate, which in lateral aspect is apically truncate with a small dorsal point, and is displaced laterad in dorsal aspect.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Agua Mala, 35 km NW Medellín [road to San Jerónimo], 14 Feb 1983, O.S. Flint, Jr. USNM Type.

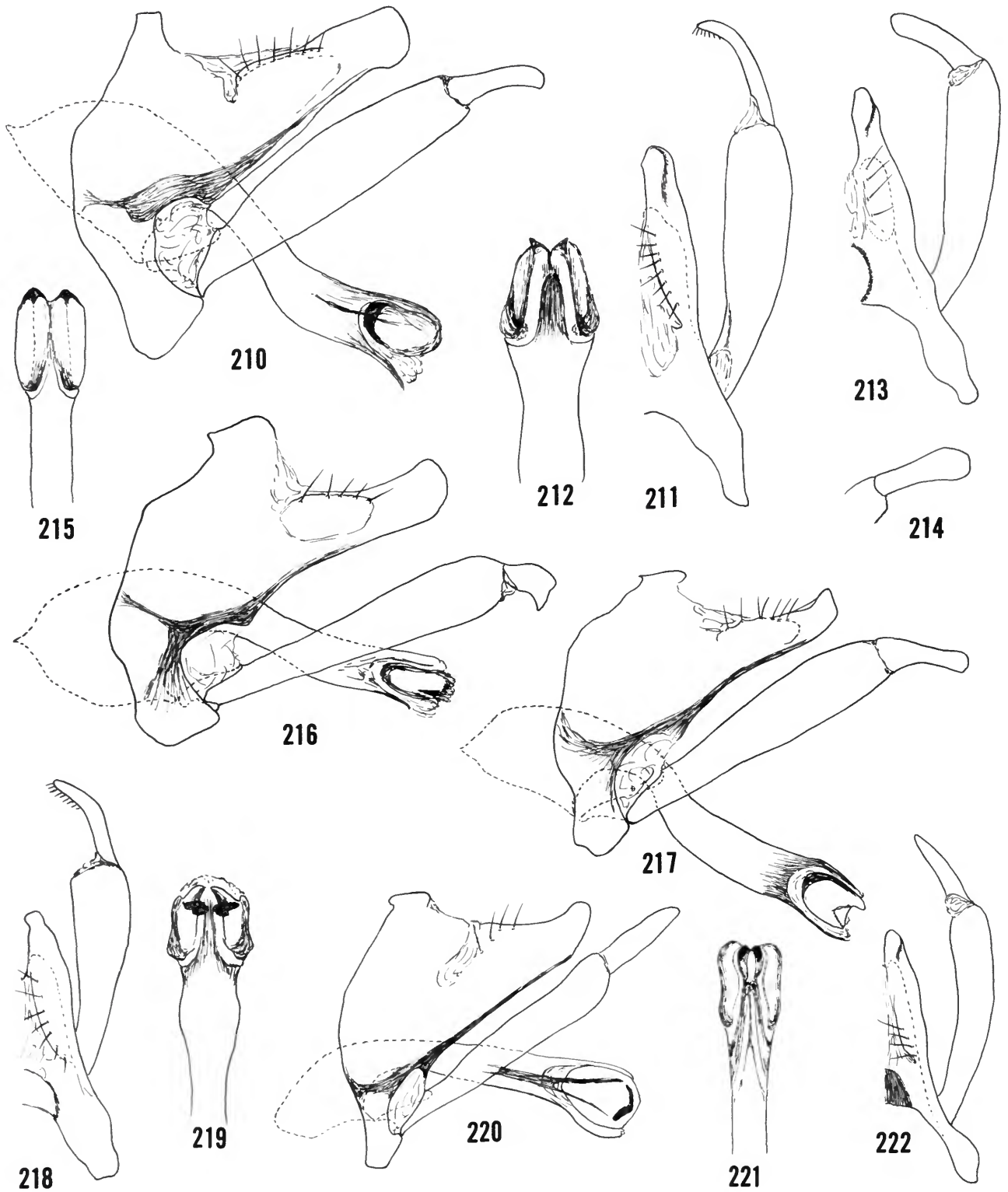
Paratypes: Same data as holotype, 5♂.

Smicridea (Smicridea) nigricans, new species

FIGURES 220–222

This is another species closely related to *S. (S.) curvipenis*, new species, and *S. (S.) grandisaccata*, new species, by the derived character of the presence of apicolateral plates on the phallus. From the latter species it may be recognized by its smaller size, and the structure of the phallus which is straight and bears differently formed internal sclerites.

ADULT.—Length of forewing, 3.5 mm. Color uniformly fuscous, forewing uniformly fuscous, with apical third angled



FIGURES 210–222.—*Smicridea (Smicridea) curvipenis*, new species: 210, male genitalia, lateral; 211, same, dorsal; 212, tip of phallus, dorsal. *S. (S.) microsaccata*, new species: 213, male genitalia, dorsal; 214, tip of clasper, posteroventral; 215, tip of phallus, dorsal; 216, male genitalia, lateral. *S. (S.) grandisaccata*, new species: 217, male genitalia, lateral; 218, same, dorsal; 219, tip of phallus, dorsal. *S. (S.) nigricans*, new species: 220, male genitalia, lateral; 221, tip of phallus, dorsal; 222, male genitalia, dorsal.

sharply mesad. Male abdomen with 2 pairs of very large internal sacs, each 1–1½ times length of its segment. *Male genitalia*: Ninth segment with anterior margin slightly convex. Tenth tergite elongate, tip upturned in lateral aspect, tapering regularly to a narrow apex in dorsal aspect. Clasper with basal segment long, parallel-sided, barely attaining apex of tenth tergum; apical segment straight, tapering to a blunt point. Phallus long, slender, phallosome straight, enlarged slightly apicad; apex with mesally sclerotized ventral and dorsal lips, with a large, ovoid lateral plate, displaced laterad as seen in dorsal aspect; internal sclerite long, slender, apical section curved ventrad and divided into right and left rami as seen in dorsal aspect.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 7 km E San Jerónimo [road to Medellín], 23 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 19♂, 5♀. Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 14 Feb 1983, O.S. Flint, Jr., 1♂, 1♀. DPTO. NARIÑO: 3 km N La Florida, 7,000' [–2,100 m], 15 Jan 1963, H.B. Cunningham, 1♂ (INHS). ECUADOR. PCIA. TUNGURUHA: Baños, 5900 ft [–1800 m], 28 May 1975, Cohen and Langley, 18♂, 2♀; same, but 13 km E Baños, 5300 ft [–1600 m], 23 Jan 1976, Spangler et al., 2♀.

Smicridea (Smicridea) polyfasciata Martynov

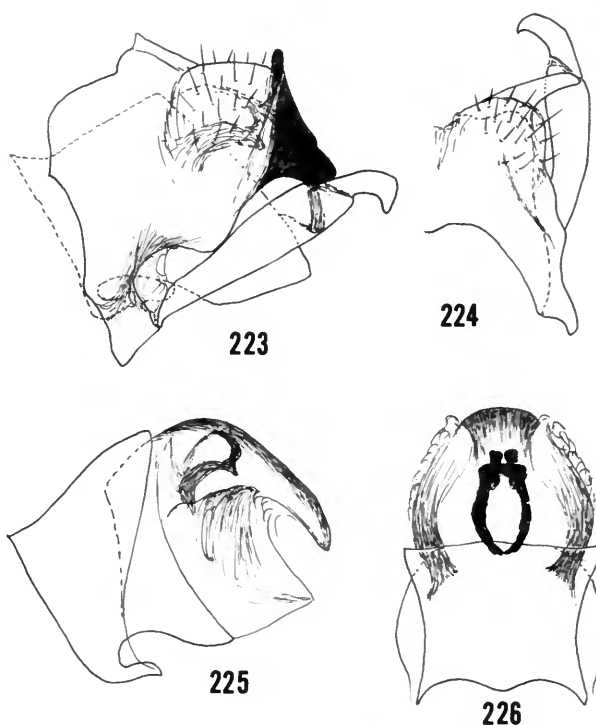
FIGURES 223–226

Smicridea polyfasciata Martynov, 1912:22–24.—Fischer, 1963:134.

This is one of the most unusual species of the genus yet found. The short, fat phallus and apical sclerites of the tenth tergum are most unusual. Martynov described *S. polyfasciata* from Peru and his drawings are wholly compatible with those here given. Recently, I collected a series of this species near Pilcopata in Peru, and, although from a site a few hundred kilometers from the type locality, it convinces me that the species has been rediscovered. There are more examples in the National Museum of Natural History from several localities in Ecuador and Bolivia; thus, the species seems to be wide ranging along the Andes from central Colombia to northern Bolivia, at least.

Because no modern figures of the cleared genitalia exist, I fully redescribe the species here. The figures of Martynov are quite good, but they are a bit schematic and are in a journal not widely available.

ADULT.—Length of forewing, 6–7 mm. Color fuscous, appendages paler; forewing fuscous with an incomplete whitish band from stigma in the Colombian examples, the other material appears to lack these hairs, with 3 areas toward



FIGURES 223–226.—*Smicridea (Smicridea) polyfasciata* Martynov: 223, male genitalia, lateral; 224, same, dorsal; 225, phallus, lateral; 226, same, dorsal.

anterior of wing devoid of hair: one subbasally, second just before middle, third over chord and interrupting whitish band; costal and subcostal cells for basal half of wing also hairless. Male abdomen with 2 pairs of very large internal sacs, each nearly 1½ times length of their segments. *Male genitalia*: Ninth segment rather irregular in outline. Tenth tergum short, very broad; tergite consisting of a rounded basal portion with setal wart, apically with a dark, heavily sclerotized lobe which in dorsal aspect shows its apex to be flared laterad. Clasper elongate; basal segment barely attaining apex of tenth tergum, slightly inflated apicad; apical segment short, hooked mesad. Phallus very short, basal portion very broad and high, completely filling genital capsule internally; apex with a broad, thin dorsal lip closing apex except for ventral opening, with a dark internal sclerite dorsally.

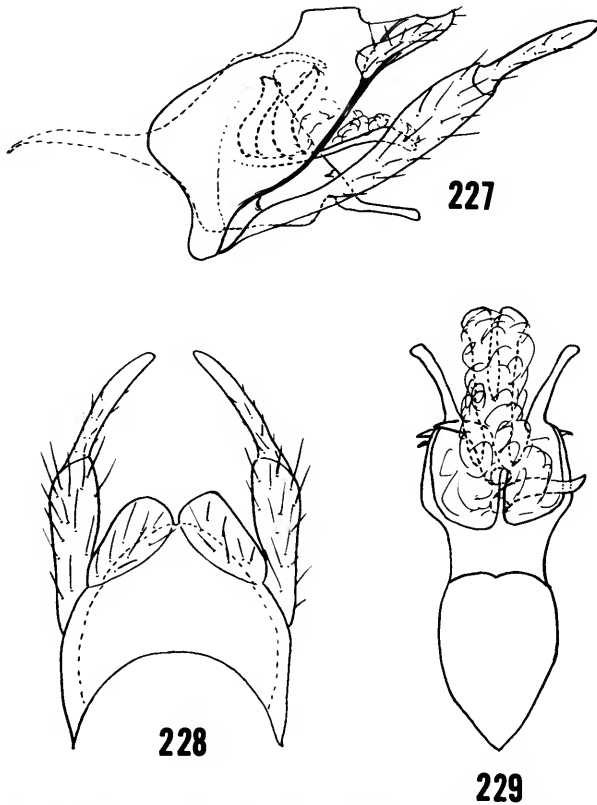
MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 12 km N Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr., 2♂. S.A. Prado, Sept 1981, G. Morales, 1♂ (UNCM). DPTO. VALLE DEL CAUCA: mts. E Palmira, 3,700' [–1,100 m], foliage near stream, 9 Jan 1963, H.B. Cunningham, 1♂ (INHS).

Smicridea (Smicridea) nigripennis Banks

FIGURES 227–229

Smicridea nigripennis Banks, 1920:359.—Fischer, 1963:134.—Flint, 1967c:14; 1981a:23.

This is the only species of the *nigripennis* group found in



FIGURES 227-229.—*Smicridea (Smicridea) nigripennis* Banks: 227, male genitalia, lateral; 228, same, dorsal; 229, phallus, dorsal.

Antioquia. It was described from "Caldras, Cali (H. Fassl)," but none of the labels on the types gives a collector's name. The labels read "Caldras Colombia 4400 ft.," or "Cali, Colombia, 500 ft." I believe it most likely that these are incorrectly

labelled examples collected by H.S. Parish in the Department of Valle del Cauca in 1914. Parish writes (in Alexander, 1916:1-3) of collecting stops at Caldas (at 4400 ft) on the railroad line between Buenaventura and Cali (which he reported at about 500 ft). In addition, there is material in the Cornell University collection of this species labelled "Caldas Colombia V-12-14 4400 ft H.S. Parish." Banks, in the same paper, did describe material from Peru collected by Parish on the same trip and correctly cited. The coincidence of sites, elevations, and Peruvian material leads me to believe that Banks mislabelled this collection.

In addition to these types from southwestern Colombia, the species is known from Venezuela and is here reported from Antioquia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 24 Feb 1983, O.S. Flint, Jr., 8♂. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 9♂, 1♀. Quebrada La Jiménez, Sopetrán (trap C), May 1983-Feb 1984, U. Matthias, 8♂, 15♀.

Subgenus *Rhyacophylax* Müller

The distribution of species in this subgenus parallels that of the typical subgenus, but it is a bit more restricted, running from the southwestern United States to central Chile, and not including either the Greater or Lesser Antilles. Nearly 50 species have been described, and an equal number of undescribed species have been collected and await description.

The immature stages are known, but have not been found to differ significantly from those of *Smicridea* s.s. They live in all sorts of lotic sites, often the largest lowland rivers where the other subgenus seems to be lacking. They do construct a fixed retreat and net as is typical of other genera in the subfamily. Their food habits have not been investigated, but probably consists primarily of detritus.

Key to Antioquian Species of *Rhyacophylax*

1. Phallus with a pair of apicodorsal lobes, caliperlike in posterior aspect *S. (R.) murina* McLachlan
 Phallus without such lobes 2
2. Phallus with a broad apicodorsal lobe overhanging venter and bearing small points laterally, with a lateral lobe also bearing small points apically *S. (R.) pseudoradula*, new species
 Phallus without such spiculate dorsal and lateral lobes 3
3. Basal segment of clasper with a posteroventral lobe visible in both lateral and posterior aspects *S. (R.) magnipinnata*, new species
 Basal segment of clasper without any basal lobe 4
4. Phallus without spicules on surface, but may bear small lobes 5
 Phallus bearing apically on external surface one or more rows of small spicules, and often spiculate processes 6
5. Internal sclerite of phallus in dorsal aspect with a pair of posterolateral arms arising from a broad anterior sclerite *S. (R.) magdaleneae*, new species
 Internal sclerite of phallus in dorsal aspect no more than a pair of narrow, linear sclerites *S. (R.) aurra*, new species

6. Phallus with large, spiculate, lateral arms arising at $\frac{3}{4}$ length of phallus
 *S. (R.) probolophora*, new species
 Phallus lacking large arms or with small, spiculate processes from near apex . . . 7
7. Tenth tergite in dorsal aspect with apex rounded 8
 Tenth tergite with apex sharply pointed 9
8. Apicolateral surface of phallus with a row of small spicules lateroventrally,
 becoming an irregular lateral patch of spicules subapically
 *S. (R.) biserrulata*, new species
 Surface of phallus with a midventral row of small spicules, and a lateral patch of
 spicules well before apex *S. (R.) acuminata* Flint
9. Pointed apices of tenth tergites directed mesad; ninth sternum projecting well beyond
 base of clasper; phallus with a small pointed apicolateral process and often a short
 row of lateral spicules as well as a midventral row of spicules
 *S. (R.) ventridenticulata*, new species
 Apices of tenth tergites directed posteriad; ninth sternum barely produced; phallus
 with a short, subapical, spiculate process, and a midventral row of spicules . . .
 *S. (R.) andicola*, new species

Smicridea (Rhyacophylax) murina McLachlan

FIGURES 230-233

Smicridea murina McLachlan, 1871:137-138.—Fischer, 1963:134.—
 Kimmins, 1957:106.

Rhyacophylax magnus Ulmer, 1909a:120-124; 1913:391, 407, 412.—Fischer,
 1963:136-137.—Weidner, 1964:95.

Rhyacophylax mendocensis Navás, 1920:42; 1924 ("1922"):368; 1934:170.

Synoestropsis mendocensis (Navás).—Lestage, 1925:41, 42.—Fischer,
 1963:210.

Rhyacophylax murina (McLachlan).—Flint, 1967a:55.

Smicridea (Rhyacophylax) zanclophora Flint, 1974b:39-40.—Maes and Flint,
 1988:5.

Smicridea (Rhyacophylax) magna (Ulmer).—Flint, 1975:570.

Smicridea (R.) murina McLachlan.—Flint, 1974c:88; 1989:33.

This species has recently been revised (Flint, 1989), and with the above synonymy established it is now known to be widely distributed from northern Nicaragua south to central Chile along the Andes Mountains. It appears to be common at the lower, drier, elevations of the Cauca valley. I have also seen the species from the following Colombian Departments in addition to Antioquia: Cauquetá, Chocó, Meta, Santander, and Valle del Cauca.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: "Finca Velásquez," Sopetrán, 14 Feb 1983, O.S. Flint, Jr., 11♂, 3♀. Río Aurrá, km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr., 23♂, 10♀; same, but 22 Feb 1984, C.M. & O.S. Flint, Jr., 2♂, 1♀. Río Aurrá, 7 km W San Jerónimo, 22-23 Feb 1984, C.M. & O.S. Flint, Jr., 33♂, 79♀. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 3-4 Mar 1984, C.M. & O.S. Flint, Jr., 6♂, 1♀.

Smicridea (Rhyacophylax) magnipinnata, new species

FIGURES 234-238

This is a very distinctive species of unknown relationship within the subgenus. It is the largest species known, and is very distinctively colored. The genitalia are equally unusual,

especially the lobe on the basal clasper segment and the high, arching phallus with its unusual apicolateral lobes.

ADULT.—Length of forewing, male 8-9 mm, female 10-11 mm. Width of eye of male in dorsal aspect about $\frac{1}{3}$ that of interocular distance. Color pale stramineous, antennae annulate; forewing pale stramineous in male with apical fourth whitish and with a whitish transverse band near midlength; in female with wings brown between pale bands. Male abdomen with processes of fifth sternum $1\frac{1}{2}$ times as long as sternum. **Male genitalia:** Ninth segment with anterolateral angle greatly produced, with dorsum expanded, overhanging lateral margin in dorsal aspect, with a deep, membranous area laterally between it and tenth tergum. Tenth tergite tapering apicad in both lateral and dorsal aspects. Clasper with basal segment long, with ventromesal margin produced into a distinct lobe; apical segment straight, apex rounded. Phallus tubular, with base large and erect, stem arched dorsad from base, tip slightly inflated; apex with rounded lateral plates, connected dorsally and with a dorsomesal notch; internal sclerites broad, quite indistinct.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 10 km E Medellín [road to Las Palmas], 6 Feb 1983, O.S. Flint, Jr. USNM Type.

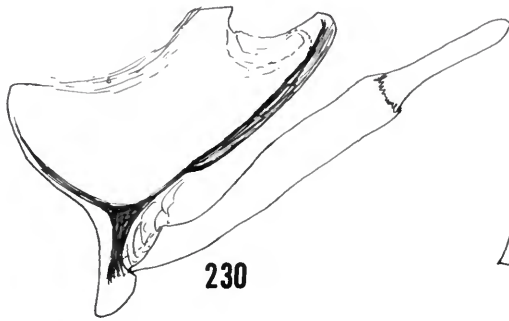
Paratypes: Same data as holotype, 2♀. Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 23 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. Urrao, 2000-2500 m, 18 Mar 1984, U. Matthias, 1♂.

Smicridea (Rhyacophylax) aurra, new species

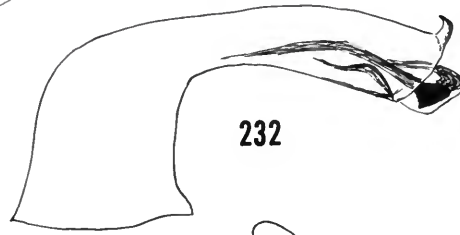
FIGURES 239-242

This species and *S. (R.) argentina* (Navás) are closely related as is shown by the possession of similar lobes on the phallus. However, in *S. (R.) aurra* the tenth tergites are more broadly rounded, and the phallus bears paired, ventrolateral carinae at the apex.

ADULT.—Length of forewing, 5 mm. Width of eye of male



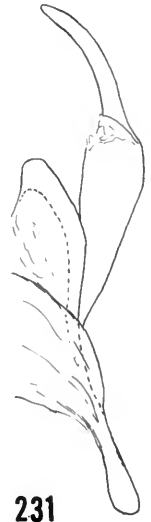
230



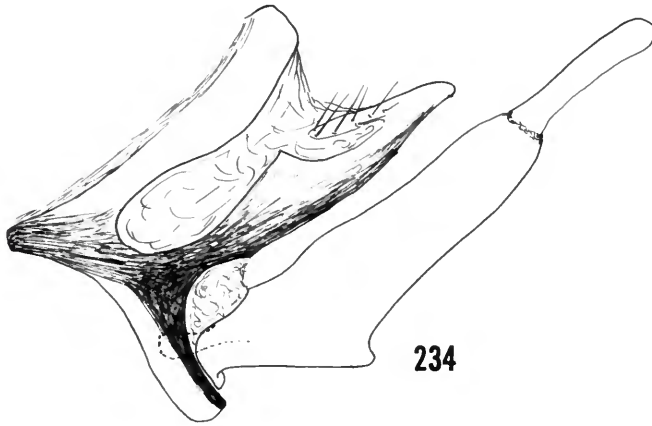
232



233



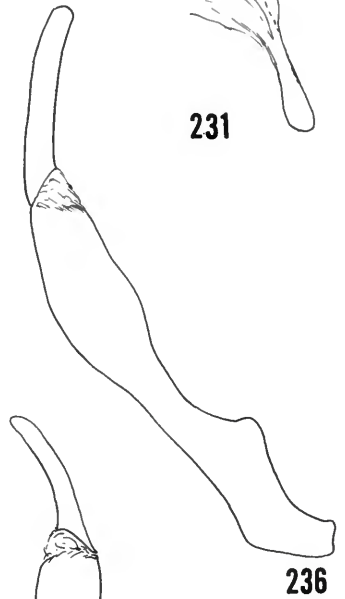
231



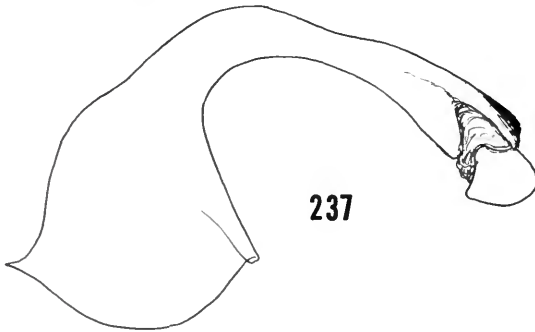
234



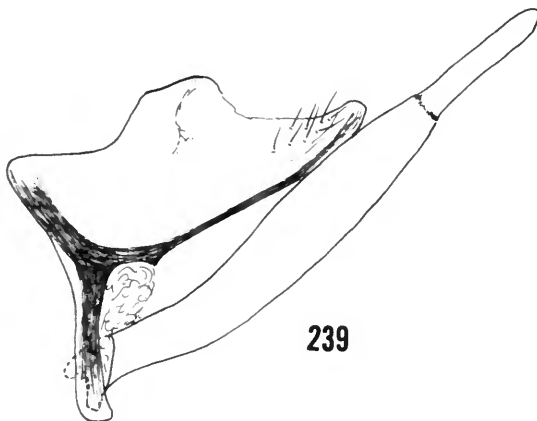
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237



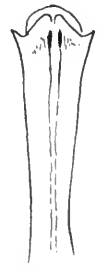
239



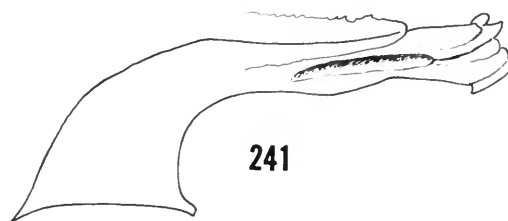
238



240



242



241

FIGURES 230–242.—*Smicridea (Rhyacophylax) murina* McLachlan: 230, male genitalia, lateral; 231, same, dorsal; 232, phallus, lateral; 233, tip of phallus, dorsal. *S. (R.) magnipinnata*, new species: 234, male genitalia, lateral; 235, same, dorsal; 236, clasper, posteroventral; 237, phallus, lateral; 238, tip of phallus, dorsal. *S. (R.) aurra*, new species: 239, male genitalia, lateral; 240, same, dorsal; 241, phallus, lateral; 242, tip of phallus, dorsal.

in dorsal aspect a bit more than $1/2$ that of interocular distance. Color brown, antennae annulate; forewing golden brown, with darker apical fourth, with inner margin scalloped and a darker marking along chord. Male abdomen with fifth sternal processes slightly longer than sternum. *Male genitalia*: Ninth segment with anterior margin produced into an angulate lobe. Tenth tergite tapered apicad in lateral aspect, broadly rounded in dorsal aspect. Clasper with basal segment long, almost parallel-sided; apical segment bluntly pointed. Phallus tubular, base slightly enlarged, with a lightly sclerotized lobe overlying phalotheca at midlength; apex very lightly sclerotized, with a pair of dorsolateral lobes and a central lobe, with elongate ventrolateral carinas; internal sclerite long, threadlike.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Río Aurrá, Km 50, E of San Jerónimo, 14 Feb 1983, O.S. Flint, Jr. USNM Type.

Smicridea (Rhyacophylax) magdalenae, new species

FIGURES 243–245

This species is closely related to *S. (R.) scutellaris* Flint and is most easily distinguished by the internal sclerites of the phallus. In *S. (R.) scutellaris* the internal sclerites of the phallus in dorsal and ventral aspect are united into a V-shaped structure about as long as wide with the point anterior. In *S. (R.) magdalenae* these are united into a structure with 2 parallel apical arms and an elongate, rectangular, anterior portion, all being more than twice as long as wide.

ADULT.—Length of forewing, 4–4.5 mm. Width of eye of male in dorsal aspect $1/3$ that of interocular distance. Color pale brown; forewing pale brown with darker marks along chord and in a scalloped, subterminal band. *Male genitalia*: Ninth segment with anterolateral margin produced, not noticeably upturned. Tenth tergite tapering to a narrow lobe in both dorsal and lateral aspects. Clasper with basal segment long and parallel-sided; apical segment long, slender, tip pointed. Phallus with base large, erect, stem about as long as base, slightly sinuous apicad; apex with small dorsolateral lobes, not developed into distinct points; internal sclerites consisting of two parallel apical arms with slight apicoventral hooks, united to a basal sclerite, rectangular in outline, with indistinct, threadlike sclerites anterior.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. TOLIMA: Armero, near Guyabal, 16–31 Jan 1977, E.L. Peyton, malaise trap #42. USNM Type.

Paratypes: Same data as holotype, 21♂, 15♀; 2–10 Feb 1977, 97♂, 30♀. DPTO. ANTIOQUIA: Río Claro [near Río Magdalena on Medellín-Bogotá highway], 3 May 1984, U.

Matthias, 2♂. DPTO. CUNDINAMARCA: Río Sumapaz gorge, E Melgar, 1000 m, 5 Jan 1959, J.F.G. Clarke, 9♂, 30♀.

Smicridea (Rhyacophylax) pseudoradula, new species

FIGURES 246–248

S. (R.) radula Flint and this species are very closely related, agreeing in all structure of the genitalia except the apex of the phallus. In *S. (R.) radula* the dorsal lobe is large and greatly overhangs the ventral lobe, which bears the spiculate patch. In *S. (R.) pseudoradula*, the dorsal lobe is not produced and the spiculate patch is clearly lateral in position.

ADULT.—Length of forewing, 4 mm. Width of eye of male in dorsal aspect $1/2$ that of interocular distance. Color stramineous; forewing with darker mark along chord, with a subterminal dark band bordered inwardly by paler brown and outwardly by slightly darker brown. Male with anterolateral processes of fifth sternum pale, extending to middle of sixth sternum. *Male genitalia*: Ninth segment with anterior margin produced into an upturned lobe; posterior margin ventromesally produced between base of claspers. Tenth tergite short, broadly rounded, with a distinct pointed process beneath apex. Clasper with basal segment inflated apicad; apical segment with apex rounded. Phallus with base enlarged and at right angles to stem; tip with a dorsal lobe bearing a few lateral spicules (number variable, often lacking), with strongly sclerotized lateral plates bearing spicules; with internal sclerites long and threadlike.

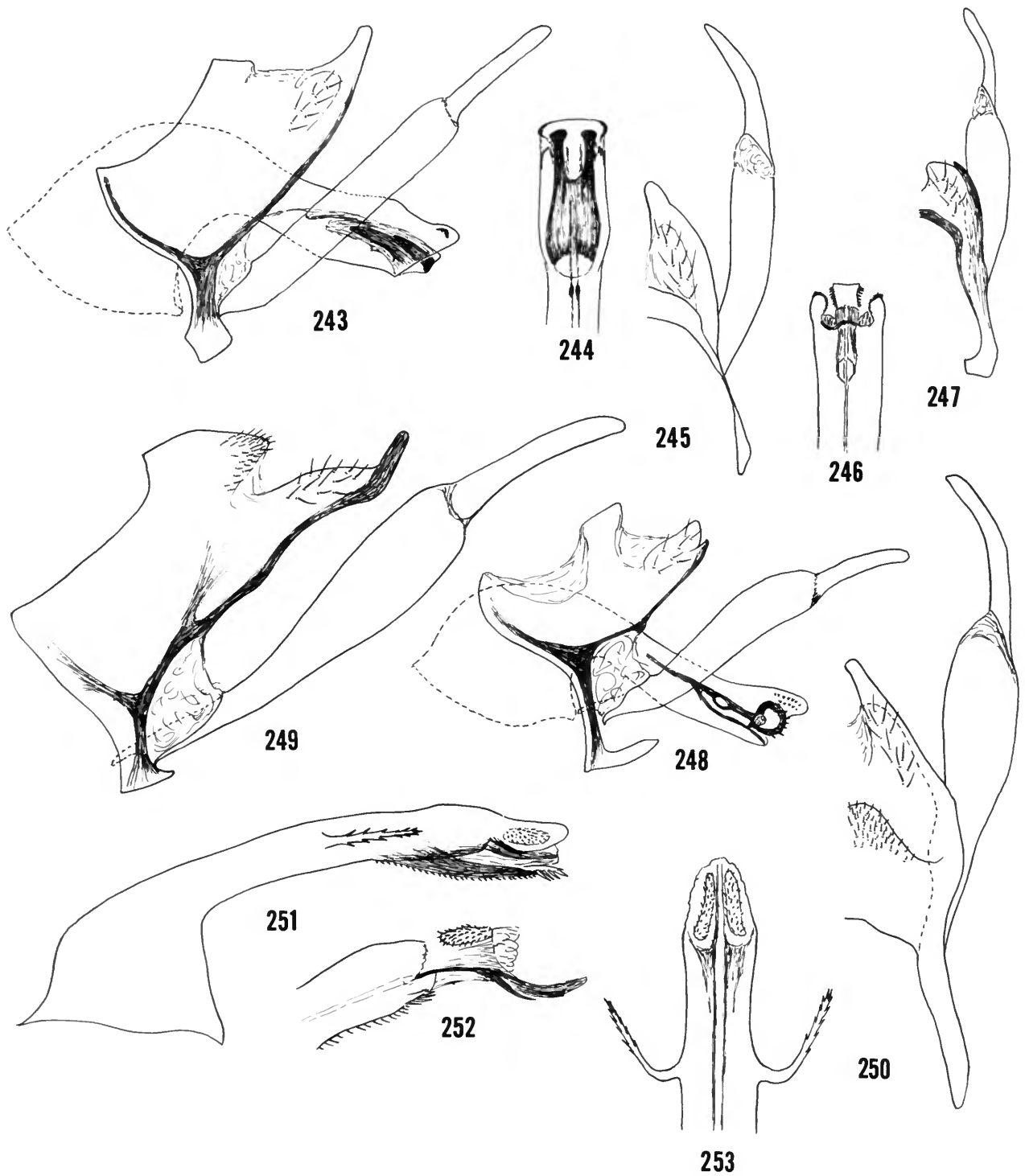
MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Río Aurrá, km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 7♂, 5♀. Río Aurrá, 7 km W San Jerónimo, 22–23 Feb 1984, C.M. & O.S. Flint, Jr., 8♂, 4♀. ECUADOR. PCIA. NAPO: 3 km N Tena at river, 5 Jul 1976, J. Cohen, 8♂, 2♀. Lago Agrio, 19 Sep 1975, A. Langley, 1♂. 3 km NE Lago Agrio, 17 May 1975, Spangler, et al., 1♂. VENEZUELA. EDO. BARINAS: Puente Parangula, 8 km S Barinitas, 18 Feb 1976, C.M. & O.S. Flint, Jr., 12♂, 14♀. Río Santo Domingo, Barinas, 27 Feb 1976, C.M. & O.S. Flint, Jr., 8♂. EDO. ZULIA: El Tucuco, 45 km SW Machiques, 5–6 Jun 1976, Menke and Vincent, 3♂; same, but Río El Tucuco, $1/2$ mi [~1 km] from Misión El Tucuco, 1–5 Oct 1979, H.M. Savage, 13♂.

Smicridea (Rhyacophylax) probolophora, new species

FIGURES 249–253

This is a most distinctive species of the *peruana* group. No other known species of the group bears a lateral process from the phallus. The dorsolateral spinous patch on the phallus suggests a relationship with *S. (R.) acuminata* Flint, but otherwise the species are easily distinguished. The phallus in *S. (R.) acuminata* bears a lateral patch of spicules in addition to



FIGURES 243–253.—*Smicridea (Rhyacophylax) magdaleneae*, new species: 243, male genitalia, lateral; 244, tip of phallus, dorsal; 245, male genitalia, dorsal. *S. (R.) pseudoradula*, new species: 246, tip of phallus, dorsal; 247, male genitalia, dorsal; 248, same, lateral. *S. (R.) probolophora*, new species: 249, male genitalia, lateral; 250, same, dorsal; 251, phallus, lateral; 252, tip of phallus with internal sclerites everted, lateral; 253, tip of phallus, dorsal.

the midventral spicule row, lacks the lateral process, and apicoventral small spines.

ADULT.—Length of forewing, male 5.5–7 mm, female 6–7.5 mm. Width of eye of male in dorsal aspect slightly less than $\frac{1}{3}$ that of interocular distance. Color pale, stramineous, antennae annulate; forewing pale, stramineous with apical fourth darker, with dark line over chord, and dark nygmal points; female with ground color darker (as in Flint, 1974b, Figs. 34, 35). Male abdomen with processes of fifth sternum almost twice as long as sternum. *Male genitalia*: Ninth segment with anterior margin moderately produced; dorsum with a posteromesal area bearing many spicules; posteroventrally produced into a small mesal lobe. Tenth tergite elongate, tip in lateral aspect narrow and upturned; in dorsal aspect with tip narrow and angled slightly mesad. Clasper with basal segment long, inflated apicad; apical segment with tip bluntly pointed in dorsal aspect. Phallus tubular, with basal section inflated; phalotheca bearing a spiculate lateral process on each side; tip with a midventral row of small points, with ventrolateral sclerotizations bearing several small spines apically; internal sclerites long and slender, bearing a pair of ventrolateral spines (best seen in everted position) and dorsolateral plate with spicules (which can be everted).

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 4♀. DPTO. META: Quebrada Blanca, 3 km W Restrepo, 11 Feb 1983, O.S. Flint, Jr., 18♂. VENEZUELA. EDO. MÉRIDA: La Pedregosa, Mérida, 21 Feb 1976, C.M. & O.S. Flint, Jr., 14♂, 10♀. Mérida, 1 Jun 1976, Menke and Vincent, 6♂, 8♀. El Vigía, 2 Jun 1976, Menke and Vincent, 1♂, 2♀. EDO. BARINAS: 22 km NW Barinitas, 24 Feb 1976, C.M. & O.S. Flint, Jr., 14♂, 5♀. Puente Parangula, 8 km S Barinitas, 18 Feb 1976, C.M. & O.S. Flint, Jr., 7♂, 9♀. Río Santo Domingo, Barinas, 17 Feb 1976, C.M. & O.S. Flint, Jr., 1♂. DISTRITO FEDERAL: Río Petaquire, below Bajo Seco [Estación Experimental Bajo Seco, ~15 km NW Colonia Tovar], 25 Jan 1983, O.S. Flint, Jr., 12♂, 10♀. EDO. ZULIA: El Tucuco, 45 km SW Machiques, 5–6 Jun 1976, Menke and Vincent, 20♂, 3♀.

Smicridea (Rhyacophylax) acuminata Flint

FIGURES 254–258

Smicridea (R.) acuminata Flint, 1974b:37; 1975:572.

This species is recorded from Costa Rica, Colombia (Cundinamarca) and Peru, and I have examples from Ecuador and Venezuela. It does not seem to be common in Antioquia. The two records of the species are old.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Alejandría, Feb. 1972, R. Vélez, 4♂ (UNCM). V[alle de] Medellín, Aug 1952, F.L. Gallego, 1♂ (UNCM).

Smicridea (Rhyacophylax) ventridenticulata, new species

FIGURES 259–262

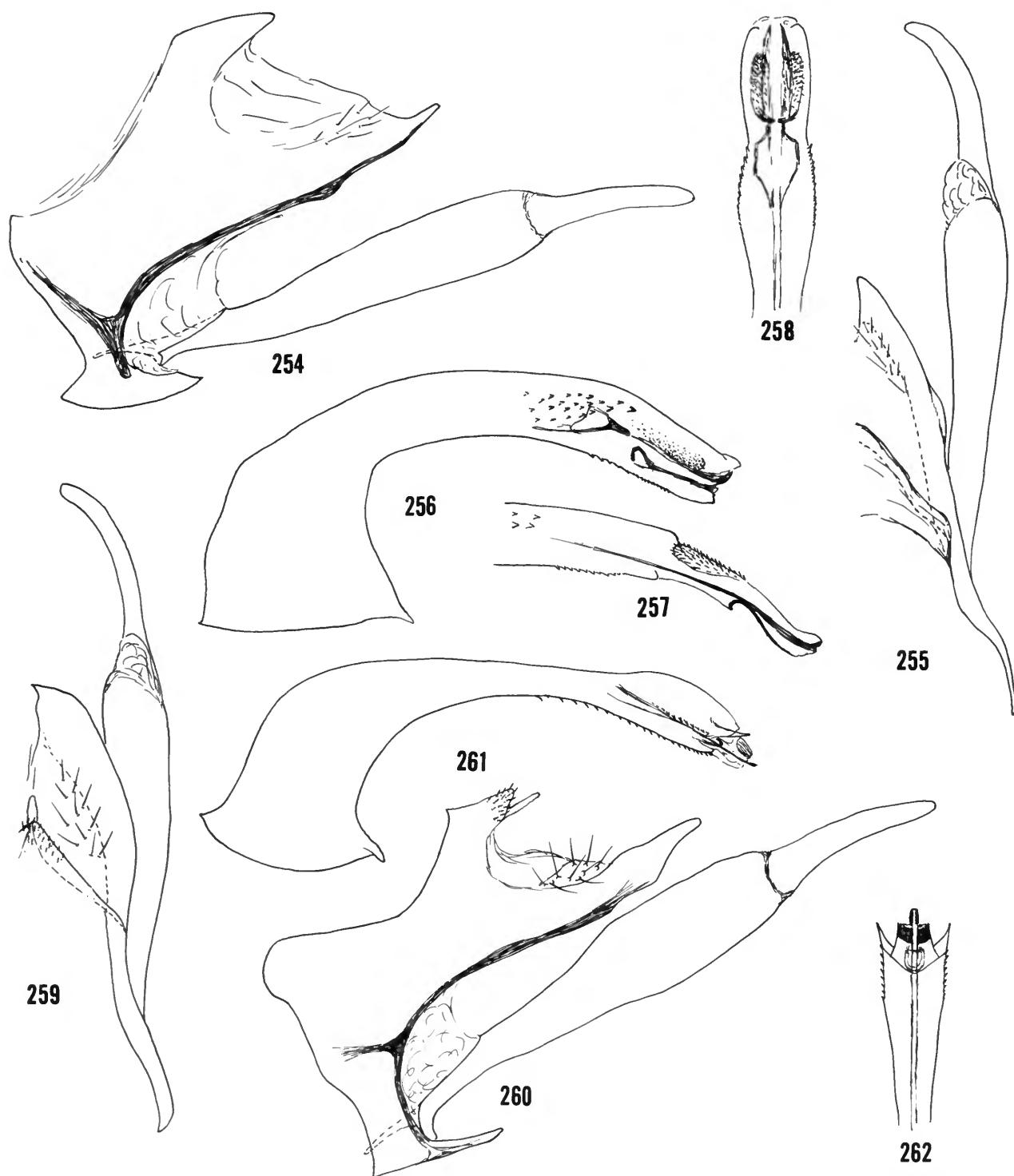
This species is very closely related to *S. (R.) peruana* (Martynov) with which it shares the small apicomeral point on the tenth tergite. *S. (R.) ventridenticulata* is to be recognized from *S. (R.) peruana* by the lack of the large patch of spicules dorsolaterally on the phallus and the much longer ventromesal lobe of the ninth sternum. The species is variable in the degree the lateral row of spicules leading to the apicolateral process is developed,—sometimes all are lacking; most often only a few, small ones are present; rarely a rather distinct row is seen. In addition, I am including a number of collections from Ecuador in this species (but not as paratypes) that lack the apicolateral processes of the phallus. These agree in all other manners with *S. (R.) ventridenticulata*.

ADULT.—Length of forewing, male 6–7.5 mm, female 7–8 mm. Width of eye of male in dorsal aspect slightly less than $\frac{1}{3}$ that of interocular distance. Color pale, stramineous, antennae annulate; forewing pale, stramineous, with apical fourth darker, with dark line over chord, and dark nygmal points; female with ground color darker (as in Flint, 1974b, Figs. 34, 35). Male abdomen with processes of fifth sternum about as long as sternum. *Male genitalia*: Ninth segment with anterior margin strongly produced, dorsal margin nearly horizontal; dorsum with a few spicules posteromesally, and a small mesal process; ventromesally with a large posterior lobe. Tenth tergite elongate, tip in lateral aspect narrowed apicad; in dorsal aspect with apex broadly rounded, with a small apicomeral point. Clasper with basal segment long, inflated apicad; apical segment with tip rounded in dorsal aspect. Phallus tubular, with basal portion slightly inflated, phalotheca with a midventral row of small points and a few lateral small points (these quite variable in number and presence) with a pointed, apicolateral process; internal sclerites long and slender, with a small, lightly sclerotized dorsal sclerite.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Agudelo, 2 km E El Retiro, 25 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 47♂, 14♀; same, but 8 Feb 1983, O.S. Flint, Jr., 6♂, 6♀. Quebrada La Cebolla, W La Fé, 21 Feb 1984, C.M. & O.S. Flint, Jr., 1♂; same, but trap A, July–Dec 1983, U. Matthias, 3♂, 2♀. DPTO. RISARALDA: 4 km E Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 21♂, 3♀. Térmale de Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. DPTO. SANTANDER: San Joaquín, 31 Aug 1965, W.D. Duckworth, 1♂. VENEZUELA. EDO. MÉRIDA: 4 km S Santo Domingo, 19–23 Feb 1976, C.M. & O.S. Flint, Jr., 12♂, 5♀. ECUADOR. PROV. MORONA-SANTIAGO: Gualaquiza, 14 Jun 1976, A. Langley et al., 1♂, 1♀.

OTHER—ECUADOR. [Cotopaxi Prov.] Pilaló to Tingo, 1000 m, 5 July 1965, L. Peña G., 20♂, 2♀. 113 km W



FIGURES 254-262.—*Smicridea (Rhyacophylax) acuminata* Flint: 254, male genitalia, lateral; 255, same, dorsal; 256, phallus, lateral; 257, tip of phallus with internal sclerites everted, lateral; 258, tip of phallus, dorsal. *S. (R.) ventridenticulata*, new species: 259, male genitalia, dorsal; 260, same, lateral; 261, phallus, lateral; 262, tip of phallus, dorsal.

Latacunga, 4500 ft [~1350 m], 1 July 1975, A. Langley and J. Cohen, 3♂. PROV. IMBABURA: Otavalo to Apuela, 2200 m, 8–9 Sep 1977, L.E. Peña G., 1♂. PROV. PICHINCHA: N Perucho, 18–19 Sep 1977, L.E. Peña G., 2♂, 14♀. [Chimborazo Prov.], Huigra, 4509 ft [1366 m], 13–14 Jun 1914, H.S. Parish, 3♂, 2♀.

Smicridea (Rhyacophylax) biserrulata, new species

FIGURES 263–266

Another species of the *peruana* complex, this one is distinguishable only by the genitalia. The tenth tergite is broadly rounded in *S. (R.) biserrulata*, but the tip is a small, blunt knob rather than pointed or narrowly elongate as in the other species. The phallus lacks a midventral row of spicules, but has a lateroventral row of spicules on each side that end in a small cluster of spicules apicolaterally.

ADULT.—Length of forewing, male 6–7 mm, female 7–8 mm. Width of eye of male in dorsal aspect slightly less than $1/3$ that of interocular distance. Color pale, stramineous, antennae annulate; forewing pale, stramineous, with apical fourth darker, with dark line along chord, with dark nymgal points; female with ground color darker (as in Flint 1974b, Figs. 34, 35). Male abdomen with processes of fifth sternum almost twice as long as sternum. *Male genitalia*: Ninth segment with anterior margin produced, dorsal margin nearly horizontal; dorsum with a few, very small, spicules posteromesally; ventromesally with a posterior lobe. Tenth tergite elongate, tip in lateral aspect narrowed apicad; in dorsal aspect with apex broadly rounded, with a small rounded apicomeral knob. Clasper with basal segment long, inflated apicad; apical segment with tip rounded in dorsal aspect. Phallus tubular, with basal portion inflated; phallosome apically with a ventrolateral row of points on each side, apicolaterally with a series of points (not on a process); internal sclerites long, slender, slightly angled at midlength, with a lightly sclerotized dorsal sclerite and a membranous ventral lobe.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [on road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 18♂, 11♀; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 12♂, 2♀. Quebrada La Mosca, 1 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 21♂, 51♀; same, but 2 Mar 1984, C.M. & O.S. Flint, Jr., 2♂, 4♀. Piedras Blancas, 10 km E Medellín [road to Guarne], 7 Feb 1983, O.S. Flint, Jr., 4♂; same, but 2 Mar 1984, C.M. & O.S. Flint, Jr., 8♂, 1♀. Quebrada El Pozo, 8 km W El Peñol, 9 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada La Agudelo, 2 km E El Retiro, 25 Feb 1984, C.M. & O.S. Flint, Jr., 3♂. Quebrada Potreritos, W La Fé, 26 Feb 1984, C.M. & O.S. Flint, Jr., 1♂, 1♀. Quebrada La Ayurá, above Envigado, 21 Feb 1984 C.M. & O.S. Flint, Jr., 1♂; same, but trap B, Apr 1983–Mar 1984, U. Matthias, 12♂, 14♀. Río Medellín, 5 km S Caldas, 16 Feb 1983, O.S. Flint, Jr.,

8♂, 1♀. Río Medellín, 6 km S Caldas, 24 Feb 1984, C.M. & O.S. Flint, 3♂, 6♀. Río Medellín, Estación Primavera, above Caldas, 1600 m, 30 Aug 1983, U. Matthias, 3♂, 8♀. Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 14 Feb 1983, O.S. Flint, Jr., 3♂; same, but 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. Río Aurrá, km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr., 8♂, 3♀; same, but 22 Feb 1984, C.M. & O.S. Flint, Jr., 3♂, 3♀. Río Aurrá, 7 km W San Jerónimo, 22 Feb 1984, C.M. & O.S. Flint, Jr., 15♂, 12♀. "Finca Velásquez," Sopetrán, 24 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 3–4 Mar 1984, C.M. & O.S. Flint, Jr., 7♂, 10♀. Urao, 2000–2500 m, 18 Mar 1984, U. Matthias, 1♂. DPTO. CHOCÓ: Río Habita, 20 km W Bolívar [in Antioquia], 17 Feb 1983, O.S. Flint, Jr., 1♂. DPTO. RISARALDA: Termas de Santa Rosa de Cabal, 29 Feb 1984, C.M. and O.S. Flint, Jr., 6♂, 2♀. 4 km E Santa Rosa de Cabal, 29 Feb 1984, C.M. & O.S. Flint, Jr., 9♂. DPTO. CAUCA: Río Blanco, 18 km N Popayán, 1800 m, 26 Jan 1959, J.F.G. Clarke, 4♂, 4♀. DPTO. SANTANDER: San Joaquín, 30 Aug 1965, W.D. Duckworth, 1♂. ECUADOR. PCIA. PICHINCHA: 14 km E Santo Domingo de los Colorados, 5 Jul 1975, Langley and Cohen, 10♂.

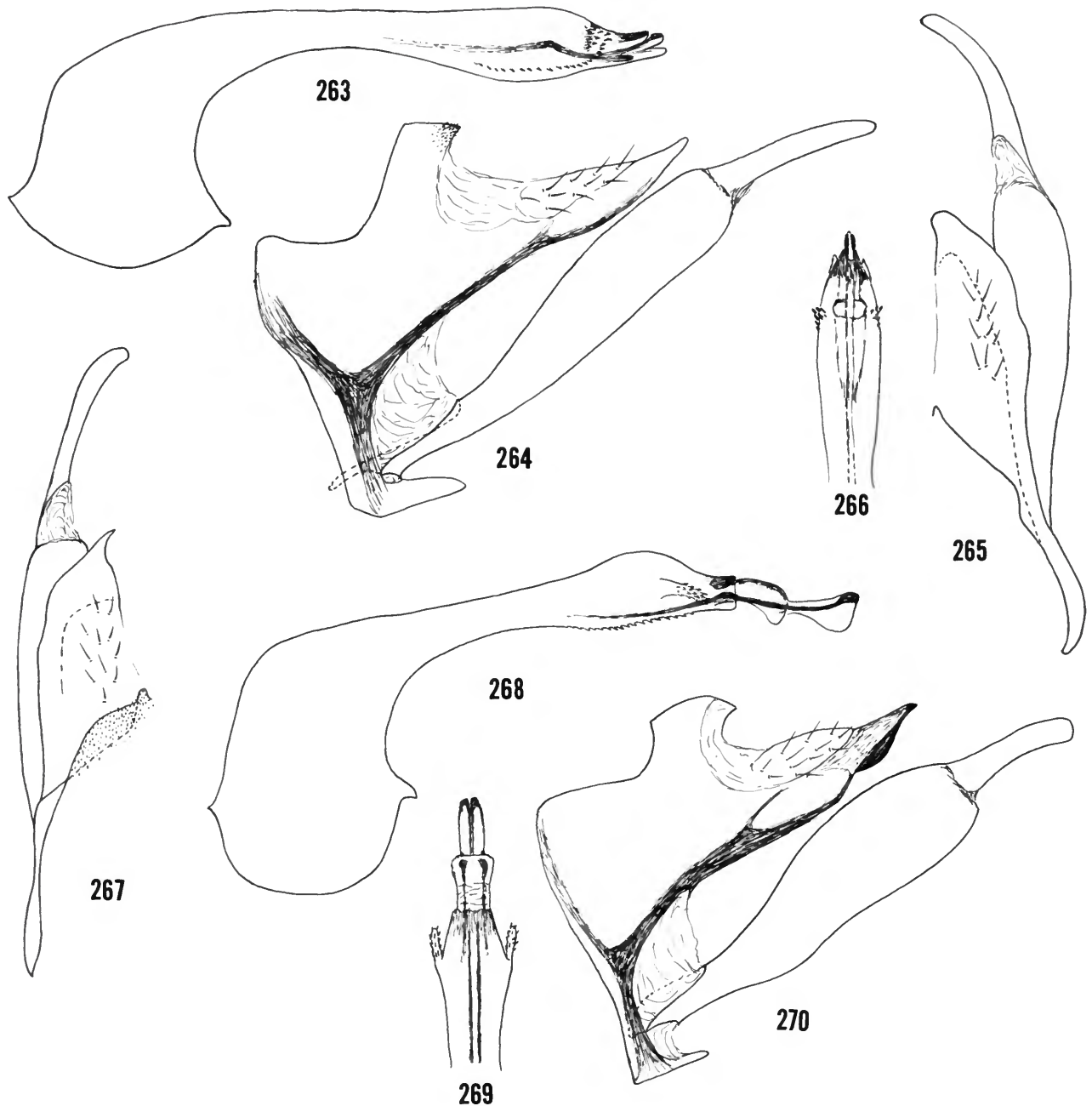
Smicridea (Rhyacophylax) andicola, new species

FIGURES 267–270

This species is a member of the *peruana* group, closest to *S. (R.) peruana* (Martynov) itself. It is distinguished by the pointed apices of the tenth tergites being widely separated mesally and directed more posteriad than mesad, and in the phallus by possessing a pair of spinose, decurved apicolateral processes and in lacking the dorsolateral group of spinules at midlength.

ADULT.—Length of forewing, 6 mm. Width of eye of male in dorsal aspect slightly less than $1/2$ that of interocular distance. Color stramineous; forewing with a dark mark along chord, in a subterminal band, and dark spot in cell M, apex slightly darker; female darker (as in Flint, 1974b, Figs. 34, 35). Male with anterolateral processes of fifth sternum length of sternum. *Male genitalia*: Ninth segment with anterolateral margin nearly vertical; sternum with a strong posteromesal point. Tenth tergum dorsomesally with a small spinulose lobe; tergites elongate, widely separated mesally, tip produced into a sharp point, ventrolateral margin strongly sclerotized. Clasper with basal segment enlarged apically, ventral margin irregular; apical segment rounded apically. Phallus tubular, with basal portion at right angles to stem, inflated; phallosome slightly enlarged subapically, with apicoventral margin serrate, apex with a decurved, spinose process laterally, with a lightly sclerotized dorsal sclerite; internal sclerites long and humped at midlength.

MATERIAL.—*Holotype*, male: ECUADOR. PROV. PASATAZA: Puyo, 29 May 1975, Cohen and Langley. USNM Type.



FIGURES 263-270.—*Smicridea (Rhyacophylax) biserrulata*, new species: 263, phallus, lateral; 264, male genitalia, lateral; 265, same, dorsal; 266, tip of phallus, dorsal. *S. (R.) andicola*, new species: 267, male genitalia, dorsal; 268, phallus, lateral; 269, tip of phallus, dorsal; 270, male genitalia, lateral.

Paratypes: Same data as holotype, 7♂, 4♀; same, but 1-7 Feb 1976, Spangler et al., 1♂, 5♀; same, but 30 Jan 1976, 3280 ft [994 m], 1♂, 19♀; same, but 10 May 1977, 1♀; same, but 1.5 km N Puyo, 6 May 1977, 1♂; same, but 3 km N Puyo, 30 May 1975, 6♂, 5♀; same, but 5 km E Puyo, 17 May 1977, 5♂, 6♀; same, but 2.5 km S Puyo, 8 May 1977, 8♂, 30♀; same, but 18

May 1977, 1♂; same, but 21 May 1977, 4♀; same, but 12 km W Puyo, 9 May 1977, 8♂, 4♀; same, but 16 km W Puyo, 3 Feb 1976, 11♂, 13♀; same, but 22 km W Puyo, 5 Feb 1976, 2♂. PROV. TUNGURAHUA: 5 km E Baños, 26 Jan 1976, Spangler et al., 2♂, 1♀; same, but 39 km E Baños, 4200 ft [~1300 m], 25 Jan 1976, 53♂, 31♀. PROV. NAPO: Río Aguarico, 48 km W

Lago Agrio, 20 Sep 1975, Langley and Cohen, 1♂, 1♀. COLOMBIA. DPTO. ANTIOQUIA: Medellín, 8 Jan 1960, Gallego, 5♂, 4♀; 14 Jan 1960, 1♂. DPTO. META: Quebrada Blanca, 3 km W Restrepo, 11 Feb 1983, O.S. Flint, Jr., 3♂, 7♀.

Genus *Macronema* Pictet

This genus as it is currently defined is limited to the Neotropical realm from Mexico south to northern Argentina, including the Greater Antilles. In this area 26 species are recognized, but more are known to exist.

The larvae are very distinctive and have been described a number of times (Flint and Bueno-Soria, 1982; Marlier, 1964). They live in flowing water, but generally with a rather slow current. They construct silken tubes, apparently without nets, that are spun in masses of roots, organic debris, or loose sand. They apparently bite small cubic chunks out of plant matter in their surroundings.

Macronema hageni Banks

FIGURES 271-273, 404

Macronema hageni Banks, 1924:452.—Fischer, 1963:187.—Flint, 1967c:10; 1974d:112; 1978:392-393, 402.

This is perhaps the most widespread and frequently encountered species of the genus in South America. It is recorded from Argentina, Bolivia, Brazil, Ecuador, Paraguay, Suriname, Peru, Venezuela, and now Colombia. It is typically taken near streams and slowly flowing rivers in lowland areas.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Tarazá, April 1972, R. Vélez, 1♂ (UNCM).

Genus *Macrostemum* Kolenati

This genus was recently resurrected (Flint and Bueno-Soria, 1982) from the synonymy of the preceding genus. It is worldwide in distribution (except Europe and most of northern Asia), and is found from Canada to northern Argentina, but not the West Indies, in the New World. It contains nearly 100 described species over the world with about 15 recorded from the neotropics.

The larvae of a number of species from North and South America, Asia, and Africa have been described (Marlier, 1964; Ross, 1944; Wiggins, 1977). They construct complex silken tubes with fine trap nets that strain small organic particles from the flowing water in which they live (Sattler, 1963; Wallace, 1975). Their food appears to be very fine organic particles that are suspended in the flowing waters.

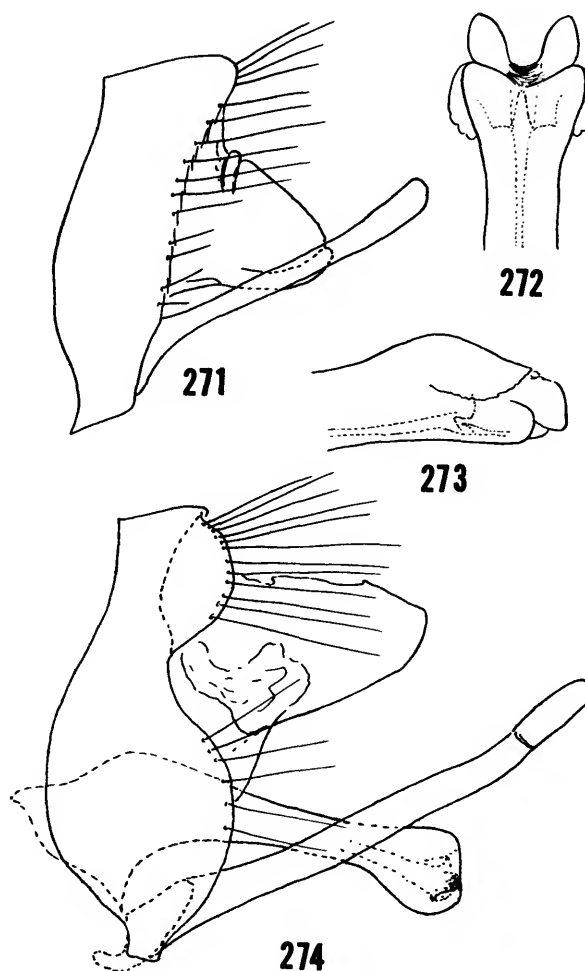
Macrostemum ulmeri (Banks)

FIGURES 274, 405

Macronema ulmeri Banks, 1913:237.—Fischer, 1963:199.—Flint, 1967c:11; 1974d:107; 1978:388, 400.

Macrostemum ulmeri (Banks).—Flint and Bueno-Soria, 1982:369.

This is one of the most widespread neotropical species of this



FIGURES 271-274.—*Macronema hageni* Banks: 271, male genitalia, lateral; 272, tip of phallus, ventral; 273, same, lateral. *Macrostemum ulmeri* (Banks): 274, male genitalia, lateral.

genus. It is recorded or known from Brazil, Colombia, Costa Rica, Ecuador, Honduras, Panama, Peru, Suriname, and Venezuela. It is generally taken near small forest streams. The males often are seen flying in small swarms over the water.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Tarazá, Jan 1972, A. Madrigal, 1♂, 2♀ (UNCM). Caceres, Sep 1953, Gallego, 1♀ (UNMC). Porce, Aug 1977, G. Morales, 1? (UNCM). [Department unmentioned, but see DeMarmels, 1985, for probable location], Río Negro, 500 m, 1♂, holotype (MCZ).

Genus *Centromacronema* Ulmer

The species of this genus are rather similar in appearance to those of *Macronema*, but never have large green areas on the forewings. All the species of the genus are limited to the New World from central Mexico to southern Brazil and Bolivia, but

none are known from the West Indies. The nearly 10 species are, in general, difficult to define and several have a number of named forms.

The larvae have not yet been definitely associated with any species of the genus. Adults are found flying, generally in daytime, near small and medium sized streams.

Key to Antioquian Species of *Centromacronema*

- Forewing yellow on basal 2/3, fuscous beyond, rarely almost entirely fuscous *Centromacronema apicale* (Walker)
- Forewing golden-brown on basal 2/3, apical third with a large, ovoid, pale mark *Centromacronema excisum* (Ulmer)

***Centromacronema excisum* (Ulmer)**

FIGURE 407

Macronema excisum Ulmer, 1905a:85-86.
Centromacronema excisum (Ulmer).—Ulmer, 1905b:87.—Fischer, 1963:204.—Flint, 1966:6.

This species has been recorded only from Ecuador and Venezuela, and I have examples from Peru. The species was found commonly by small, slowly flowing streams in the Department of Chocó, Colombia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Puerto Valdivia, Jan 1979, R. Vélez, 2♂ (UNCM). DPTO. CHOCÓ: Bahía Solano, Dec 1958, R. Vélez, 2♂ (UNCM). Quebrada Pichinde, 2 km E San Pablo, 19 Feb 1983, O.S. Flint, Jr., 11♂. Quebrada Salero, Las Animas, 19 Feb 1983, O.S. Flint, Jr., 6♂. 3 km N Certegui, 19 Feb 1983, O.S. Flint, Jr., 18♂. 8 km W Loro, 18 Feb 1983, O.S. Flint, Jr., 5♂.

***Centromacronema apicale* (Walker)**

FIGURES 408

Macronema ? apicalis Walker, 1852:78.
Centromacronema apicale (Walker).—Ulmer, 1905b:87-88.—Betten and Mosely, 1940:205-207.—Fischer, 1963:201-202.

The species was originally described from Venezuela and has since been recorded from Colombia and Peru. In coloration it is rather variable, but basically ochreous for the basal 2/3 of the forewing, at which point is a distinct transverse line. On both sides of this line the wing is very variably infuscate for the apical third, and then basad a bit along the anal margin. In certain examples, referred to as variety, the apical infuscation has so increased as to almost completely obscure the ochreous coloration.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Agua Mala, 34 km NW Medellín [road to San Jerónimo], 14

Feb 1983, O.S. Flint, Jr., 15♂, 1♀; same, but 24 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. 24 km NW Medellín [road to San Jerónimo], 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♂, 1♀. 27 km NW Medellín [road to San Jerónimo], 23 Feb 1984, C.M. & O.S. Flint, Jr., 5♂. 18 km E San Jerónimo, 23 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. 12 km NW Medellín [road to San Pedro], 20 Feb 1984, C.M. & O.S. Flint, Jr., 3♂. Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada Bocana, 8 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♂. 12 km E Medellín [road to Sta. Elena], 6 Feb 1983, O.S. Flint, Jr., 2♂. 10 km E Medellín [road to Las Palmas], 21 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada La Ayurá, above Envigado, 21 Feb 1984, C.M. & O.S. Flint, Jr., 2♂; same, but trap B, Oct 1983-Mar 1984, 3♀. 12 km N Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr., 11♂. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 1♂, 1♀. Cocomá, Jul 1950, A.M. del Corral, 4♂ (UNCM).

VARIETY.—Quebrada La Iguaná, 17 km NW Medellín [road to San Jerónimo], 22 Feb 1984, C.M. & O.S. Flint, Jr., 6♂, 1♀; same, but 14-15 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada La Cebolla, El Retiro (trap A), 5 Jun 1983, U. Matthias, 1♂.

Genus *Leptonema* Guérin

This genus contains 105 recognized species of which 90 are found in the Neotropical realm, with the remaining limited to Africa and Madagascar. Species are found from the southwestern United States south to central Argentina, including Cuba and the Lesser Antilles.

The larvae of several species have been described (Flint and Wallace, 1980; Wiggins, 1977). They construct retreats and nets on downed trees, rocks, and other solid matter in flowing water. Some species inhabit small, tumbling, mountain streams; others the largest lowland rivers. They apparently feed on particulate, organic matter swept into the net.

Key to Antioquian Species of *Leptonema*

- 1. Forewing with a striking pattern of brown and fuscous markings on an ochreous background *L. cinctum* Ulmer
- Forewing nearly uniformly pale green or ochreous, often with two fuscous spots 2

2. Forewing with 2 fuscous spots near the base of Sc 3
Forewing without dark spots in this position 4
3. Forewing pale green with 2 fuscous spots basally on Sc
. *L. columbianum* Ulmer
Forewing ochreous to brown with 2 fuscous spots basally on Sc and a darker
subterminal cross-band *L. divaricatum* Flint, McAlpine, and Ross
4. Forewing pale green, sometimes infusate apically and rarely with 2 fuscous spots .
. 5
Forewing pale brown, with 2 distinct fuscous spots centrally and slightly infusate
apically 7
5. Male genitalia with tenth tergum bearing a ventrolateral process; phallus with a
tripartite process middorsally *L. tripartitum* Flint, McAlpine, and Ross
Genitalia with neither a ventrolateral process from the tenth tergum, nor a middorsal
process on the phallus 6
6. Phallus with processes *c* and *e* present and pointing ventrad
. *L. albobirens* (Walker)
Phallus lacking processes *c* and *e*, processes *a*, *b*, and *g* developed and bearing
dorsolateral points *L. andinum*, new species
7. Phallic process *b* short, barely reaching ventral margin of phallus
. *L. neadelphus* Flint, McAlpine, and Ross
Phallic process *b* elongate, extending well beyond ventral margin of phallus . . . 8
8. Phallic process *e* an elongate, slender lobe bearing short, spinelike setae
. *L. spirillum* Flint, McAlpine, and Ross
Phallic process *d* and *e* united into a large fanlike array of large setae
. *L. stigmatosum* Ulmer

***Leptonema cinctum* Ulmer**

FIGURES 275-277, 406

Leptonema cinctum Ulmer, 1905a:64, 65.—Fischer, 1963:167.—Flint, 1966:5.—Flint, McAlpine, and Ross, 1987:17.

This distinctly marked species was described from Ecuador and recently recorded from Colombia. The only example I have taken of the species was swept in daytime from branches beside a tumbling mountain brook less than a meter in width.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Caldas, Oct 1973, R. Vélez, 1♂ (UNCM). DPTO. CHOCÓ: km 114, 6 km E El Siete, 17 Feb 1983, O.S. Flint, Jr., 1♂.

***Leptonema columbianum* Ulmer**

FIGURES 278-280

Leptonema columbianum Ulmer, 1905a:61, 62.—Fischer, 1963:168.—Flint, McAlpine, and Ross, 1987:33, 34.

This is a frequently encountered and widespread species over most of South America: Argentina, Bolivia, Brazil, Colombia, Guyana, Paraguay, Peru, Suriname, and Venezuela. Larvae have been found on large pieces of wood and downed trees in large lowland rivers (Flint and Wallace, 1980). The males are infrequently taken at lights, to which the females are readily attracted.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Puerto Berrío, Dec 1952, Gallego, 1♂ (UNCM). "Finca Velásquez,"

Sopetrán, 14 Feb 1983, O.S. Flint, Jr., 1♀. In addition, the species is recorded from the Departments of Amazonas, Caquetá, Chocó, Cundinamarca, and Meta in Colombia.

***Leptonema divaricatum* Flint, McAlpine, and Ross**

FIGURES 281-283

Leptonema divaricatum Flint, McAlpine, and Ross, 1987:36, 37.

This recently described species is identical to *L. crassum* Ulmer in appearance, differing only in the male phallus. It is known from Colombia, Costa Rica, Ecuador, and Venezuela. It has been taken near rather large, fast-flowing rivers with a bottom of gravel and rocks.

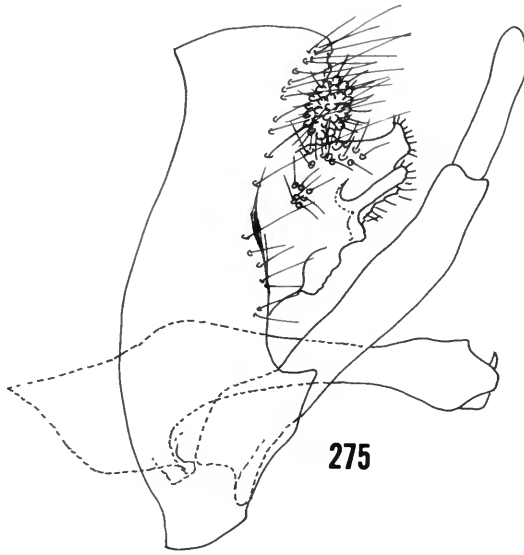
MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: quebrada al Río Samaná, Cabernas del Nus, 400 m, 11 Jun 1983, U. Matthias, 3♂, 10♀. Turbo, Oct 194?, F.L. Gallego, 1♂ (UNCM). It has been recorded from the Departments of Caquetá, Cundinamarca, and Meta in Colombia.

***Leptonema neadelphus* Flint, McAlpine, and Ross**

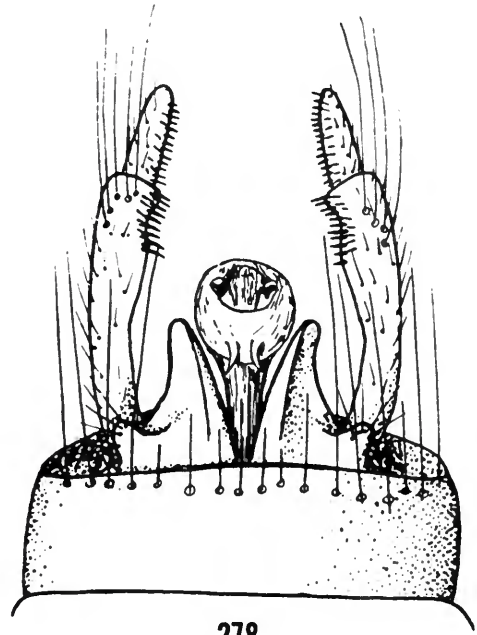
FIGURES 284-288

Leptonema neadelphus Flint, McAlpine, and Ross, 1987:49, 50.

This species, *L. stigmatosum* Ulmer and *L. spirillum* Flint, McAlpine and Ross, are all closely related and cannot be reliably told apart on the basis of appearance. The differences in the male genitalia are also small, but consistent. Females of this



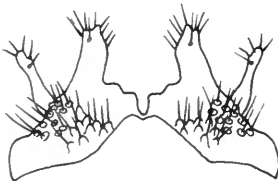
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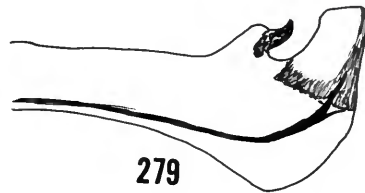
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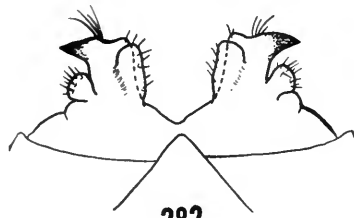
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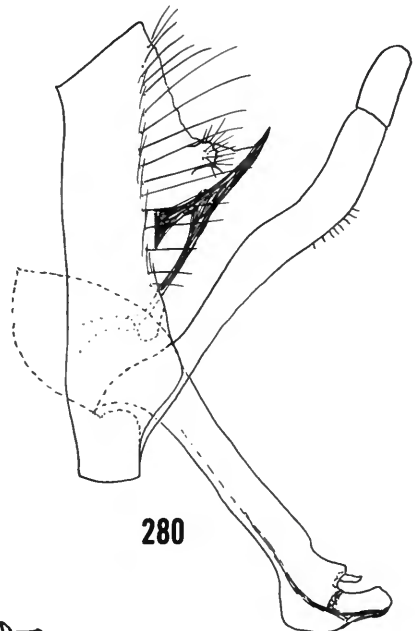
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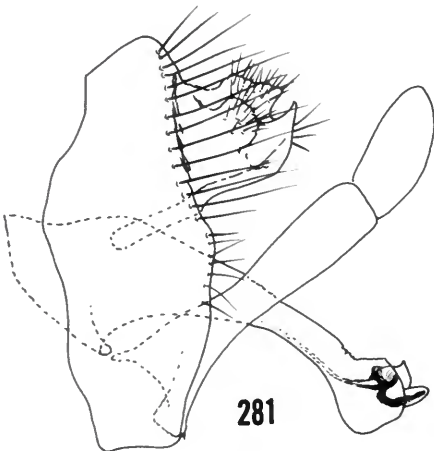
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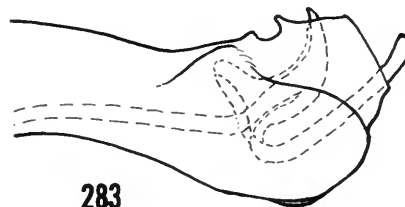
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281



283

FIGURES 275-283.—*Leptonema cinctum* Ulmer: 275, male genitalia, lateral; 276, tip of phallus, lateral; 277, tenth tergum, dorsal. *L. columbianum* Ulmer: 278, male genitalia, dorsal; 279, tip of phallus, lateral; 280, male genitalia, lateral. *L. divaricatum* Flint, McAlpine, and Ross: 281, male genitalia, lateral; 282, tenth tergum, dorsal; 283, tip of phallus, lateral.

group, which are attracted to light in large numbers, cannot yet be identified to species; therefore, only the males are listed even though there are many more females in the collection.

L. neadelphus is known from Colombia and Venezuela. It is frequently taken together with the other species. All inhabit brooks and small streams, generally fast-flowing and even tumbling, in the mountains and highlands.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 10 km E Medellín [road to Las Palmas], 6 Feb 1983, O.S. Flint, Jr., 1♂ holotype; same, but 21 Feb 1984, C.M. & O.S. Flint, Jr., 3♂. 12 km E Medellín [road to Sta. Elena], 6 Feb 1983, O.S. Flint, Jr., 1♂. Piedras Blancas, 10 km E Medellín [road to Guarne], Apr 1963, 1♂ (UNCM); same, but 2 Mar 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada La Mosca, 1 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada El Retiro, 16 km NW Medellín [road to San Pedro], 20 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada La García, 20 km NW Medellín [road to San Pedro], 13 Feb 1983, O.S. Flint, Jr., 1♂.

Leptonema spirillum Flint, McAlpine, and Ross

FIGURES 289-293

Leptonema spirillum Flint, McAlpine, and Ross, 1987:50.

This species is the most widespread of this group, being known from Bolivia, Colombia, Ecuador, Peru, and Venezuela. It, too, inhabits small mountain streams.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Andes, Aug 1955, N. Delgado, 1♂ (UNCM). Río Aurrá, km 50, near San Jerónimo, 14 Feb 1983, O.S. Flint, Jr., 1♂, 1♀. Quebrada La Ayurá, Envigado (trap B), Apr 1983–Jan 1984, U. Matthias, 37♂, (?19♀). It has been taken also in the Departments of Meta, Risaralda, and Valle del Cauca in Colombia.

Leptonema stigmatum Ulmer

FIGURES 294-297

Leptonema stigmatum Ulmer, 1905a:60.—Fischer, 1963:173.—Flint, 1966:6.—Flint, McAlpine, and Ross, 1987:50, 51.

Originally described from Ecuador, it is also recorded from Colombia and Venezuela. It frequents small streams in company with *L. neadelphus* Flint, McAlpine, and Ross, as discussed under that species.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Mosca, 1 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 1♂. Río Medellín, Est. Primavera above Caldas, 1600 m, 30 Aug 1983, U. Matthias, 1♂. Quebrada La Ayurá, Envigado (trap B), Mar–Aug 1983, U. Matthias, 7♂, (?2♀). It is also known from the Departments of Cundinamarca and Valle del Cauca in Colombia.

Leptonema tripartitum Flint, McAlpine, and Ross

FIGURES 298-302

Leptonema tripartitum Flint, McAlpine, and Ross, 1987:64, 65.

This pale green species was described from Colombia and Venezuela. Adults have been taken near a small, tumbling mountain brook near Fredonia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 2450 m, 22 Feb 1983, O.S. Flint, Jr., 7♂, 4♀, including holotype; same, 3–4 Mar 1984, C.M. & O.S. Flint, Jr., 1♀. It is also recorded from the Department of Magdalena in Colombia.

Leptonema albovirens (Walker)

FIGURES 303-307

Macronema albovirens Walker, 1852:76.

Leptonema albovirens (Walker).—Fischer, 1963:166.—Flint, McAlpine, and Ross, 1987:65.

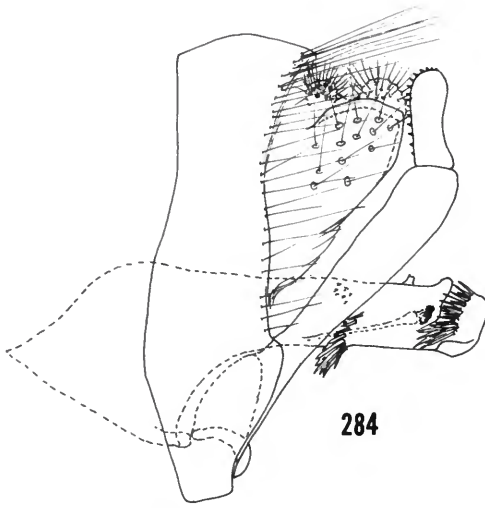
This is a very widespread species over Central America, northern South America, and the Lesser Antilles: USA (Texas), Mexico, Guatemala, Belize, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Trinidad, Tobago, Grenada, and St. Vincent. It is found in small rivers and streams of low gradient, but with rocky bottoms, often with rather poor water quality.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Río Aurrá, km 50, near San Jerónimo, 24 Feb 1983, O.S. Flint, Jr., 4♂, 1♀. Río Aurrá, 7 km W San Jerónimo, 22–23 Feb 1984, C.M. & O.S. Flint, Jr., 1♀. Quebrada La Jiménez, Sopetrán (trap C), May–Dec 1983, U. Matthias, 4♂, 5♀. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 7♂, 5♀; same, but 3–4 Mar 1984, C.M. & O.S. Flint, Jr., 1♂, 4♀. Fredonia, 17 Oct 1970, M. García, 1♂ (UNCM). Quebrada La Ayurá, Envigado (trap B), 27 Nov 1983, U. Matthias, 1♂. Medellín, Mar 1942, F.L. Gallego, 2♂, 3♀. [alle de] Medellín, Feb 1939, Gallego, 1♀; Jul 1945, 1♀ (UNCM). Cisneros, Río Nus, Dec 1941, Gallego, 1♂ (UNCM). Tarazá, Jan 1972, A. Madrigal, 1♀ (UNCM). Porce, Aug 1977, R. Vélez, 2♂, 1♀ (UNCM). In addition, material has been seen from the Departments of Cundinamarca, Meta, Tolima, and Valle del Cauca in Colombia.

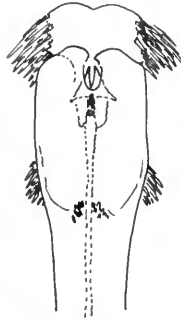
Leptonema andinum, new species

FIGURES 308-314

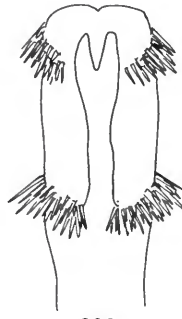
This species is a member of the *plicatum* group, closely related to *L. simplex* Mosely from Ecuador. It is distinguished from the latter primarily by the structure of the apex of the phallus. In *L. andinum* the lateral angles of process *a* are produced into points, process *g* is more pointed with the point directed dorsad, process *b* ends in an evenly reflexed point, and there is a strong lateral row of small teeth apically on the phallotheca.



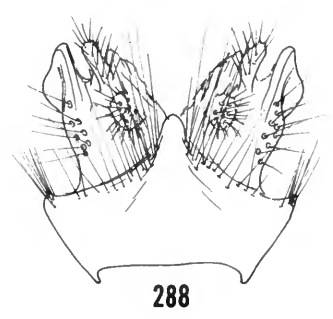
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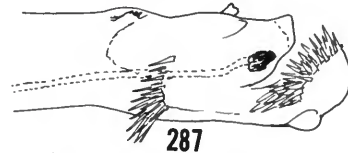
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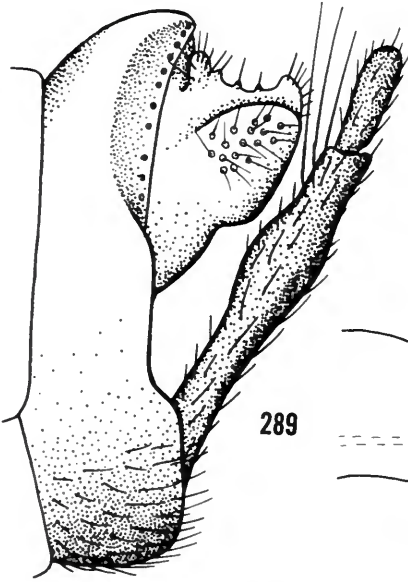
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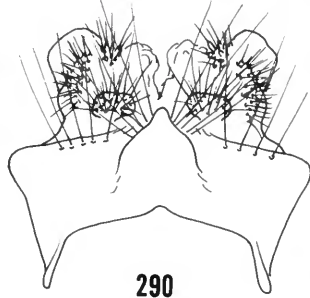
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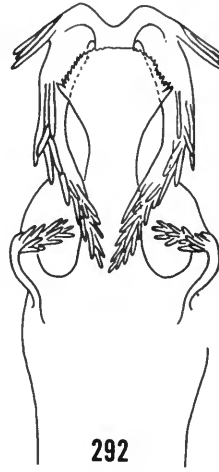
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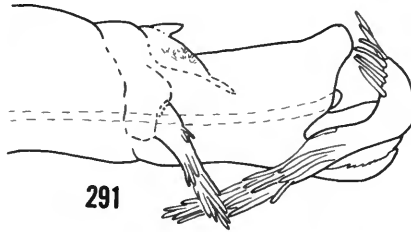
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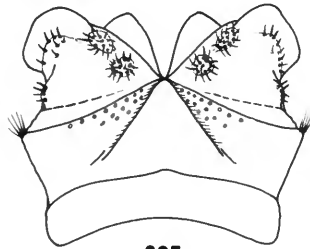
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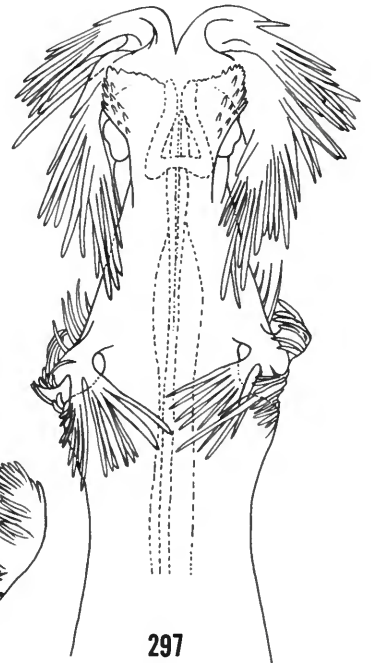
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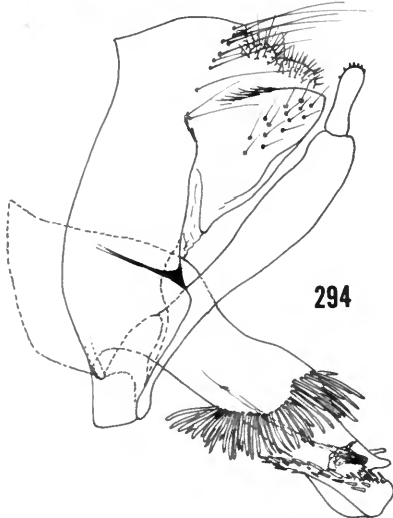
291



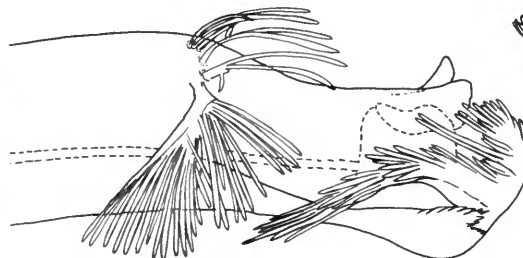
295



297



294



296

FIGURES 284-297.—*Leptonema neadelphus* Flint, McAlpine, and Ross: 284, male genitalia, lateral; 285, tip of phallus, dorsal; 286, same, ventral; 287, same, lateral; 288, tenth tergum, dorsal. *L. spirillum* Flint, McAlpine, and Ross: 289, male genitalia, lateral; 290, tenth tergum, dorsal; 291, tip of phallus, lateral; 292, same, ventral; 293, same, dorsal. *L. stigmatosum* Ulmer: 294, male genitalia, lateral; 295, tenth tergum, dorsal; 296, tip of phallus, lateral; 297, same, dorsal.

ADULT.—Length of forewing, 15-18 mm. Color pale green; forewing with fuscous hair over nygmal spots. Malar space narrow, about 1/8 height of eye. Parafacial and postocular areas about as wide as malar; postocular area with a row of 5 stout setae. Maxillary palpus with fifth segment 2/3 length of basal four segments. Processes of fifth sternum large, ovoid. *Male genitalia*: Tenth tergum with warts *a* and *b* on short stalks; lateral lobe rounded apically, ventral margin irregularly sinuate. Clasper with apical segment short, terite; basal segment 4 times as long as apical, base unmodified. Phallobase elongate, slightly angled; apicolateral surface with a row of points, dorsad of which the surface is very lightly sclerotized; *a* large, produced in lateral points directed basad; *b* developed into a uniform, reflexed, pointed process; *g* with a small apical expansion directed dorsad and pointed.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 2♀. DPTO. VALLE DEL CAUCA: Finca La Florida, Tablones, 1300 m, Jan 1959, J.F.G. Clarke, 1♂.

Family LIMNEPHILIDAE

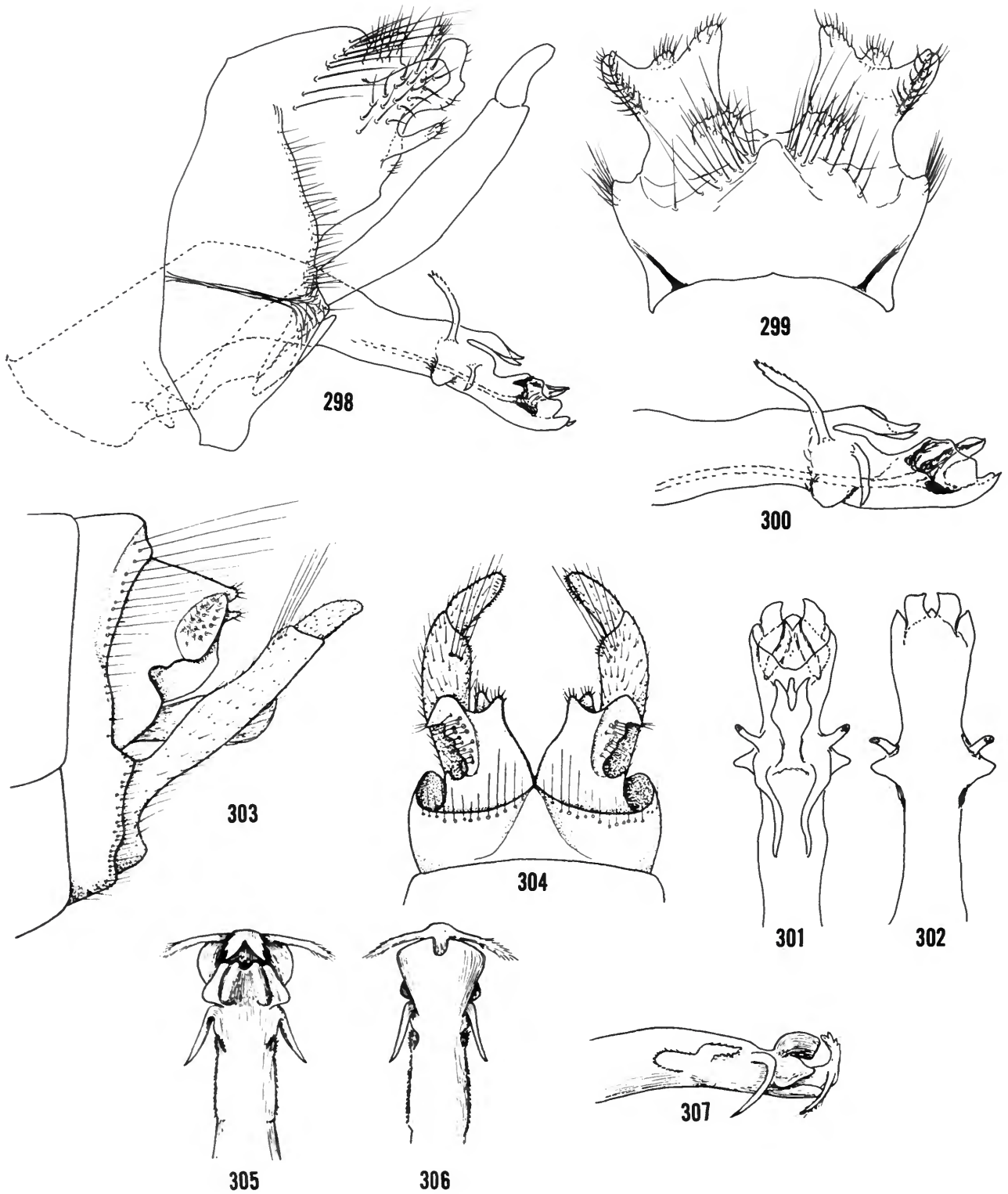
This is a large, dominant family in the northern temperate regions of the world, but generally rather depauperate in the southern. In the Patagonian area of South America it is also common and diverse with at least six genera and around 25 species described. A single genus and species is found along the high Andes from southern Peru into southern Colombia: *Magellomyia illiesi* Marlier. I have seen only a single male from Colombia (Dpto. Cauca, Nevado del Huila, 11,600', USNM). Its presence at high elevations in southern Colombia indicates that it might occur on a paramo in Antioquia, but no collections are presently available from these areas in northern Colombia.

Family LEPTOCERIDAE

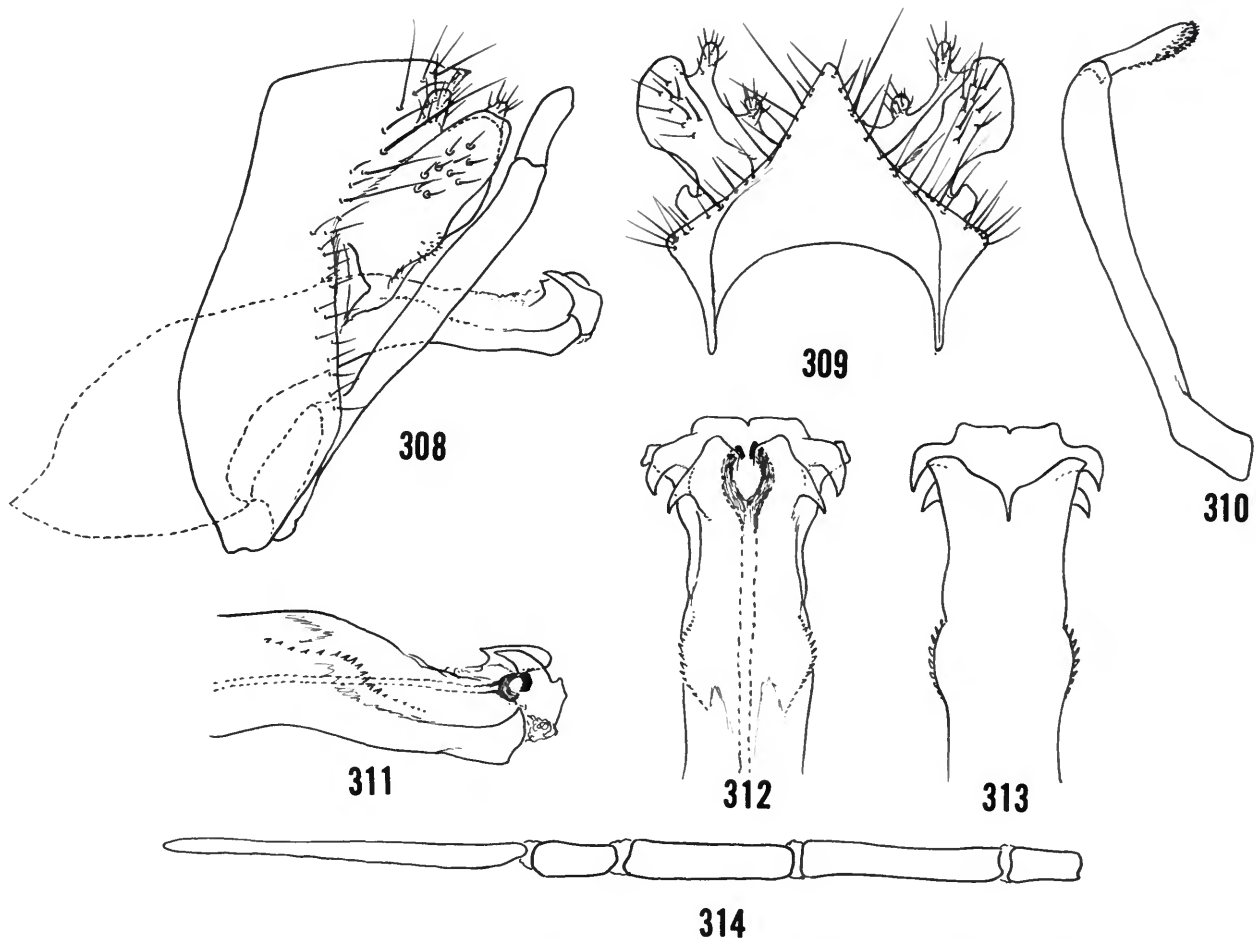
This family is found in all parts of the world where there are waters, both flowing and standing. Eight genera are here recorded from Antioquia; possibly *Achoropsyche* will yet be taken near larger, lowland rivers. The higher classification of the family has been studied recently and seems to be on a firm footing, although some problem groups still remain (Morse, 1981; Morse and Holzenthal, 1987). The larvae of this family are all cases makers, or rarely live in a case of someone else's construction. Most seem to feed on organic matter, mostly as shredders, although some may be scrapers or filterers.

Key to Antioquian Genera of Leptoceridae

1. Hindwing with 3 apparent branches of M reaching wing margin [Figure 315] . . . 2
 Hindwing with only 2 apparent branches of M reaching wing margin [Figure 319] .
 5
2. Forewing thyridial cell very long and slender, almost twice as long as discal cell
 [Figure 315] 3
 Forewing thyridial and discal cells subequal in length [Figure 317]. 4
3. Hindwing crossveins *rs* and *r-m* in line [Figure 316]. *Notalina*
 Hindwing crossvein *rs* apicad of *r-m* by at least its length [Figure 315]
 *Triplectides*
4. Anterolateral setal wart of front of head long and narrow [Figure 323].
 *Grumichella*
 Anterolateral setal wart of front of head an elongate oval, or trianguloid [Figure 324]
 *Atanotolica*
5. Forewing with stem of M atrophied [Figure 319] *Triaenodes*
 Forewing with M entire 6
6. Forewing with M apparently not branched [Figure 320] *Oecetis*
 Forewing with M obviously branched apicad 7
7. Hindwing with *Rs* and M atrophied [Figure 321] *Nectopsyche*
 Hindwing with *Rs* and M clearly present [Figure 322] *Amphoropsyche*



FIGURES 298–307.—*Leptonema tripartitum* Flint, McAlpine, and Ross: 298, male genitalia, lateral; 299, tenth tergum, dorsal; 300, tip of phallus, lateral; 301, same, dorsal; 302, same, ventral. *L. albovirens* (Walker): 303, male genitalia, lateral; 304, tenth tergum, dorsal; 305, tip of phallus, dorsal; 306, same, ventral; 307, same, lateral.



FIGURES 308-314.—*Leptonema andinum*, new species: 308, male genitalia, lateral; 309, ninth and tenth terga, dorsal; 310, clasper, posterior; 311, tip of phallus, lateral; 312, same, dorsal; 313, same, ventral; 314, maxillary palpus, lateral.

Genus *Triplectides* Kolenati

This distinctive genus is distributed throughout the Neotropical Realm from Mexico to southern Chile, but not reported from the West Indies. The genus has recently been revised (Holzenthal, 1988a), with twelve Neotropical species now recognized, of which only one is recorded from Colombia.

The larvae have been described a number of times (Correa et al., 1981; Botosaneanu and Flint, 1982; Holzenthal, 1988a). The larvae usually live in a twig in which they have bored a tunnel, but will also use a discarded case of another caddisfly. In the latter situation they add some pieces of organic matter around the mouth, sometimes extending the cases as much as the length of the original case. They apparently are shredders,

feeding on organic debris. They are primarily found in lotic habitats, generally streams of a meter or so in width.

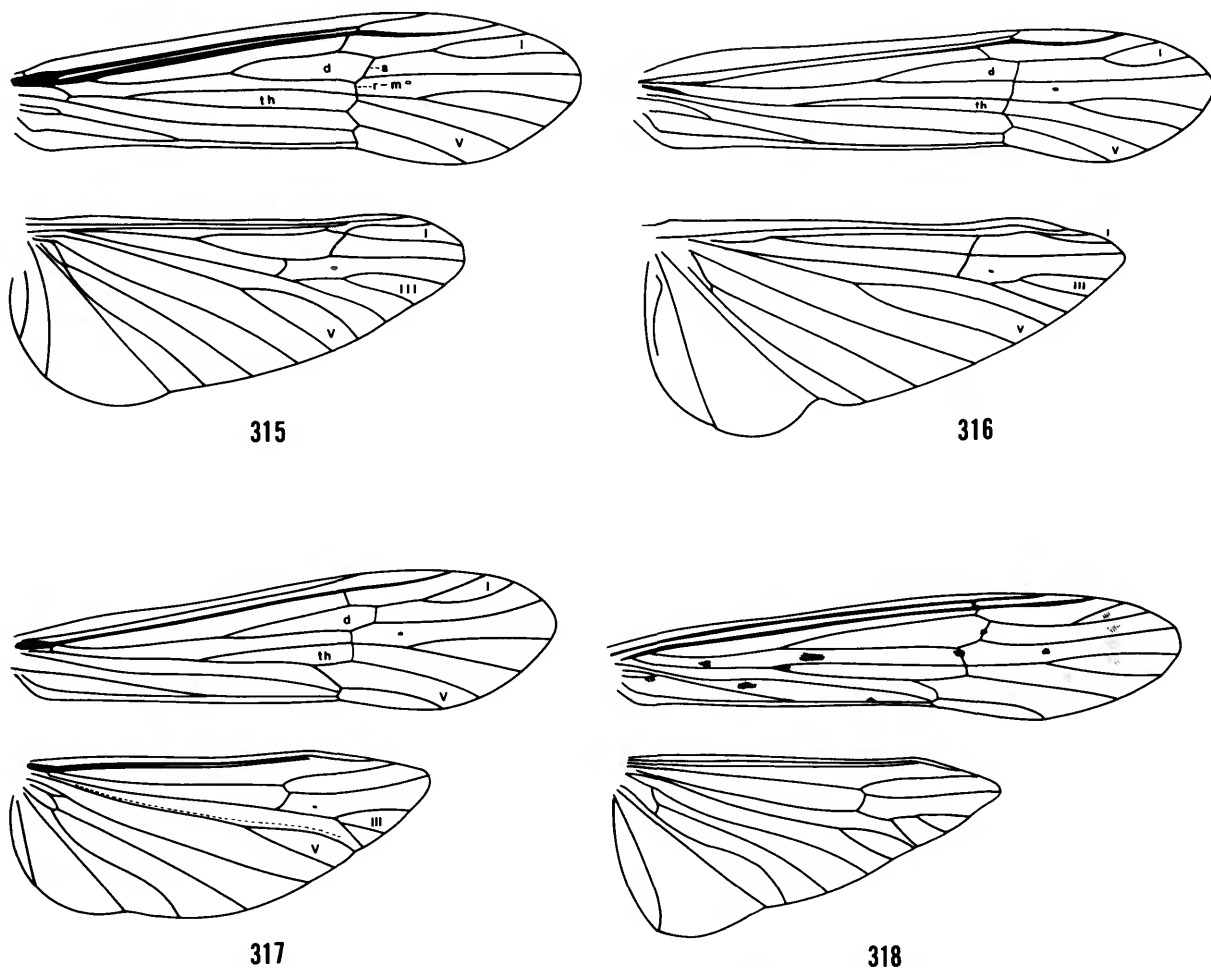
Triplectides flintorum Holzenthal

FIGURES 325-328

Triplectides flintorum Holzenthal, 1988a:193-195.

Triplectides gracilis (Burmeister).—Mosely, 1936:96 [in part, material from Central and northern South America].

This species was recently erected for the species in Central and northern South America, which had been confused with the Brazilian *T. gracilis* (Burmeister). *T. flintorum* ranges from Mexico to Ecuador, and east into Venezuela, at least. Its larvae



FIGURES 315-318.—*Triplectides gracilis* (Burmeister): 315, fore and hind wings of male. *Notalina* (*Neonotalina*) *brasiliiana* Holzenthal: 316, fore and hind wings of male. *Atanotolica aurea* Holzenthal: 317, fore and hind wings of male. *Grunichella flaveola* (Ulmer): 318, fore and hind wings of male. (I, III, V = fork designation; d, th = discoidal and thyrical cells, respectively; r-m, s = radio-medial and sectorial crossveins, respectively).

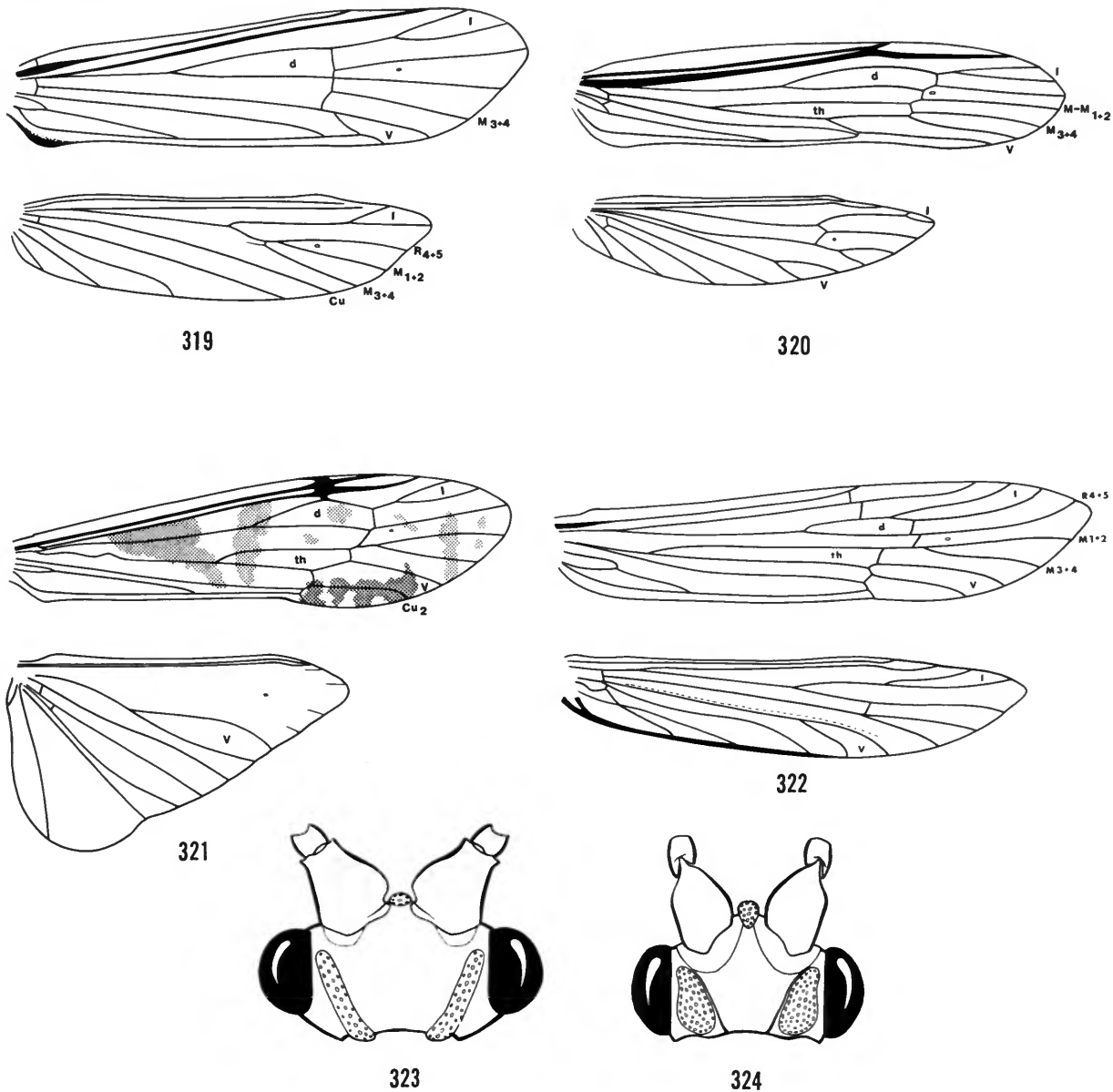
were figured by Corra et al. (1981) as *Triplectides* sp., and the *Triplectides* sp. of Botosaneanu and Flint (1982) is almost assuredly this species also.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Iguaná, 17 km NW Medellín [road to San Jerónimo], 14-15 Feb 1983, O.S. Flint, Jr., 2♂. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada La Cebolla, El Retiro (trap A), 3 Jul 1983, U. Matthias, 1♂; 21 Mar 1984, 1♀. Venecia, Jul 1943, Gallego, 1♀ (UNCM). Piedras Blancas, 10 km E Medellín [road to Guarne], Sept 1955, N. Delgado, 1♂ (UNCM). Jardín, Feb 1980, R. Vélez, 1♂ (UNCM).

Genus *Amphoropsyche* Holzenthal

This genus was recently created for a group of species known from northern and western South America (Venezuela west to Colombia and south to Bolivia) and the Lesser Antilles. Of the eleven species placed in the genus, six are known only from Colombia, four of these from Antioquia.

The larva and pupa of the Antillean species have been described (Flint, 1968b; Holzenthal, 1986a). These larvae were found in the benthos of a sandy-bottomed, mountain stream less than a meter in width. The adults have all been swept from vegetation beside streams of this nature.

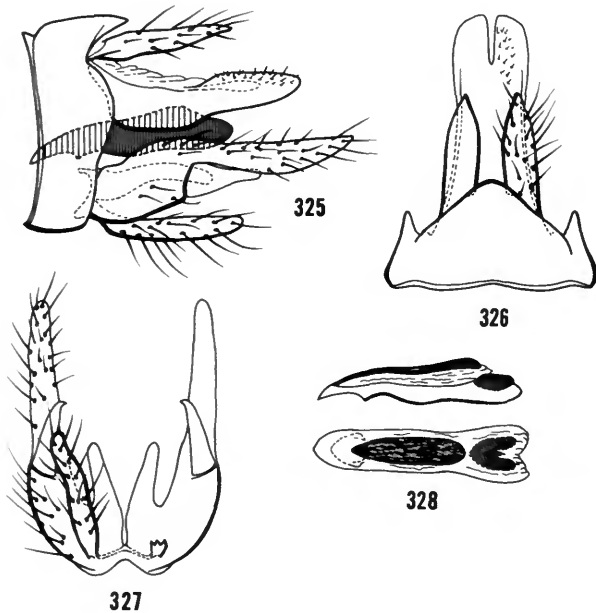


FIGURES 319-324.—*Trienodes delicatus* Navás: 319, fore and hind wings of male. *Oecetis amazonica* (Banks): 320, fore and hind wings of male. *Nectopsyche gemmoides* Flint: 321, fore and hind wings of male. *Amphoropsycha insularis* (Flint): 322, fore and hind wings of male. *Grumichella flaveola* (Ulmer): 323, head, frontal. *Atanatolica acuminata* Holzenthal: 324, head, frontal. (Labels as on previous plate, with selected veins also labelled; Cu (cubitus), M (media), R (radius), and their branches, 1, 2, 3, 4, 5).

Key to Antioquian Species of *Amphoropsycha*

1. Phallus with a basoventral spine; second segment of clasper distinctly present, oval in outline in lateral aspect; ninth segment produced anteroventrally *A. flinti* Holzenthal
- Phallus lacking ventral processes; second segment of clasper lost or small and narrow

- in lateral aspect; anterior margin of ninth segment not noticeably produced ventrally 2
2. Lateral process of tenth tergum trifold apically *A. ayura* Holzenthal
Lateral process with apex entire 3
3. Clasper with a basoventral lobe, second segment apparently lacking
. *A. cauca* Holzenthal
Clasper lacking a basoventral lobe, second segment present, roughly S-shaped . .
. *A. quebrada* Holzenthal



FIGURES 325–328.—*Triplectides flintorum* Holzenthal: 325, male genitalia, lateral; 326, ninth and tenth terga, and cerci, dorsal; 327, claspers, ventral; 328, phallus, lateral and dorsal, above and below respectively.

Amphoropsycha flinti Holzenthal

FIGURES 329–332

Amphoropsycha flinti Holzenthal, 1985:258–260.

This species was described from a unique type, but recently a second specimen has been discovered.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 27 km W Medellín [road to San Jerónimo], 23 Feb 1984, C.M. & O.S. Flint, Jr., 1♂ (holotype). DPTO. CUNDINAMARCA: Bogotá, 9,000' [~2,700 m], 16 Dec 1962, H.B. Cunningham, 1♂ (INHS).

Amphoropsycha cauca Holzenthal

FIGURES 333–336

Amphoropsycha cauca Holzenthal, 1985:268.

This species, also, is known only from the unique holotype.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 12 km N of

Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr., 1♂ (holotype).

Amphoropsycha ayura Holzenthal

FIGURES 337–340

Amphoropsycha ayura Holzenthal, 1985:264–266.

This species is known only from the 2 specimens that were taken in emergence trap B.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Ayurá, Envigado (trap B), 21 July 1983, U. Matthias, ♂ (holotype); 28 May 1983, 1♀ (paratype).

Amphoropsycha quebrada Holzenthal

FIGURES 341–344

Amphoropsycha quebrada Holzenthal, 1985:266–268.

This species was taken only in emergence trap A.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 18 Jun 1983, U. Matthias, 1♂ (holotype); 4 Aug 1983, 1♀ (paratype); 13 Oct 1983, 1♀ (paratype).

Genus *Notalina* Mosely

This genus has an interesting distribution: the typical subgenus contains 11 species all from Australia and Tasmania; the recently erected subgenus *Neonotalina* contains 7 species all from South America. The Neotropical species are known from Brazil, Peru, Venezuela, and Colombia.

Nothing is known of the immature stages of the New World species. Adults were reared from a small, high-elevation stream.

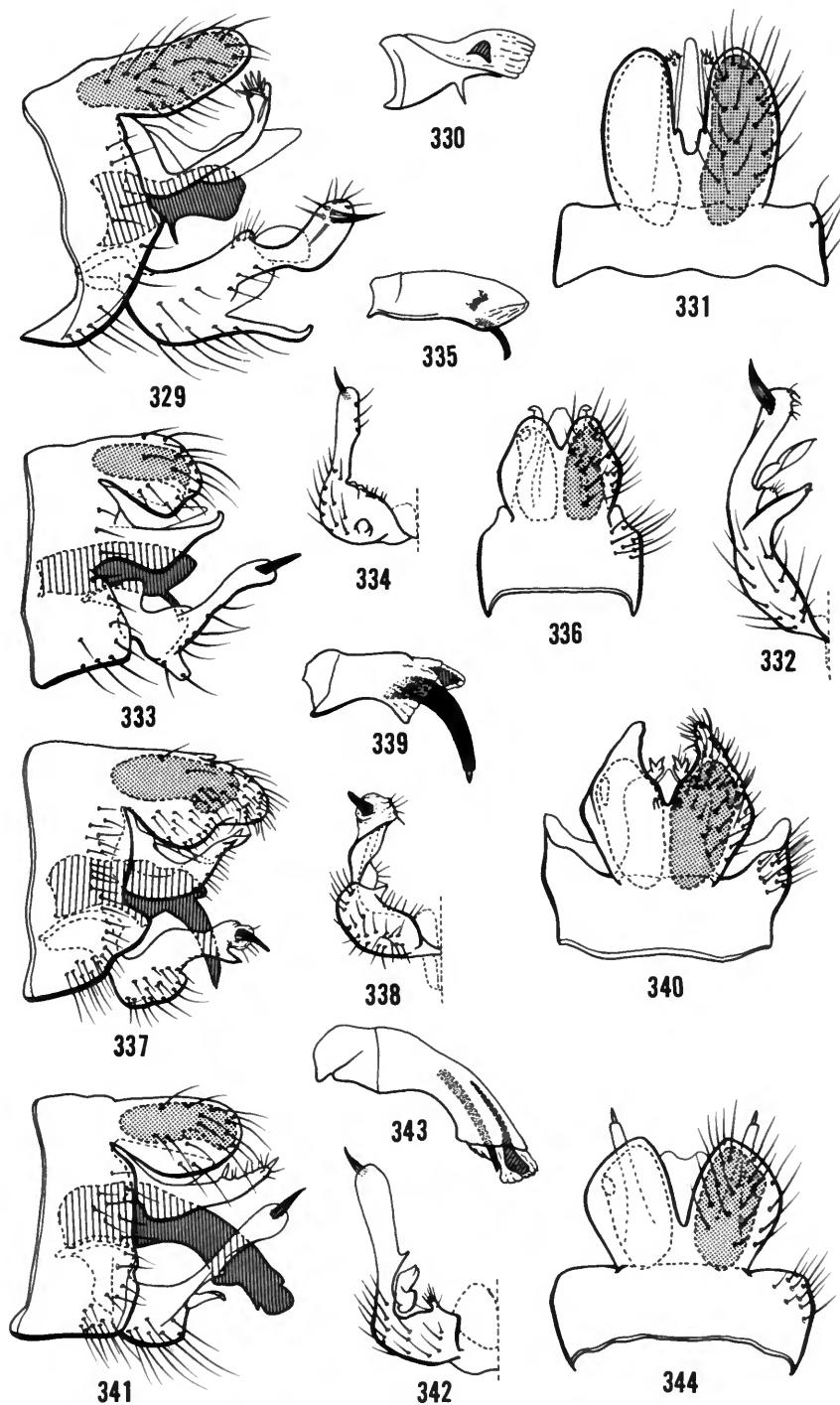
Notalina (Neonotalina) mathiasi Holzenthal

FIGURES 345–348

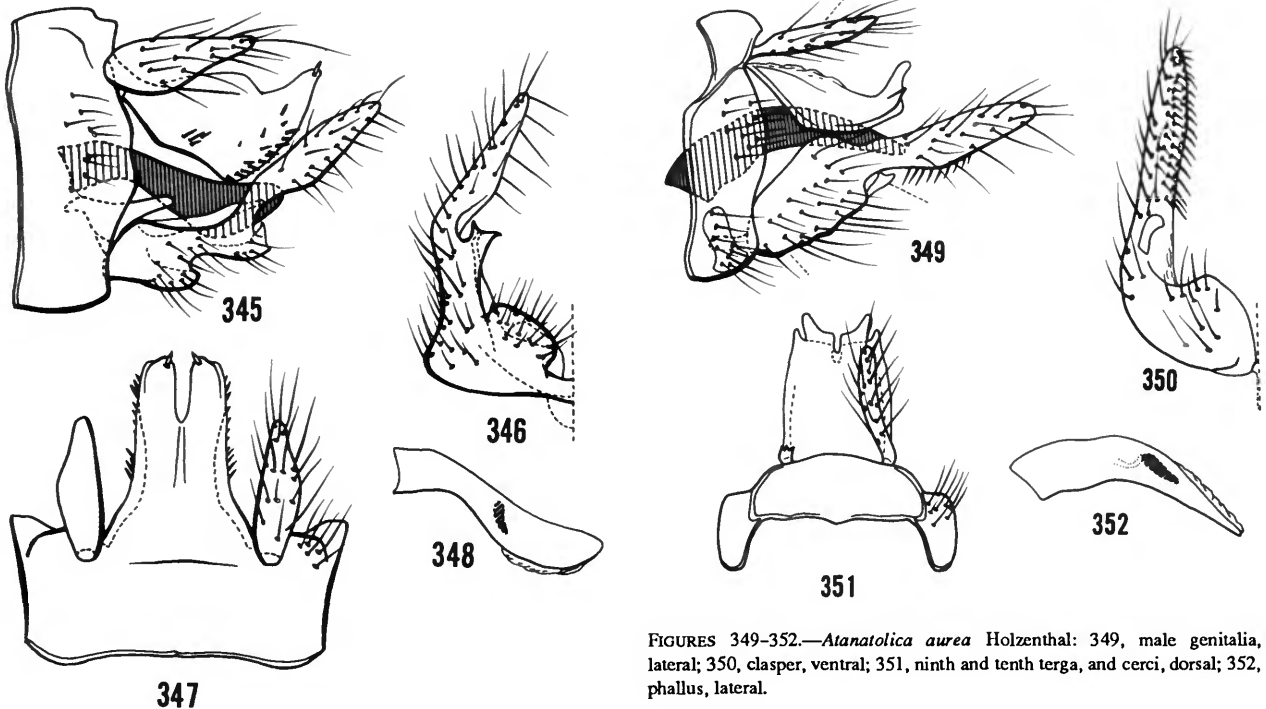
Notalina (Neonotalina) mathiasi Holzenthal, 1986b:70.

This species was described from a pair that emerged in trap A. I have recently seen another male from the Department of Boyacá.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 21 Mar 1984, U. Matthias, 1♂



FIGURES 329-344.—*Amphoropsycha flinti* Holzenthal: 329, male genitalia, lateral; 330, phallus, lateral; 331, ninth and tenth terga, dorsal; 332, clasper, ventral. *A. cauca* Holzenthal: 333, male genitalia, lateral; 334, clasper, ventral; 335, phallus, lateral; 336, ninth and tenth terga, dorsal. *A. ayura* Holzenthal: 337, male genitalia, lateral; 338, clasper, ventral; 339, phallus, lateral; 340, ninth and tenth terga, dorsal. *A. quebrada* Holzenthal: 341, male genitalia, lateral; 342, clasper, ventral; 343, phallus, lateral; 344, ninth and tenth terga, dorsal.



FIGURES 345-348.—*Notalina (Neonotalina) matthiasi* Holzenthal: 345, male genitalia, lateral; 346, clasper, ventral; 347, ninth and tenth terga, and cerci, dorsal; 348, phallus, lateral.

holotype; 13 Oct 1983, 1♀ paratype. DPTO. BOYACÁ: Igaque Wildlife Sanctuary, Quebrada San Francisco, 2,250 m, 6 May 1988, Luis E. LaRotta, 1♂.

Genus *Atanatolica* Mosely

This genus is exclusively Neotropical in distribution, being known from Costa Rica to Bolivia and the Lesser Antilles. The genus has just been revised (Holzenthal, 1988b) increasing the known species from 3 to 17.

The larvae and pupae are well known; those of several species have been described (Botosaneanu and Flint, 1982; Flint, 1968b; Holzenthal, 1988b). The larvae live in or near tumbling mountain streams. Many inhabit the wet rock surfaces beside waterfalls, on the boulders kept wet by spray from adjacent rapids. Their food has not been ascertained, but seems most likely to be organic matter scraped from the substrate.

Atanatolica aurea Holzenthal

FIGURES 317, 349-352

Atanatolica aurea Holzenthal, 1988b:77.

This species was recently described from material collected near Medellín. It is known only from Antioquia and is

FIGURES 349-352.—*Atanatolica aurea* Holzenthal: 349, male genitalia, lateral; 350, clasper, ventral; 351, ninth and tenth terga, and cerci, dorsal; 352, phallus, lateral.

commonly netted from foliage near waterfalls and cascades on the mountainsides.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: 24 km NW Medellín [road to San Jerónimo], 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♂ (holotype), 1♀ (paratype). 26 km NW Medellín [road to San Jerónimo], 23 Feb 1984, C.M. & O.S. Flint, Jr., 3♂. Quebrada La Iguaná, 17 km NW Medellín [road to San Jerónimo], 14-15 Feb 1983, O.S. Flint, Jr., 3♂. 10 km E Medellín [road to Las Palmas], 21 Feb 1984, C.M. & O.S. Flint, Jr., 2♂. 12 km E Medellín [road to Sta. Elena], 6 Feb 1983, O.S. Flint, Jr., 4♂. Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 6 Mar 1984, C.M. & O.S. Flint, Jr., 1♂.

Genus *Grumichella* Müller

This interesting genus of exclusively Neotropical distribution contains a single species in Antioquia. The genus contains at least 4 species (Holzenthal, 1988b) known from Colombia and Venezuela in the north, and in the south to northern Argentina.

The larvae have a very unusual morphology that has been described a number of times (Müller 1880, 1881; Thienemann, 1909; Roback, 1966; Correa et al., 1981; Holzenthal, 1988b). The immature stages are found on the upper surfaces of large rocks and boulders in very fast streams and rivers. They construct slightly curved and tapered cases made wholly of silk, or rarely of sand grains. Their food habits have not been investigated, but the shape of their mandibles suggests that they graze on periphyton.

***Grumichella flaveola* (Ulmer)**

FIGURES 318, 323, 353-356

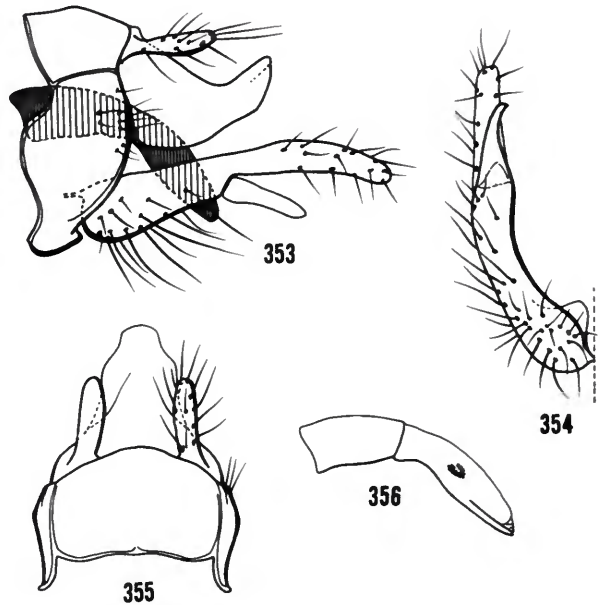
Leptocelodes flaveola Ulmer, 1911:22.—Fischer, 1966:9.
Grumichella flaveola (Ulmer)—Holzenthal, 1988b:91-93.
 Unknown family 2 Roback, 1966:256, 303.
Grumichella sp. Correa et al., 1981:45.

This species is wide-ranging over the Andean area of South America: Argentina, Bolivia, Peru, Ecuador, Colombia, and Venezuela. The larvae of this species were described by Correa et al. (1981), Holzenthal (1988b), and Roback (1966). They are found in fast flowing, clean rivers and streams.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Río Medellín, 6 km S Caldas, 24 Feb 1984, C.M. & O.S. Flint, Jr., 1♂, 8♀. Río Aurrá, km 50, E. San Jerónimo, 22 Feb 1984, C.M. & O.S. Flint, Jr., 4♀; same, but 14 Feb 1983, O.S. Flint, Jr., 1♀. San Andres, en Barbechos, May 1952, Gallego, 2♂ (UNCM). The species is also known from the Departments of Risaralda and Santander in Colombia.

Genus *Nectopsyche* Müller

This is a very large genus of around 50 described species, all limited to the New World. Species are found from Canada to southern Chile, including some of the Greater Antillean islands, but none of the Lesser Antilles. The greatest diversity and number of species are found in the South American lowlands. The larvae of a number of the North and South American species have been described (Correa, et al., 1981; Haddock, 1977; Marlier, 1964; Wiggins, 1977). They construct elongate cases, some of small sand grains, others of plant



FIGURES 353-356.—*Grumichella flaveola* (Ulmer): 353, male genitalia, lateral; 354, clasper, ventral; 355, ninth and tenth terga, and cerci, dorsal; 356, phallus, lateral.

material, sometimes rather irregularly arranged. Different species inhabit very different habitats, from small mountain streams to backwaters on large rivers and lakes. The larvae are classified as shredders or collectors, feeding on various types of organic matter in the environment.

Key to Antioquian Species of *Nectopsyche*

1. Forewing golden, marked with silver transverse bars and black eye-spots along posterior margin 2
- Forewing either blackish with a white band or white mottled with various shades of brown 3
2. Male genitalia lacking periphallic process; basoventral process of clasper broad, often as broad as long *N. gemma* (Müller)
- Periphallic process present, slender, not enlarged apicad; basoventral process terete, much longer than broad *N. argentata*, new species
3. Forewing nearly uniformly brownish-black with a white band along posterior margin *N. dorsalis* (Banks)
- Forewing white with many irregular transverse marks of various shades of brown *N. punctata* (Ulmer)

***Nectopsyche dorsalis* (Banks)**

FIGURE 409

Leptocella dorsalis Banks, 1901:368.—Haddock, 1977:408-410.—Flint, 1981a:34.

The species is widely distributed from the south-western United States south to Venezuela on the east and Colombia on

the south.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 7♀; same, but 3-4 Mar 1984, C.M. & O.S. Flint, Jr., 4♀. Alejandría, Apr 1972, R. Vélez, 1♂ (UNMC); Feb 1973, 2♂ (UNMC).

Nectopsyche punctata (Ulmer)

FIGURE 410

Leptocella punctata Ulmer, 1905b:75.—Fischer, 1966:60.—Flint, 1981a:34.

This species is also widely distributed in the neotropics, being known from central Mexico south to central Argentina, in both lowland and upland areas (see Fischer 1966 for full bibliography). The species varies considerably in the details of the forewing marking, resulting in a number of synonyms (Flint, 1981a).

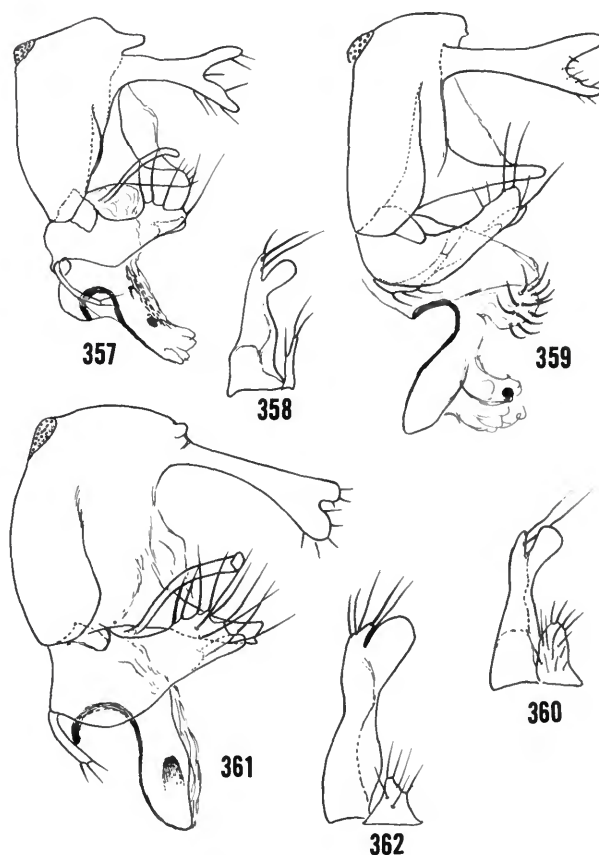
MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Agudelo, 2 km E El Retiro, 8 Feb 1983, O.S. Flint, Jr., 1♂, 1♀. Quebrada Potreros, W La Fé, 19 Feb 1984, C.M. & O.S. Flint, Jr., 1♀. Quebrada La Mosca, 2 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 1♀. Río Medellín, 5 km S Caldas, 16 Feb 1983, O.S. Flint, Jr., 1♂; same, but 6 km S Caldas, 24 Feb 1984, C.M. & O.S. Flint, Jr., 3♂, 1♀; same, but Estación Primavera, above Caldas, 1600 m, 30 Aug 1983, U. Matthias, 2♂. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 3–4 Mar 1984, C.M. & O.S. Flint, Jr., 1♂, 1♀. Alejandría, Feb 1972, R. Vélez, 1♂ (UNCM). Valle Medellín, July 1951, Gallego, 2♂ (UNCM). The species is also known from the Departments of Amazonas, Cauquetá, Chocó, and Meta in Colombia.

Nectopsyche argentata, new species

FIGURES 357, 358, 411

This species belongs to the *gemma* group, and is closest to *N. gemma* (Müller) itself. In coloration these species are virtually indistinguishable, but *N. gemma* tends to have several longitudinal bands of white hair in cells between the eye-spots and the anterior margin of the forewing. In the male genitalia, the phallus lacks the periphallic processes in *N. gemma* that are clearly present, although small, in *N. argentata*. The basoventral processes of the clasper are generally digitate in *N. argentata*, but much broader, sometimes being as broad as long, in *N. gemma*; however, they are occasionally of the same size in the two species. I place two females from Mexico in *N. argentata*, which they match perfectly in maculation. Unfortunately, we have no males from Mexico which would substantiate this placement, although the presence of the species in Costa Rica is supportive.

ADULT.—Length of forewing, male 7–8 mm, female 6–7 mm. Color golden yellow marked with silver, white and black; head mostly golden with white hair around eyes, mesally on vertex and dorsally on antennae; thorax mostly golden with 2 longitudinal white lines on each side of mesonotum; forewing golden yellow marked with silver iridescent lines, and 4 black ocellate spots on posteroapical margin which are banded inwardly by white scales. Eyes of male small, in ventral aspect slightly less than half as wide as interocular distance. **Male genitalia:** Ninth segment with a small dorsomesal lobe; dorsomesal arms deeply forked apicad. Tenth tergite elongate,



FIGURES 357–362.—*Nectopsyche argentata*, new species: 357, male genitalia, lateral; 358, clasper, ventral. *N. gemma* (Müller): 359, male genitalia, lateral; 360, clasper, ventral. *N. species*: 361, male genitalia, lateral; 362, clasper, ventral.

tip obliquely truncate. Clasper with ventral margin angulate, tip with a spatulate apicomeres lobe; basoventral process elongate, terite, with a few setae (rarely up to twice as wide as shown, then with several more setae). Phallus with periphallic processes small, not greatly modified apically; with ventral plate, internal sclerite, and a band of small spines.

MATERIAL.—**Holotype**, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 3–4 Mar 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 2♀. Quebrada La Mosca, 2 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 1♀. VENEZUELA. EDO. ZULIA: El Tucuco [45 km SW Muchiques], 5–6 Jun 1976, Menke and Vincent, 1♂, 1♀. EDO. BARINAS: Barinitas, 22–26 Feb 1969, Spangler, Duckworth, and Dietz, 2♂; same, but 15 km SW Barinitas, 25 Feb 1969, 1♀. Río Sto. Domingo, Barinas, 17 Feb 1976, C.M. & O.S. Flint, Jr., 5♂. COSTA RICA. PCIA. GUANACASTE: Parque Nacional Guanacaste, Maritza, Río Tempisque, 10.958°N, 85.497°W, 550 m, 17–18 Jun 1988, C.M. & O.S. Flint, Jr., and Holzenthal, 11♂; same, but Est. Mengo, Río San Josecito,

10.922°N, 85.470°W, 960 m, 28–29 Jul 1987, Holzenthal, Morse, and Clausen, 6♀. Parque Nacional Rincón de la Vieja, Río Negro, 10.765°N, 85.313°W, 810 m, 3 Mar 1986, Holzenthal and Fasth, 2♂, 1♀. PCIA. PUNTARENAS: Río Bellavista, ~1.5 km NW Las Alturas, 8.951°N, 82.846°W, 1400 m, 8–9 Apr 1987, Holzenthal, Hamilton, and Heyne, 6♂; same, but 2–3 Aug 1987, Holzenthal, Morse, and Clausen, 2♀; same, but 18 Feb 1986, Holzenthal, Morse, and Fasth, 5♀. Río Cotón in Las Alturas, 8.938°N, 82.826°W, 1360 m, 16 Feb 1986, Holzenthal, Morse, and Fasth, 2♂. PCIA. ALAJUELA: Cerro Campana, Río Bochinche, tributary, 6 km (air) NW Dos Ríos, 10.645°N, 85.413°W, 600 m, 15–16 Mar 1986, Holzenthal and Fasth, 1♂; same, but 22–23 July 1987, Holzenthal, Morse, and Clausen, 1♂.

OTHER—MEXICO. EDO. VERACRUZ: near Huatusco, 25–26 Jul 1965, Flint and Ortiz, 2♀.

Nectopsyche gemma (Müller)

FIGURES 359, 360, 412

Setodes gemma Müller, 1880:110–111, 130.

Leptocella gemma (Müller).—Fischer, 1966:56.

Leptocella festiva Navás, 1913:76–77 [new synonymy].

This species, the type of *Nectopsyche*, has never been adequately defined. Although the name has been used many times (see Fischer for a complete bibliography), it is clear that a number of species have been mixed under this name. Extensive collections from many regions of South America show that there is a large number of very similar species contained in this group. The species I figured and described as *N. gemma* from Surinam (Flint, 1974d:129) is another of these undescribed species. To help stabilize the nomenclature, I am here designating and figuring a neotype of this species. Banks (1920) mentions that the MCZ contains a set of Müller's species sent by him to Dr. Hagen, and I am selecting the male in this series as the neotype.

The basic color is a pale, yellowy-orange, marked with longitudinal silvery bands basally, 2 obliquely transverse silver bands, a cluster of 4 black spots at the posteroapical angle which are set in white and silver hairs and scales; the cells along the chord are variably filled with white hair and with some black marks; apically there are 2 crossbands (inner of which may be broken into spots) of silver hair. The mesothorax laterally bears 2 pairs of silvery bands, and the head has silver hair along the eye and mesally on the vertex. The eye of the male is quite small, being only about 1/2 the width of the interocular distance in ventral aspect. The genitalia of the neotype is here figured.

The distribution of the species is somewhat perplexing. I only know the species in Brazil from the type series. What appears to be an identical form in nearby Argentina (Misiones) and Paraguay, differs genitally in lacking the cluster of spines in the phallus. The type form reappears again in the Andes. I have examples of this from the Andes of northwestern

Argentina, Bolivia, Ecuador, Colombia, Venezuela, and northern Panama. I have compared the types of *Leptocella festiva* Navás to the female from Quebrada Potreros, Antioquia. The type is almost wholly denuded, but the remaining scales and marks are a perfect match with the Colombian specimens. I am therefore synonymizing *L. festiva* with *L. gemma*.

Neotype, Male. "Brazil. [Sta. Catarina], Itajahy, F. Müller." "Type 11112 [MCZ]." "Neotype *Setodes gemma* Müller, O.S. Flint, Jr. [19]88."

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Potreros, W La Fé, 26 Feb 1984, C.M. & O.S. Flint, Jr., 1♂, 1♀. Quebrada La Mosca, 2 km W Guarne, 2 Mar 1984, C.M. & O.S. Flint, Jr., 2♀. Río Medellín, 6 km S Caldas, 24 Feb 1984, C.M. & O.S. Flint, Jr., 1♀. I also have seen examples from the Department of Cauca in Colombia, and Argentina, Bolivia, Brazil, Ecuador, Panama, and Venezuela.

Nectopsyche species

FIGURES 361, 362

This material, taken in the emergence traps, is apparently a third species of the *gemma* group to be found in Antioquia. It is immediately recognized by the males having very large eyes; in ventral aspect each eye is as wide as the interocular distance. I am unable to find any other males of the group with such large eyes. All the material is in alcohol and thus the color pattern cannot be described in detail. The dark marks in the membrane of the one well-marked male are apparently the same as found in either of the two other regional species. However, the smaller basal and other marks do not produce these dark membrane marks, and so the pattern is unknown in detail. The male genitalia also differ from that of the other two species. However, lacking a pinned male in good condition, I prefer to leave the species unnamed.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 21 May–1 Dec 1983, U. Matthias, 1♂, 4♀. Quebrada La Ayurá, Envigado (trap B), 6 Aug 1983, U. Matthias, 1♂.

Genus *Triaenodes* McLachlan

As presently constituted the genus is world-wide in distribution. In the Neotropical Region the genus is quite uncommon and limited in distribution to Mexico, Central America, and northern South America. A single species was described from Colombia (Ulmer, 1909b), but has never been found again. It is believed (K. Manuel, pers. comm.) that the type was mislabelled, as the genitalia appear more like species in the Old World species groups than anything known from the New World. All the other species (mostly undescribed) from the Neotropics belong to a very distinctive species group, limited to the region.

The larvae of many species from the northern hemisphere and Africa have been described (Corallini-Sorcetti and Moretti, 1984; Hickin, 1967; Wiggins, 1977) but none of the Neotropi-

cal species are known in their immature stages. Food studies indicate that most larvae ingest living plant tissues (Manuel and Braatz, 1984; Wiggins, 1977). The larval cases are constructed of small pieces of plant arranged in a spiral. They are also noted for using their fringed hind legs to swim with their cases. They inhabit lakes and slowly flowing stretches of streams and rivers, generally areas with abundant rooted vegetation. Adults of Neotropical species are found near small spring-fed streams and may differ significantly in habits and case construction from species in other regions.

***Triaenodes abruptus*, new species**

FIGURE 363

This is the third species to be described in the genus from the Neotropical region. Many more species from Mexico to Ecuador await description (K. Manuel, pers. comm.), all very similar in structure to the three described species. From its described congeners, *T. anomalus* Flint and *T. delicatus* Navás, *T. abruptus* differs in having its cercus short and broad, the tenth tergum bears a short, erect basal process, its tip is pointed, and at midlength the dorsal margin is indented.

ADULT.—Length of forewing, 6 mm. Color in alcohol, uniformly pale brown. *Male genitalia*: Ninth segment with anterior margin nearly vertical; posteroventral margin slightly produced posteriad, articulating broadly with base of clasper. Cercus short, about as long as broad. Tenth tergum with an erect, conical, dorsomesal process; dorsal margin transversely indented at midlength; apex pointed in lateral aspect. Clasper with basodorsal margin rugose, with a thin, elongate, narrow, dorsolateral process; apex tapered to a sharp point; from base a heavily sclerotized dorsomesal process whose tip is angled ventrad and pointed. Phallus with a broad, truncate mesal portion and a pair of lateral processes, sclerotized apicad.

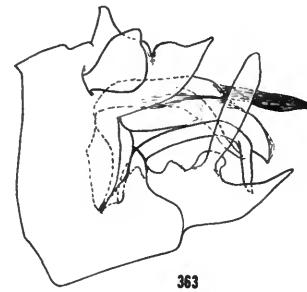


FIGURE 363.—*Triaenodes abruptus*, new species: 363, male genitalia, lateral.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Ayurá, Envigado (trap B), 13 Jul 1983, U. Mathias. USNM Type.

Paratypes: Same data as holotype, but Apr–Dec 1983, 6♂, 9♀.

Genus *Oecetis* McLachlan

This genus is found in all regions of the world and is especially speciose in tropical areas. Numerous species, including many undescribed ones, are known from the Neotropical region. The larvae of many north temperate species have been described (Ross, 1944; Hickin, 1967) and a Colombian example of *O. avara* was described by Correa et al. (1981). The larvae are apparently more strongly predatory than most genera of the family (Winterbourn, 1971) although some are plant feeders (Balduf, 1939). Larval case structure is very diverse, some being regularly tapered and curved, made of small sand grains, and others rather irregularly cylindrical from plant fragments, and a few very fuzzy in appearance from transversely placed small sticks. They live in both lotic and lentic habitats, depending on the species, some even reported from brackish water (Lepneva, 1971).

Key to Antioquian Species of *Oecetis*

1. Forewing blackish-brown, without spots, but with a transverse dark band along chord *O. inconspicua* (Walker)
Forewing pale brown, with distinct dark spots on bifurcations of veins and frequently along wing margin 2
2. Clasper of male broad in lateral aspect, posterior margin smooth with a small posteroventral lobe *O. avara* (Banks)
Clasper narrow, posterior margin bearing several lobes and processes tipped by enlarged setae *O. knutsoni* Flint

***Oecetis avara* (Banks)**

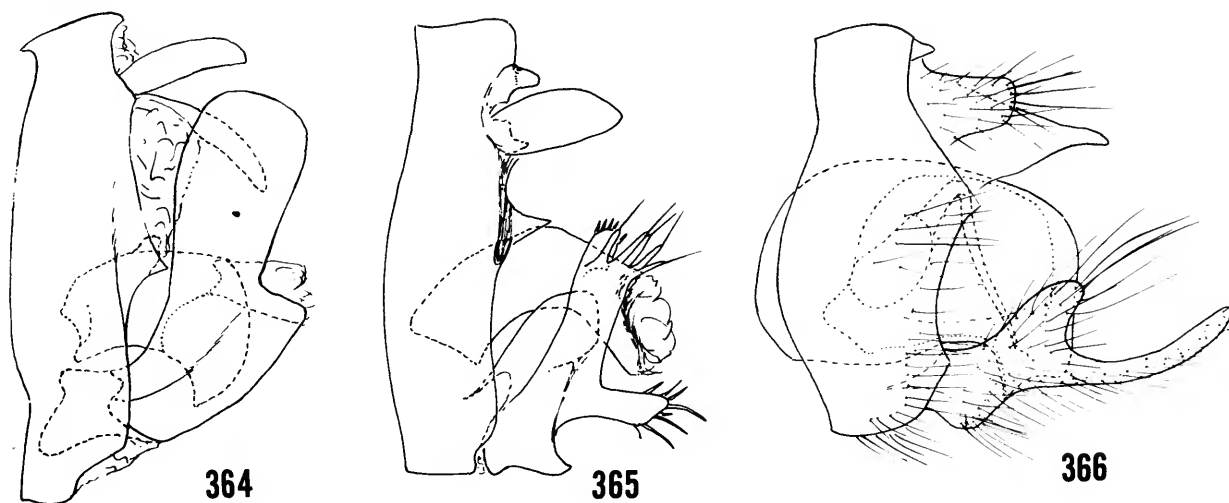
FIGURE 364

Setodes avara Banks, 1895:316.
Oecetis (Oecetodes) avara (Banks).—Fischer, 1966:153–154; 1972b:150.
Oecetis avara (Banks).—Bucno-Soria and Flint, 1978:213.—Smith and Lehmkuhl, 1980:641–643.—Bucno-Soria, 1981:111.

This species is widely distributed in the New World, from

Canada to Ecuador and Venezuela, at least, but has not been collected frequently in Antioquia. Correa et al. (1981) illustrated the larva of a species of *Oecetis* identified as *O. avara*. Now that *O. knutsoni* Flint is also known from the region, and appears to be much more common, it is possible that this record pertains to larvae of *O. knutsoni*.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983,



FIGURES 364–366.—*Oecetis avara* (Banks): 364, male genitalia, lateral. *O. knutsoni* Flint: 365, male genitalia, lateral. *O. inconspicua* (Walker): 366, male genitalia, lateral.

O.S. Flint, Jr., 2♂, 1♀. DPTO. TOLIMA: Armero, near Guyabal, 2–10 Feb 1977, E.L. Peyton, malaise trap, 90♂, 82♀

Oecetis knutsoni Flint

FIGURE 365

Oecetis knutsoni Flint, 1981a:32.

This species was described from Venezuela and is here recorded from Colombia. In addition, I have seen examples from Bolivia. It appears to be rather common in the fast flowing rivers and streams of the Andes. It is quite possible that the larva ascribed to *O. avara* (Banks) by Correa is actually that of *O. knutsoni* which is much more common in the region.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Mosca, 1 km W Guarne, 7 Feb 1983, O.S. Flint, Jr., 5♂, 1♀; same, but 2 Mar 1984, C.M. & O.S. Flint, Jr., 17♂, 7♀. 10 km E Medellín [road to Guarne], 7 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada La Agudelo, 2 km E El Retiro, 8 Feb 1983, O.S. Flint, Jr., 2♂; same, but 25 Feb 1984, C.M. & O.S. Flint, Jr., 11♂, 1♀. Río Medellín, 5 km S Caldas, 16 Feb 1983, O.S. Flint, Jr., 7♂, 2♀; same, but 6 km S Caldas, 24 Feb 1984, C.M. & O.S. Flint, Jr., 3♂; same, but Estación Primavera above Caldas, 1600 m, 30 Aug 1983, U. Matthias, 3♂. Quebrada El Retiro, 16 km NW Medellín [road to San Pedro], 20 Feb 1984, C.M. & O.S. Flint, Jr., 1♂, 1♀. Quebrada La Cebolla, El Retiro (trap A), 21 May 1983, U. Matthias, 2♀; Feb 1984, 1♀. Quebrada La Ayurá, Envigado (trap B), 13 Oct 1983, U. Matthias, 1♂; 3 Nov 1983, 1♀.

Oecetis inconspicua (Walker)

FIGURE 366

Leptocerus inconspicuus Walker, 1852:71.

Oecetis inconspicua (Walker).—Flint 1964b:64; 1981a:33.—Fischer, 1966:149; 1972b:32.—Bueno-Soria and Flint, 1978:213.

This is a very widespread species found from Canada south through Central America and the Greater Antilles, to Colombia and Venezuela. The species has an extensive bibliography and synonymy for which one should consult the Fischer references. The larvae were described by Ross (1944). They apparently live in all sorts of aquatic situations from lentic to lotic, but probably not in the most turbulent sections of small streams.

No males were taken in Antioquia, but the females match females in other series in maculation and genitalia.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Río Medellín, 5 km S Caldas, 16 Feb 1983, O.S. Flint, Jr., 2♀. I have examples, including males, from the Departments of Meta and Tolima in Colombia.

Oecetis species

A single female of an unknown species was taken in emergence trap A. The wing markings look identical to those of *O. knutsoni* Flint, but the genitalia are very different. The genitalia are quite similar to those ascribed to *O. prolongata* Flint (Flint, 1981a, Fig. 151). There are, however, enough differences to show that the two species are distinct although closely related.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), Oct 1983, U. Matthias, 1♀.

Family CALAMOCERATIDAE

Although representatives of this family are found in most areas of the world, they are primarily a tropical group. Even here, however, they are not very diverse. The genus *Phylloicus* is nearly ubiquitous throughout the Neotropical Region, and the genus *Banyallarga* is widespread throughout the Andean Mountains from Venezuela to Argentina. Although this latter genus has not yet been found in Antioquia, it most probably

will be found in some small, spring-fed stream with more collecting.

The larvae all construct cases, generally flattened and cut from large leaf fragments. Larvae of some species of *Banyallarga* construct more rounded cases of small rock fragments (Flint and Angrisano, 1985).

Genus *Phylloicus* Müller

This genus is found throughout the Neotropical Region, being known from the southwestern United States southward to southern South America, including the Greater and Lesser

Antilles and the Chilean subregion. About 25 species have been named, but many more are yet to be described.

The larvae and cases are well known (Correa et al., 1981; Flint, 1968b; Wiggins, 1977). The larval cases are flat and constructed of large leaf fragments, one or more on the dorsal surface and a similar number beneath. Most species are found in accumulations of organic debris in backwaters of brooks, streams, and small pools. One species inhabits the water found between leaves in the base of arboreal bromeliads. They are considered to be shredders of large organic matter (Wiggins, 1984).

Key to Antioquian Species of *Phylloicus*

- Forewing brown, sometimes with a paler fleck over the chord *P. angustior* Ulmer
 Forewing fuscous, with 2, curved transverse white bands and several short, longitudinal, white marks basally *P. elegans* Hogue and Denning

Phylloicus angustior Ulmer

FIGURE 367

Phylloicus angustior Ulmer, 1905b:78.—Fischer, 1965:21.—Flint, 1981a:36.

This is the most frequently encountered South American species of the genus. Examples have been seen from Argentina, Brazil, Bolivia, Peru, and Venezuela, in addition to Colombia. The larvae and cases have been described from Venezuelan examples (Thienemann, 1909).

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: [Santa Fé de] Antioquia, May 1954, N. Delgado, 1♂ (UNCM). Medellín, 24 Jan 1960, Gallego, 1♀.

Phylloicus elegans Hogue and Denning

FIGURES 368, 369

Phylloicus elegans Hogue and Denning, in Denning, Resh, and Hogue, 1983:184.

This species was recently described from Panama, and additional examples have been seen from Costa Rica, Nicaragua, and now Colombia. These examples from Colombia seem identical in terms of coloration and male genitalia to Panamanian topotypes. They differ slightly in the structure of the pheromone glands dorsolaterally on the fourth tergum. In the Central American examples the lateral sclerotized plate is relatively broad and projects well beyond the posterior margin of tergum 4, and the lateral and posterior margins are also darkly margined. In the Colombian examples this sclerotized plate is noticeably shorter and more pointed apicad in lateral aspect, the posterior and lateral margins are not margined but the midline is. The coloration of the species has not been

described previously; it is identical to that of *P. liuratus* Banks. The body is mostly yellow-orange, with the legs, palpi, and antennae infusate apically. The head and thorax dorsally are also infusate. The wings are fuscous with cream colored marks: 2 short longitudinal stripes in the anal region basally, a transverse band which is angled posteriad from near anterior margin (an obliquely formed V mark), and a crescentic subapical band.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 22 Feb 1983, O.S. Flint, Jr., 4♂, 2♀. Quebrada La Jiménez, Sopetrán (trap C), 22 May 1983, U. Matthias, 1♂.

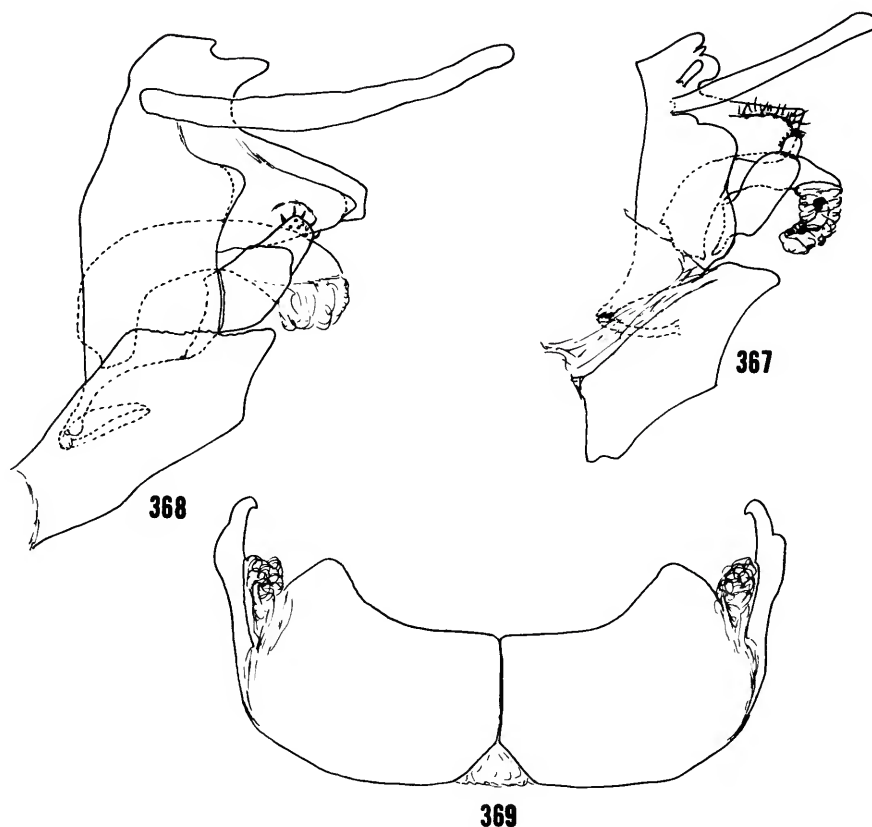
Phylloicus species 1

FIGURE 370

This is apparently an undescribed species. Unfortunately, only a single alcoholic specimen, which is quite teneral, is known. There is no indication of the coloration of the species. Because color is so important in this genus, I prefer not to describe it until a well-marked, pinned male is available.

The abdomen and genitalia seem quite distinctive. There is no modification of any abdominal tergum. The base of hind wing bears a fringe of long hairs along the posterior margin which, when the wings are closed, looks like a hair-pencil. The eighth sternum is produced posteriad, but as a mesal, tongue-like extension that is not divided mesally. The remainder of the genitalia are typical of the genus, but do offer a number of distinctive characteristics.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), 21 May 1983, U. Matthias, 1♂.



FIGURES 367-369.—*Phylloicus angustior* Ulmer: 367, male genitalia, lateral. *P. elegans* Hogue and Denning: 368, male genitalia, lateral; 369, male fourth tergum, dorsal.

Phylloicus species 2

FIGURES 371, 372

Together with *Phylloicus* species 1, this species is only known from alcoholic examples. Although many are fully hardened, it is impossible to be certain of the color pattern. They appear to be nearly uniformly dark brown, certainly without strongly contrasting marks, but subtle shadings would not be discernable in the material. The forewing length is 10–11 mm. Until good, pinned males are available, I leave this species unnamed.

The fourth abdominal tergum is strongly modified, with the posterolateral process containing dark internal sacs which almost certainly are eversible. The hindwing bears a scent-brush of long, widened hairs in a basal pocket. There is no modification of the eighth sternum. The species would appear to be closely related to the Peruvian *P. spectabilis* Martynov. It differs in having slender cerci, rather than broadly flattened ones as in *P. spectabilis*. There appear to be some differences in the fourth tergal processes between the two species in spite of

their overall similarity.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Ayurá, Envigado (trap B), Apr 1983–Mar 1984, U. Matthias, 7♂, 12♀.

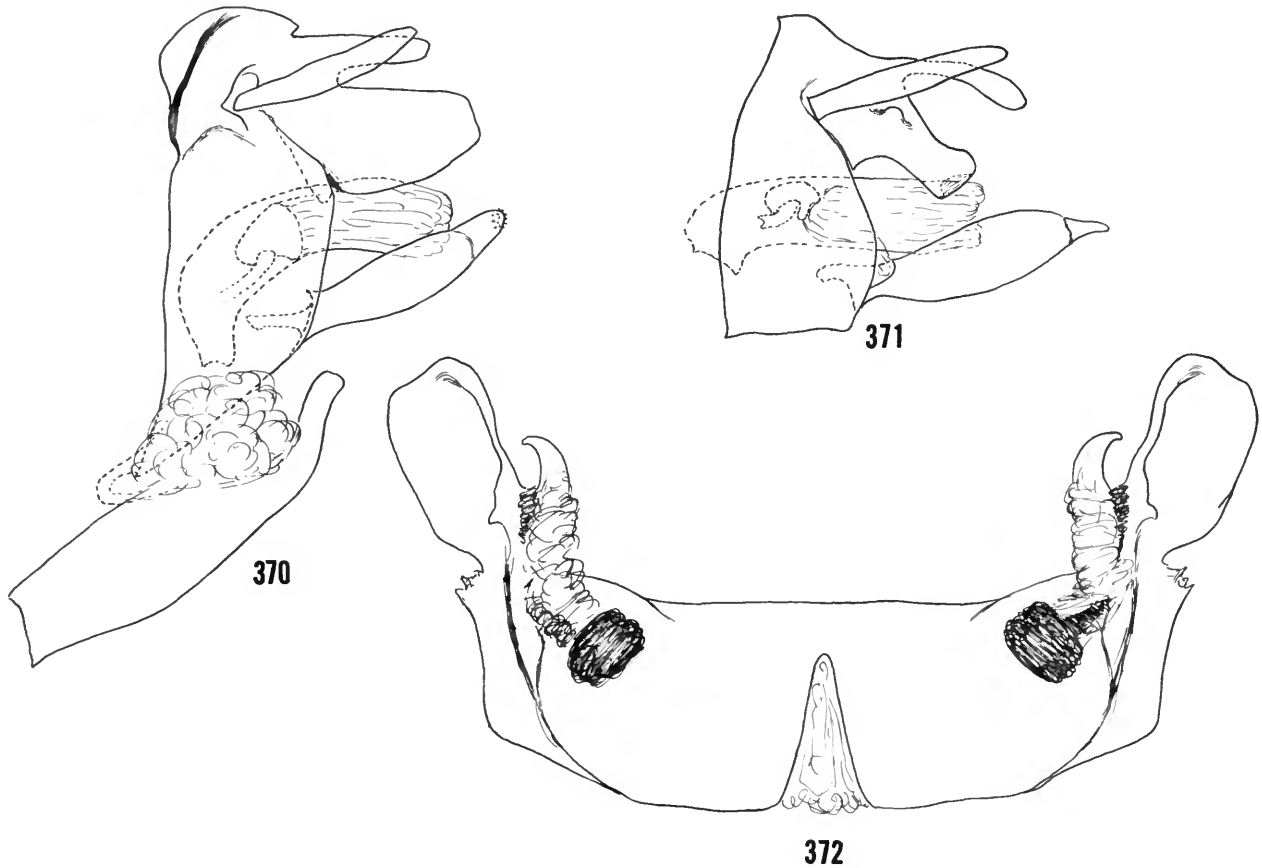
Family ODONTOCERIDAE

This family has a distributional pattern quite similar to that of the calamoceratids, but is lacking in Africa, and has a better representation in temperate areas. Only a single genus is known from, or is likely to occur in, Colombia.

The larvae are all case-makers. They produce strong, tubular cases made of sand grains. They inhabit flowing waters of all sizes, and are usually buried in the sandy substrate.

Genus *Marilia* Müller

This is a widespread genus with species known from Asia and Australia in the Old World, and from Canada to Argentina, including the Greater Antilles, in the New World. Many of the



FIGURES 370-372.—*Phylloicus* species 1: 370, male genitalia, lateral. *P.* species 2: 371, male genitalia, lateral; 372, male fourth tergum, dorsal.

species have very similar male genitalia, but spur count and eye size in the male offer additional means of dividing the genus into major groups.

The larvae of several species have been described (Flint, 1968a; Wiggins, 1977). They construct slightly tapered and

curved cases of small sand grains. They inhabit flowing water from small brooks to large rivers, and generally live buried in the sand. Food has been reported to be mostly arthropod remains with pieces of filamentous algae and vascular plants (Wiggins, 1977).

Key to Antioquian Species of *Marilia*

- 1. Spur count, 2,4,2 *M. flexuosa* Ulmer
- Spur count, 2,4,4 2
- 2. Forewing length 16-19 mm *M. gigas*, new species
- Forewing length 7.5-9 mm *M. microps*, new species

***Marilia flexuosa* Ulmer**

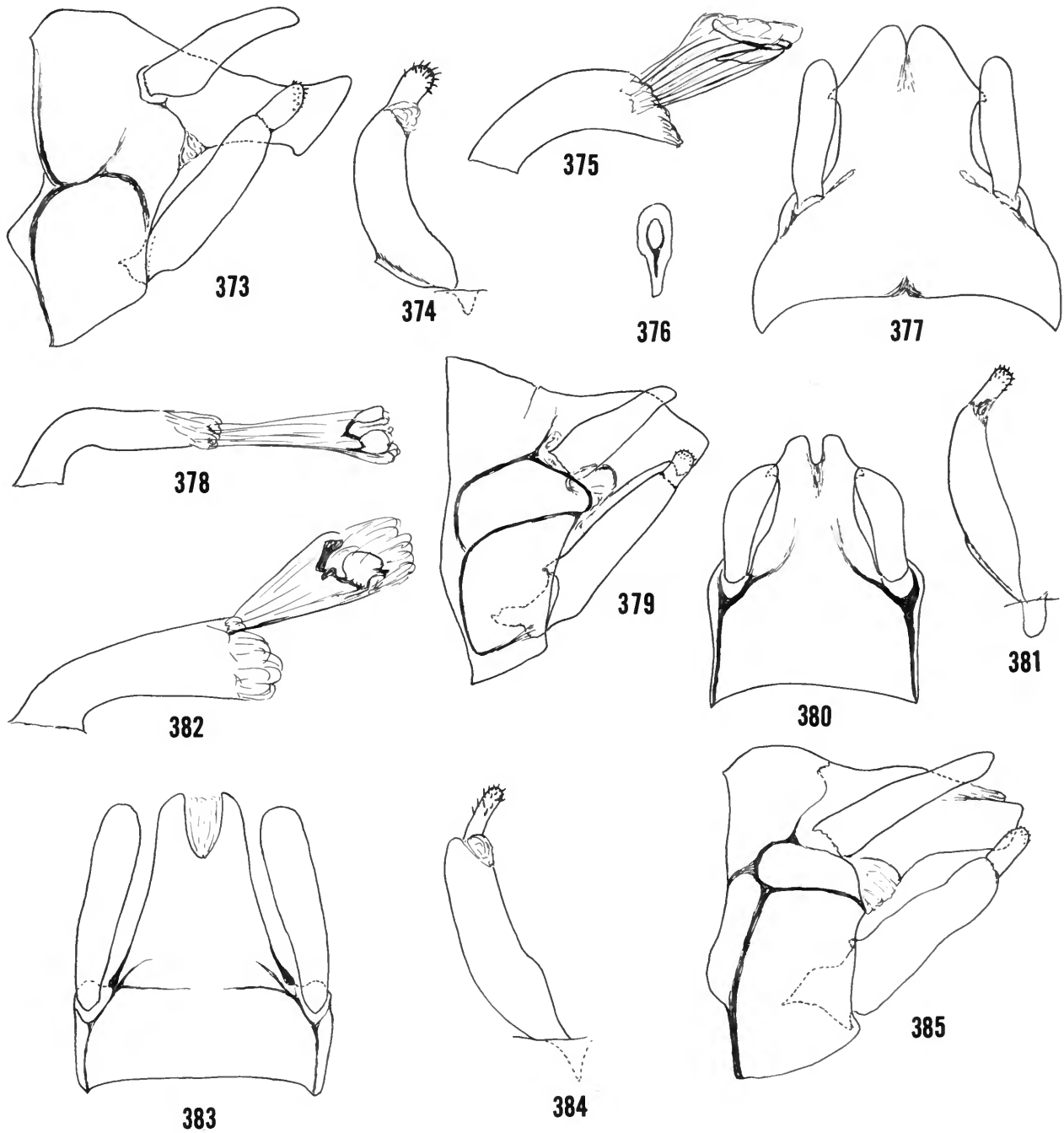
FIGURES 373-377

Marilia flexuosa Ulmer, 1905b:70.—Fischer, 1965:33.—Flint, 1967d:173.—Wiggins, 1977:298-299.

This is a widespread species known from the southwestern United States (with a tentative record from southern Ontario,

Canada) south to northern Argentina. The male is readily distinguished by its small size (forewing length 6-9 mm), spur count of 2,4,2, the peculiar thickened and bulging stigma of the forewing and the very large, bulging eyes that are contiguous middorsally. It is here recorded from Colombia for the first time. The larva was described by Wiggins (1977:298-299).

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Río Aurrá,



FIGURES 373-385.—*Marilia flexuosa* Ulmer: 373, male genitalia, lateral; 374, clasper, ventral; 375, phallus, lateral; 376, phallosomal sclerite, dorsal; 377, ninth and tenth terga, and cerci, dorsal. *M. gigas*, new species: 378, phallus, lateral; 379, male genitalia, lateral; 380, ninth and tenth terga, and cerci, dorsal; 381, clasper, ventral. *M. microps*, new species: 382, phallus, lateral; 383, ninth and tenth terga, and cerci, dorsal; 384, clasper, ventral; 385, male genitalia, lateral.

km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada La García, 20 km NW Medellín [road to San Pedro], 13 Feb 1983, O.S. Flint, Jr., 1♀. Quebrada La Cebolla, El Retiro (trap A), 21 May–29 Sept 1983, U. Matthias, 1♂, 3♀. I also have a series, containing males and females, from the Department of Valle del Cauca in Colombia.

Marilia gigas, new species

FIGURES 378–381

This species is very closely related to *M. major* Müller known from southeastern Brazil and adjacent Argentina and Paraguay. The male genitalia of the two species are virtually identical. In *M. gigas* the tenth tergum bears a distinct ventrolateral angle in both lateral and dorsal aspects, and the base of the cercus is only slightly wider than at midlength. The eyes in the males of *M. gigas* are separated by a distance greater than the width of the eye, and the vertex is barely modified. In *M. major* the eyes are separated by half or less of the width of the eye, and the vertex is deeply indented mesally.

ADULT.—Length of forewing, 16–19 mm. Color grayish; body and appendages covered with white hair; forewing with gray and white hair, mottled, with a darker mark at chord. Eyes of male with interocular distance greater than width of eye, vertex with a slight mesal impression posteriorly. **Spurs** 2,4,4. **Male genitalia:** Ninth segment nearly vertical anteriorly; with dorsal braces slightly oblique, parallel, with an incomplete ventral brace. Cercus in lateral aspect widest basally, in dorsal widest subapically. Tenth tergum decurved apically, with a strong ventrolateral hook visible in both lateral and dorsal aspects. Clasper with basal segment slightly inflated basally, nearly straight; apical segment short, straight. Phallosome angled basally; phallosomal sclerite C-shaped in lateral aspect, with both ends widened, in ventral aspect with ventral arm divided mesally.

MATERIAL.—*Holotype*, male: ECUADOR. PCIA. PASTAZA: 3 km N Puyo, 30 May 1975, Langley and Cohen. USNM Type.

Paratypes: Same data as holotype, 1♂, 5♀; same, except 1.5 km S Puyo, 18 May 1977, Spangler and Givens, 2♀; same, but 5 km E Puyo, 17 May 1977, 1♀; same, but Puyo [only], 10 May 1977, 1♀; 1–7 Feb 1976, 1♀. COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Cebolla, El Retiro (trap A), May 1983–Jan 1984, U. Matthias, 5♂, 7♀.

Marilia microps, new species

FIGURES 382–385

This species, belonging to the 2,4,4 section of the genus, is easily recognized by having small eyes that are widely separated middorsally. The appearance of the male genitalia are similar to those of *M. lateralis* Flint, but may be distinguished by the lack of apicoventral darkening on the tenth tergum,

longer cerci, and differently formed phallosomal sclerite in *M. microps*.

ADULT.—Length of forewing, 7.5–9 mm. Color pale brown; body and appendages with white hair, antennae annulate; forewing pale brown, with 3 fuscous marks centrally. Eyes of male small, separated middorsally by a distance nearly twice width of eye. **Spurs** 2,4,4. **Male genitalia:** Ninth segment nearly vertical anteriorly; with uppermost of dorsal braces only half length of ventral, with anterior marginal brace well separated from margin for dorsal half of length, no ventral brace. Cercus in lateral aspect elongate, barely tapering apically; in dorsal aspect broadly rounded apically, nearly straight and parallel-sided. Tenth tergum divided and membranous apicoventrally, with lateral lobe lacking any hook. Clasper with basal segment parallel-sided, with a very slight mesobasal bulge; apical segment slender, elongate. Phallosome curved basally; phallosomal sclerite, in lateral aspect roughly C-shaped, dorsal arm nearly straight, ventral arm enlarged, almost circular in ventral aspect rounded with a central opening.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. CHOCÓ: km 114 [road to Quibdó], 6 km E El Siete, 17 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratype: DPTO. ANTIOQUIA: 12 km N Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr., 1♂.

Marilia species

There are three females of two species in the collection that cannot be associated with any known male. It is possible that one is the female of *M. microps*, new species, but lacking firm evidence for any associations, we prefer to leave them unnamed for now. Both belong to the 2,4,4 section of the genus.

Marilia species A

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Medellín, 8 Jan 1960, F.L. Gallego, 1♀. Quebrada La Iguaná, 17 km NW Medellín [road to San Jerónimo], 22 Feb 1984, C.M. & O.S. Flint, Jr., 1♀.

Marilia species B

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Río Aurrá, 7 km W San Jerónimo, 22–23 Feb 1984, C.M. & O.S. Flint, Jr., 1♀.

Family HELICOPSYCHIDAE

This is another of the primarily tropical families with few contained genera, but with some containing a large number of species. The type genus, *Helicopsyche*, is very widespread, but less diverse in the northern temperate than in tropical areas. There are a few other small genera, primarily in the tropical regions. A second genus, *Cochliopsyche*, will probably be

found in the lowland areas of Antioquia near the larger rivers, which seems to be the preferred habitat of the genus.

All the larvae construct cases curled in the basic form of a snail shell, but varying greatly in the exact shape. All are made of sand grains, sometimes with a great deal of silk covering the sand, other species incorporating larger grains along the the outer whorl. They are basically inhabitants of flowing water, but some have been recorded from wave-washed shores of larger lakes (Wiggins, 1977).

Genus *Helicopsyche* Siebold

The genus is found over much of the world but is of restricted diversity in Europe, northern Asia, North America, and Africa. The tropics of Asia (including Australia and New Zealand) and the Americas are where the greatest diversity of species are found (Williams et al., 1983).

Herein are recorded four species in Antioquia, but it seems most probable that more species are waiting to be discovered in

other sites. Because several species are often found together, and at this time there is no certain way to associate females of one type with any particular male, we refrain from placing females in paratype series and caution that some females in emergence trap collections may well be misdetermined.

The larvae construct cases in the shape of a snail's shell of small sand grains held together by silk. There is a considerable variation in the exact shape of these helical cases between species in the same area (Flint, 1968a; Ross, 1976). They are primarily inhabitants of lotic habitats, from springs to large rivers, but have been reported from wave-washed shores of lakes and thermal waters up to 34°C (Wiggins, 1977). The larvae are grazers on the periphyton and organic debris found on rocks or in the substrate. The biology of the North American *H. borealis* (Hagen) has been investigated in considerable detail (Resh et al., 1984; Williams et al., 1983). Many of the details of the ecology of this species are probably applicable to other species in the genus.

Key to Antioquian Species of *Helicopsyche*

1. Clasper of male with a large dorsal lobe produced posteriad, basomesal lobe elongate, terete *H. vergelana* Ross
Clasper produced into a posterodorsal point, basomesal lobe broadly united to ventromesal face of clasper 2
2. Clasper with a distinct, erect, basodorsal lobe *H. angulata* Flint
Clasper evenly rounded basodorsally 3
3. Phallus with a distinct tubule extending basally from phallotremal sclerite *H. fistulata*, new species
. *H. fistulata*, new species
No tubule extending from phallotremal sclerite *H. breviterga*, new species

Helicopsyche angulata Flint

FIGURES 386, 387

Helicopsyche angulata Flint, 1981a:37-38.

Originally described from Venezuela, Colombia (Santander, Antioquia, and Valle del Cauca), and Ecuador, this species is found to be common and widespread in Antioquia and was the most abundant species of caddisfly taken in emergence trap B.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada El Pozo, 8 km W El Peñol, 9 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada Minitas, NW San Felix, 13 Feb 1983, O.S. Flint, Jr., 1♂. Quebrada Honda, Marsella [12 km SW Fredonia], 1450 m, 3-4 Mar 1984, C.M. & O.S. Flint, Jr., 3♂, 20♀; same, but 22 Feb 1983, O.S. Flint, Jr., 34♂, 27♀. Río Medellín, 6 km S Caldas, 24 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. Río Aurrá, Km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr., 2♂. Quebrada La García, 20 km NW Medellín [road to San Pedro], 20 Feb 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada El Retiro, 16 km NW Medellín [road to San Pedro], 20 Feb 1984, C.M. & O.S. Flint, Jr., 23♂. Quebrada Espadera, 7 km E Medellín

[road to Sta. Elena], 24 Feb 1983, 2♂. Quebrada La Ayurá, Envigado (trap B), Apr 1983-Mar 1984, U. Matthias, 471♂, 501♀. Medellín, 8 Jan 1960, Gallego, 2♂. There are specimens from the Colombian Departments of Meta, Santander, and Valle del Cauca in the NMNH.

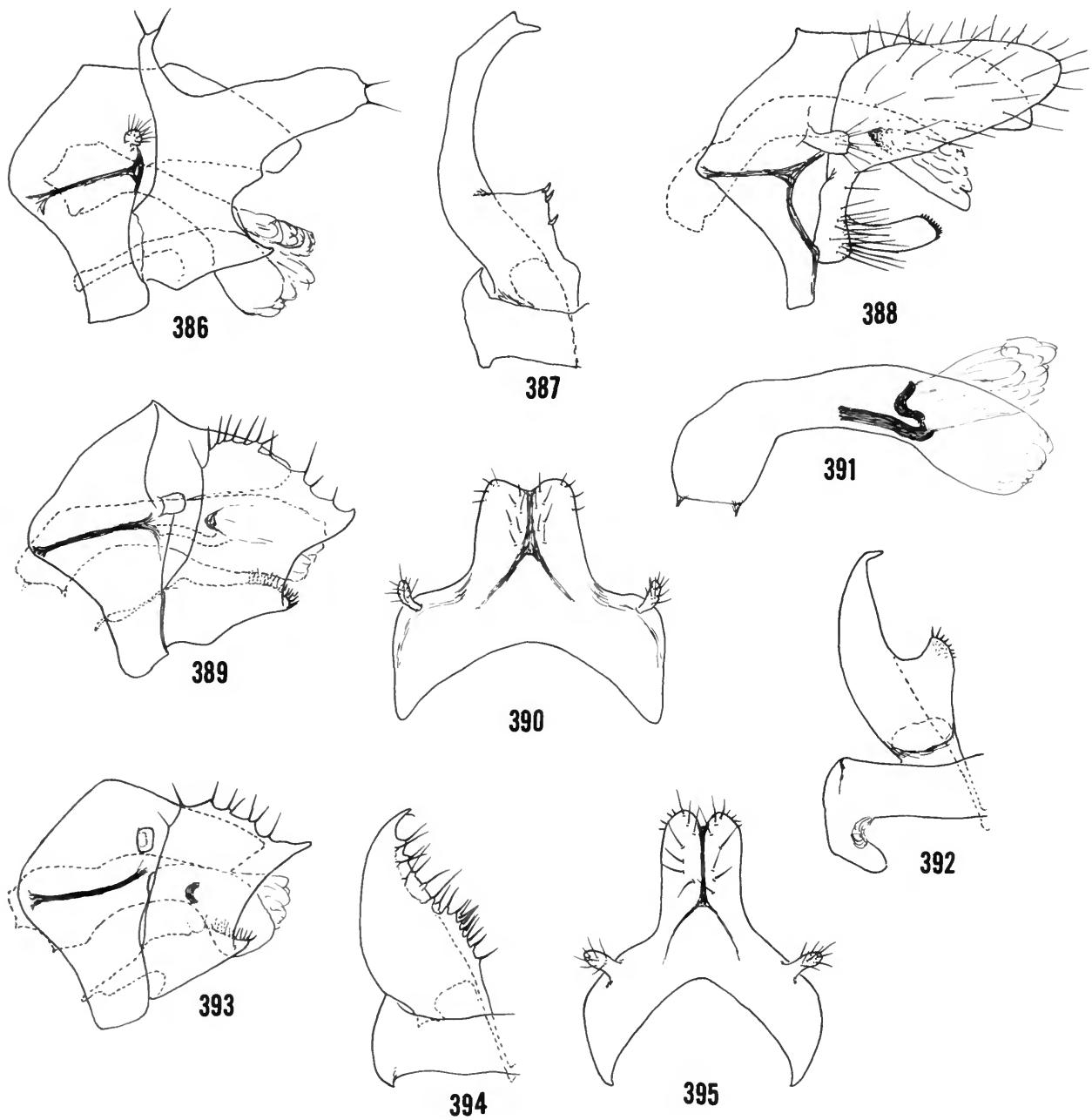
Helicopsyche vergelana Ross

FIGURE 388

Helicopsyche vergelana Ross, 1956b:400.—Flint, 1974d:144; 1981a:37.

This species was originally described from Mexico and subsequently recorded from Suriname and Venezuela. It appears to be widely distributed in Central and South America. I have seen additional examples from Honduras, Costa Rica, Panama, Trinidad, Brazil, Peru, and Paraguay.

MATERIAL.—COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Jiménez, Sopetrán (trap C), May 1983-Jan 1984, U. Matthias, 9♂, 10♀. In addition, I have seen examples from the Department of Tolima in Colombia.



FIGURES 386-395.—*Helicopsyche angulata* Flint: 386, male genitalia, lateral; 387, clasper and ninth sternum, ventral. *H. vergelana* Ross: 388, male genitalia, lateral. *H. fistulata*, new species: 389, male genitalia, lateral; 390, ninth and tenth terga, and cerci, dorsal; 391, phallus, lateral; 392, clasper and ninth sternum, ventral. *H. breviterga*, new species: 393, male genitalia, lateral; 394, clasper and ninth sternum, ventral; 395, ninth and tenth terga, and cerci, dorsal.

Helicopsyche fistulata, new species

FIGURES 389-392

This species is closely related to the following species, *H. breviterga*, new species and to *H. merida* Flint and Botosaneanu. From the former it is distinguished by the mesobasal lobe of the clasper being distinctly produced in posteroventral aspect, and from the latter by the much shorter tenth tergum and the presence of a long mesal process from the sixth sternum. From both, and all other species known to me, it is distinguished by the sclerotized, elongate tubule in the phallus.

ADULT.—Length of forewing, 5 mm. Color brown, antennae and hairs of head mesally, stramineous. Scape rather short, barely twice as long as wide, with yellow hair mesally. Sterna of abdominal segments 3, 4, and basal third of 5, reticulate; sixth sternum with a mesal process $1/2$ to $2/3$ length of sternum. *Male genitalia*: Ninth segment with anterior margin produced into a broad lobe; with a lateral sclerotized brace. Tenth tergum with scattered setae on each side, apex shallowly bifid; with a distinct Y-shaped mark. Clasper with posteroapical angle produced into a distinct point best seen in posterior aspect; dorsal margin nearly straight, irregularly produced at the bases of setae; mesobasal lobe barely visible in lateral aspect; in posterior aspect well separated from body of clasper with many apical spiniform setae. Phallus with basal third angled ventrad; internally with a C-shaped sclerite subtended by an elongate tubule.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Mosca, 1 km W Guarne, 7 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 4♂; same, but 2 Mar 1984, C.M. & O.S. Flint, Jr., 13♂. Piedras Blancas, 10 km E Medellín [road to Guarne], 7 Feb 1983, O.S. Flint, Jr., 2♂; same, but 2 Mar 1984, C.M. & O.S. Flint, Jr., 7♂. Quebrada La Cebolla, El Retiro (trap A), 17 Dec 1983, U. Matthias, 1♂. Quebrada Espadera, 7 km E Medellín [road to Sta. Elena], 24 Feb 1983, O.S. Flint, Jr., 1♂; same, but 6 Mar 1984, C.M. & O.S. Flint, Jr., 1♂. Quebrada El Retiro, 16 km NW Medellín [road to San Pedro], 20 Feb 1984, C.M. & O.S. Flint, Jr., 11♂. Quebrada La García, 20 km NW Medellín [road to San Pedro], 13 Feb 1983, O.S. Flint, Jr., 4♂. Río Aurrá, km 50, E San Jerónimo, 14 Feb 1983, O.S. Flint, Jr., 6♂. Río Medellín, 6 km S Caldas, 24 Feb 1984, C.M. & O.S. Flint, Jr., 5♂. DPTO. CHOCÓ: Río Habita, 20 km W Bolivar [in Antioquia], 17 Feb 1983, O.S. Flint, Jr., 1♂. VENEZUELA. EDO. MÉRIDA: La Pedregosa, Mérida, 21 Feb 1976, C.M. & O.S. Flint, Jr., 2♂. Río Montalban, Rt. 4, 19 km W Mérida, 20 Feb 1976, C.M. & O.S. Flint, Jr., 6♂. Edo. Barinas, 22 km NW Barinitas, 24 Feb 1976, C.M. & O.S. Flint, Jr., 1♂.

Helicopsyche breviterga, new species

FIGURES 393-395

This species is distinguished from *H. fistulata*, new species

by the mesobasal lobe of the clasper which is scarcely separated from the body of the clasper in posterior aspect, and the lack of the tubule in the phallus. It differs from *H. merida* Flint and Botosaneanu in possessing a sixth sternal process and a much shorter tenth tergum.

ADULT.—Length of forewing, 5-5.5 mm. Color pale brown; antennae and hairs of head and thorax mesally, stramineous. Scape rather short, barely twice as long as wide, with yellowish hair mesally. Sternum of abdominal segments 3, 4, and basal quarter of 5, reticulate; sixth sternum with a mesal process $2/3$ length of sternum. *Male genitalia*: Ninth segment with anterior margin produced laterally; lateral sclerotized brace slightly angled dorsad for posterior third. Tenth tergum with scattered setae on each side, tip distinctly bifid; with a Y-shaped mark dorsally. Clasper with posteroapical angle produced into a distinct point; dorsal margin nearly straight, irregularly produced at the setal bases; mesobasal lobe barely visible in lateral aspect, in posterior aspect barely distinct from body of clasper, with many spiniform setae on mesal face. Phallus with base strongly inflated, especially its dorsal margin, then slightly constricted, apex distinctly decurved; with a small C-shaped internal sclerite.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Boquerón, source of Quebrada Potreros, W La Fé, 26 Feb 1984, C.M. & O.S. Flint, Jr. USNM Type.

Paratypes: 10 km E Medellín [road to Las Palmas], 21 Feb 1984, C.M. & O.S. Flint, Jr., 2♂. Quebrada La Cebolla, El Retiro (trap A), 17 Aug 1983, U. Matthias, 2♂.

Family ANOMALOPSYCHIDAE

This small family was recently described (Flint, 1981b) for two Patagonian genera. Although I indicated in 1981 that I had larvae of the family from Colombia, they are here assigned to genus and two species are described. The family seems to be restricted to the mountainous areas of western South America and southeastern Brazil. The larvae make cases, tubular in form, of small sand grains. They inhabit small, cool, mountain brooks and possibly the surroundings of waterfalls. Nothing is known of the larval food, although the larvae of *Anomalopsyche* are usually found in the moss on the surfaces of rocks in the brook.

Genus *Contulma* Flint

The genus heretofore has contained only the type-species *C. cranifer* Flint, from Chile. In addition to the two species here described, another four species from the Department of Caldas in Colombia, three more from Ecuador, one from Peru, and four from Costa Rica have been taken. Dr. Holzenthal and I are revising this genus, wherein all these will be described as well as the larval and pupal stages. Because this paper will appear before the revision, we are including the descriptions of *C.*

colombiensis and *C. spinosa* here; they are to be attributed to Holzenthal and Flint.

The larvae have not been described before, but I possess larvae undoubtedly of several species in the genus. The larvae

are generally found in spray and splash zones around waterfalls and cascades, and the adults are swept from adjacent foliage. However, some species have been taken in small streams flowing through the paramo.

Key to Antioquian Species of *Contulma*

Posterolateral process of ninth segment pointed apically in dorsal and lateral aspects, apex hooked mesad *C. colombiensis*, new species

Posterolateral process of ninth segment pointed and hooked ventrad in lateral aspect, in dorsal aspect directed slightly mesad from base and with tip capitate, with a brush of spiniform setae ventrally *C. spinosa*, new species

Contulma colombiensis Holzenthal and Flint, new species

FIGURES 396-399

This and the following species are clearly more closely related to each other than to the Chilean *C. cranifer* Flint. The two Colombian species are distinguished easily by the structure of the male genitalia, especially the lateral processes from the ninth segment, the posteromesal structures (claspers?) and the phallus.

ADULT.—Length of forewing, male 4–4.5 mm, female 5–6 mm. Color fuscous, immaculate. Foretibia with second spur minute, barely as long as wide. No abdominal processes; posterior segments with posterior halves very hairy. **Male genitalia:** Tenth tergum very lightly sclerotized, extending hood-like over phallus. Ninth segment large, entire, with an anterolateral projection; posterolateral margin bearing a process whose apex is pointed and hooked mesad, ventrad of which is a large lobe which is densely setate. Posteromesally with a strongly sclerotized complex (possibly fused claspers and subgenital plates) which in ventral aspect is composed of a pair of dorsal lobes and a smaller, darker pair of ventral lobes; all arising from a sclerotized plate joining ninth segment ventromesally. Phallus with a sclerotized, tubular base, with membranous middle and apicodorsal regions, apicoventrally sclerotized, with tip pointed and trough-like.

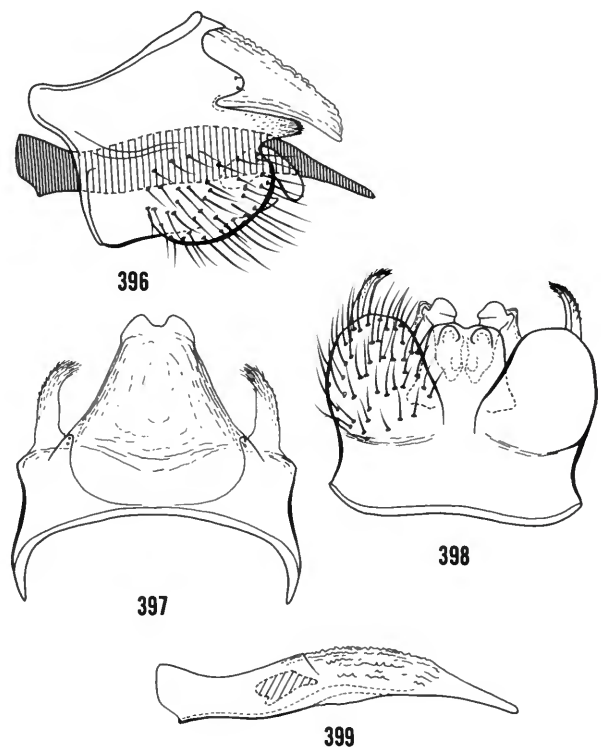
MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: 12 km N Fredonia [road to Medellín], 2000 m, 22 Feb 1983, O.S. Flint, Jr. USNM Type.

Paratypes: Same data as holotype, 1♂. 18 km E San Jerónimo [road to Medellín], 23 Feb 1984, C.M. & O.S. Flint, Jr., 1♂, 1♀. DPTO. CHOCÓ: km 114, 6 km E El Siete [road to Quibdó], 17 Feb 1983, O.S. Flint, Jr., 2♂, 2♀.

Contulma spinosa Holzenthal and Flint, new species

FIGURES 400-403

This species is similar to *C. colombiensis* Holzenthal and Flint, but easily distinguished by the structure of the male



FIGURES 396-399.—*Contulma colombiensis* Holzenthal and Flint, new species: 396, male genitalia, lateral; 397, same, dorsal; 398, same, ventral; 399, phallus, lateral.

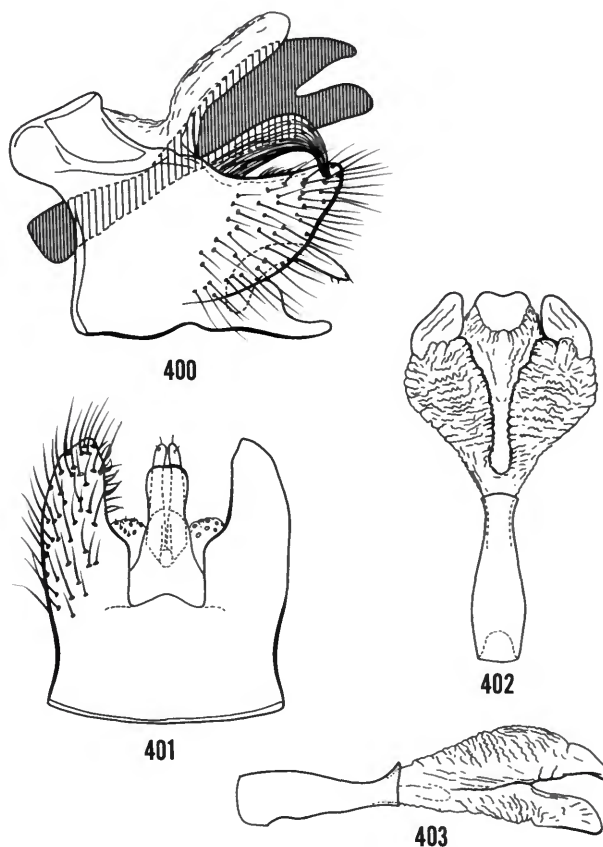
genitalia. The shape of the ninth segment and its posterior processes, the posteromesal complex, and phallus, are strikingly different in these species (and in all the other undescribed species known to me).

ADULT.—Length of forewing, 4.5–5 mm. Color fuscous, immaculate. Foretibia with second spur about 1 1/2 times as long as wide. No abdominal processes, but sixth and seventh sternite with brushes of enlarged setae. **Male genitalia:** Tenth tergum very lightly sclerotized, displaced dorsad by phallus.

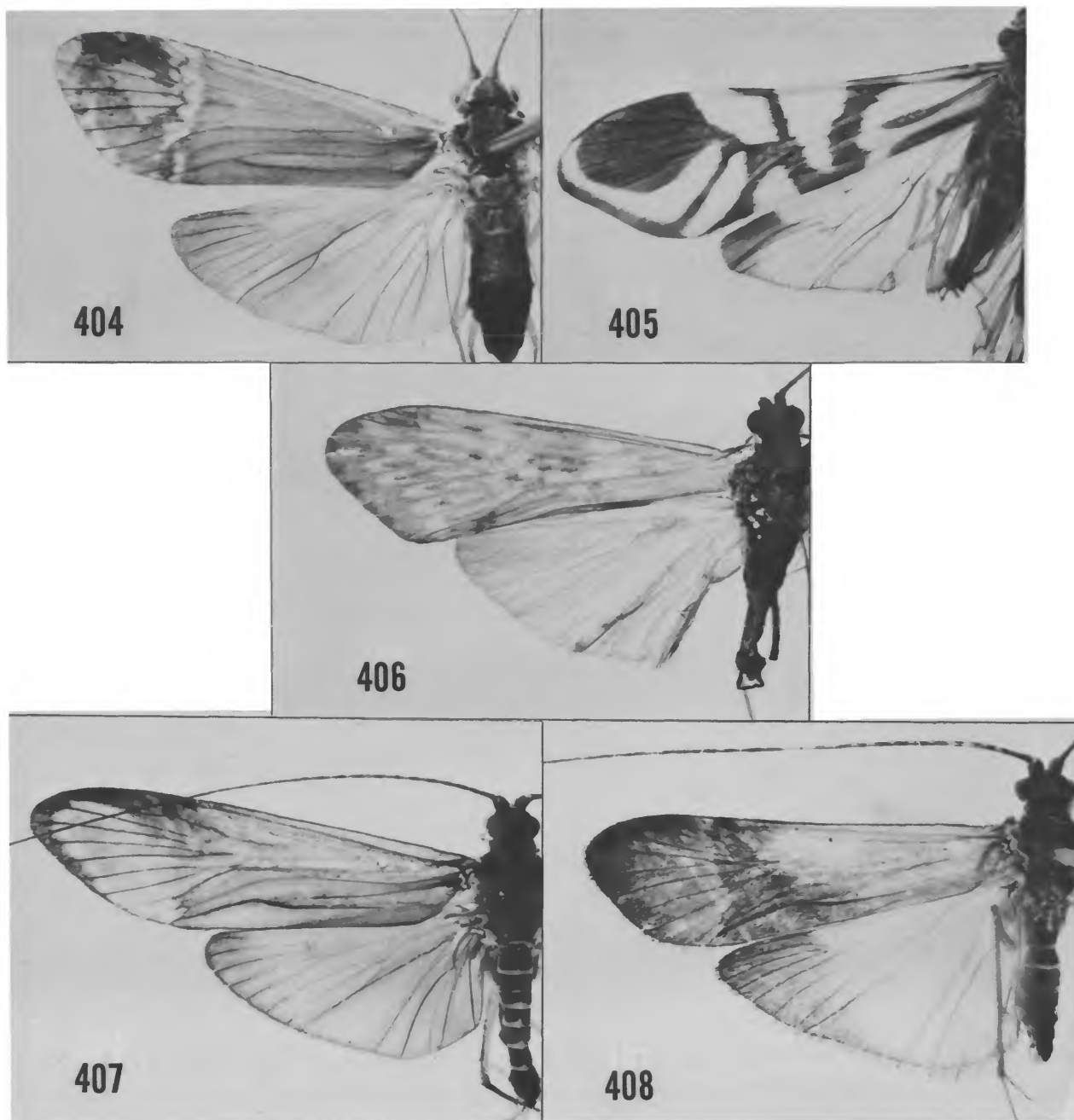
Ninth segment entire, with dorsal half displaced anteriorly, with a strong dorsolateral brace; posterolateral margin bearing a process whose apex is directed slightly ventrad and whose ventral margin bears many spinose setae; posterolateral lobe strongly produced dorsad, densely setate. Posteromesal complex C-shaped in lateral aspect, from venter with dorsal lobes elongate, closely appressed mesally, ventral lobe single, elongate; all arising from a strongly sclerotized plate joining ninth segment ventromesally. Phallus with a sclerotized tubular basal section; apically membranous and convoluted, divided into a pair of dorsolateral lobes and a mesoventral lobe, all ending in darkened, more strongly sclerotized apices.

MATERIAL.—*Holotype*, male: COLOMBIA. DPTO. ANTIOQUIA: Quebrada La Iguaná, 17 km NW Medellín [on road to San Jerónimo], 14–15 Feb 1983, O.S. Flint, Jr. USNM Type.

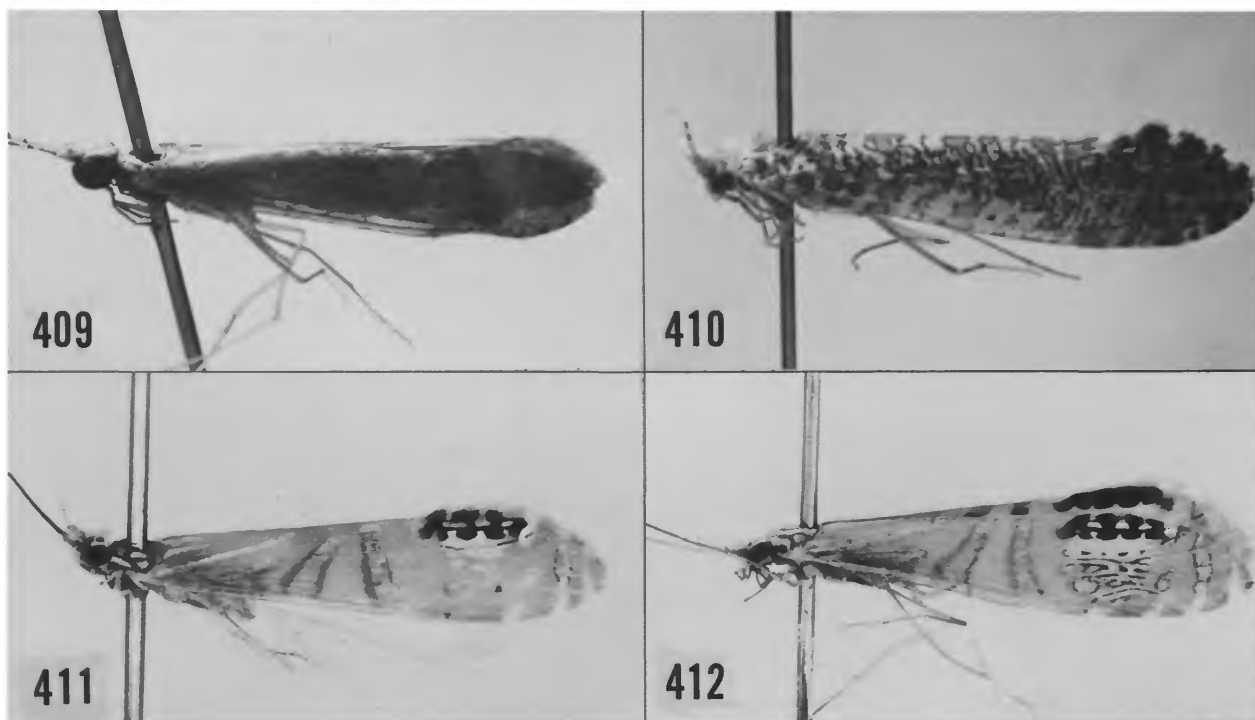
Paratypes: Same data as holotype, 1♂. DPTO. BOYACÁ: Quebrada El Chuscal, Santuario Iguaque, near Arcabuco, 2,650 m, 5 Aug 1988, Luis E. LaRotta, 1♂.



FIGURES 400–403.—*Contulma spinosa* Holzenthal and Flint, new species: 400, male genitalia, lateral; 401, same, ventral; 402, phallus, dorsal; 403, same, lateral.



FIGURES 404-408.—*Macronema hageni* Banks: 404, wings. *Macrostemum ulmeri* (Banks): 405, wings. *Leptonema cinctum* Ulmer: 406, wings. *Centromacronema excisum* (Ulmer): 407, wings. *C. apicale* (Walker): 408, wings.



FIGURES 409-412.—*Nectopsyche dorsalis* (Banks): 409, wings. *N. punctata* (Ulmer): 410, wings. *N. argentata*, new species: 411, wings. *N. gemma* (Müller): 412, wings.,

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