Two new species of phlebotomine, described below, were captured between December 1997-March 1998, in the province of Montebello, Department of Antioquia, in the Colombian Andes.

MATERIALS AND METHODS

After clearing by the method described by Forattini (1973) and mounting on microscope slides in Canada balsam medium, the specimens were measured with a Zeiss® eye-piece calibrated according to a standard Zeiss® scale and drawn with the help of an Olympus® clear chamber. All measurements are given in micrometers. The measurements of paratypes are given in parentheses. The species nomenclature is in accordance with Galati (1995).

DESCRIPTION

Pintomyia (Pifanomyia) limafalcaoae sp. nov.  
(Figs 1-16)

Holotype (male): total body length 3085. Whole insect dusky.

Head (Fig. 1): length 375; width 350. Eyes: length 205; width 120 (frontal view). Interocular distance 135. Interoculc suture not united with the antennal suture. Clypeus length 125. Antennomere lengths: AIII 380, AIV 160, AV 155, AXV 68 and AXVI 60. Antennal formula AIII-AXV 2; AXVI 0; ascoids simple and short, those on AIV 160, A V 155, AXV 68 and AXVI 60. Antennal formula: AIII 380, AIV 138, AV 135, IV 78 V 270; Newstead’s spines (ca. 7), on median third of palpomere III (Fig. 6) and absent from palpomere II. Labroepipharynx 223 long. Labium with the labial sutures united.

DESCRIPTION

Pintomyia (Pifanomyia) antioquiensis sp. nov.  
(Figs 7-14)

Holotype (male): total body length 3085. Whole insect dusky.

Head (Fig. 7): length 375; width 350. Eyes: length 205; width 120 (frontal view). Interocular distance 135. Interoculc suture not united with the antennal suture. Clypeus length 125. Antennomere lengths: AIII 380, AIV 160, AV 155, AXV 68 and AXVI 60. Antennal formula AIII-AXV 2; AXVI 0; ascoids simple and short, those on AIV 160, A V 155, AXV 68 and AXVI 60. Antennal formula: AIII 380, AIV 138, AV 135, IV 78 V 270; Newstead’s spines (ca. 7), on median third of palpomere III (Fig. 6) and absent from palpomere II. Labroepipharynx 223 long. Labium with the labial sutures united.

Cervix: ventrocervical sensillae present.

Thorax: mesonotum length 590. Pleura with 2 proepimeral setae and 12, 13 upper anepisternal setae; absence of setae on the anterior katepisternum margin and the suture between katepimeron and metepisternum. Wing (Fig. 12): length 2170, width 620. Length of vein sections: alpha 530, beta 230, gamma 240, delta 160, pi 120, R2 1340. Length of femora, tibiae, basitarsi and tarsi II+III+IV+V: foreleg 800, 1020, 640, 800; midleg, missing; hindleg 820, 1450, 800, 860.

Abdomen 2678 long. Tergites II-VII with tergal papillae. Terminalia (Fig. 14): gonostyles 127 long, with 4 and 5 major spines (Fig. 15) and one subterminal seta; the spines having the following disposition: one apical, the upper external on the 4th apical of the structure, the lower external and the internal in the middle of the structure (the gonostyle with 5 spines, the extra spine being implanted between the two external ones). Gonocoxite (250 long x 63 wide), with median tuft of ca. 12 isolated setae. Paramere simple and concave in the middle of the dorsal margin; dorsal margin length 188 and the ventral margin length 225, with the setae implanted in the 5th apical. Conical aeodeagus, dorsal margin length 77 and ventral margin length 100. Lateral lobe length 254; width 28. Genital pump: 150 long; piston length 117 and chamber length 50. Genital filaments length 430 or 2.87 times length of genital pump. Tip of genital filaments simple (Fig. 13). Cercus 195 long.

Allotype (female): total body length ca. 2870. General coloration as in the male.

Head (Fig. 2): length 380; width 390. Eyes: length 208; width 126 (frontal view). Interocular distance 135. Interoculc suture not united with the antennal suture. Interoculc distance 135. Clypeus 120 long. Flagellomeres missing. Palpomere lengths: I 38, II 130, III 135, IV 103, V, missing. Newstead’s spines (ca. 12), on median 3rd of palpomere III (Fig. 9) and absent from palpomere II. Labroepipharynx 255 long. Cibarium (Fig. 10) with ca. 20 reduced anterior teeth, five posterior teeth and lateral teeth very reduced too, pigment patch and posterior bulge not well developed, arch complete. Pharynx (Fig. 10) unarmed. Labium with sutures united. Maxilla: lacinia (Fig. 7) with 3-4 external teeth disposed in a...
Two New Species of Phebotominae • M Wolff, EAB Galati

Pintomyia (Pifanomyia) aldafalcaoae sp. nov. holotype male and allotype female - Fig. 1: head male. Fig. 2: head female. Bar = 100 µm

Cervix: ventrocervical sensillae present.

Thorax: mesonotum 670 long. Pleurae with 2, 4 proepimeral setae and 16 upper anepisternal setae. Absence of the setae on the anterior katepisternum margin and the suture between katepimeron and metepisternum. Wing (Fig. 11): length 2370 and width 730. Length of vein sections: alpha 600, beta 260, gamma 270, delta 125, pi 110, R5 1490. Length of femora, tibiae, basitarsi and tarsi II+III+IV+V: foreleg, missing; midleg 800, 1290, basitarsi and tarsi II+III+IV+V, missing; hindleg 900, 1510, 830, 880.

Abdomen length 1820. Tergite VIII without setae.

Spermathecae (Fig. 16) resemble wrinkled vesicles (25 long x 23 wide) with a much smaller apical ring (5 long x 12 wide); smooth individual ducts, 70 long x 10 wide; smooth common duct, 145 long x 20 wide. Cercus 150 long.

Collection dates and deposition of material type. Holotype male: Montebello, Antioquia Department, Colombia, 23.12.1997; allotype female same locality as holotype, 31.3.1998. Holotype and allotype deposited in entomological collection of the Department of Biology, University of Antioquia, Colombia, both captured by M Wolff & P Gutierrez with Shannon trap 18:00-20:00 h.

Locality type: Vereda Savanitas, 37 km SE of Medellin, 2060 m above sea level, 05° 54′ 8.4″N and 75° 31′ 1.3″W, in area of humid montaine forest on a rock formation containing small caves.

**Pintomyia (Pifanomyia) antioquiensis** sp. nov. (Figs 17-26)

**Pintomyia (Pifanomyia) antioquiensis** sp. nov.

Holotype (male): total body length 2650. Insect predominantly pale brown, with mesonotum darker brown.

Head (Fig. 17): length 353 (332, 340; n = 2); width 310 (300; n = 2). Eyes: length 178; width 100 (frontal view) (160, 170; n = 2). Interocular distance 115 (117, 123; n = 2). Clypeus 115 (115; n = 2). Antennomere lengths:

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Pintomyia (Pifanomyia) aldafalcaoae sp. nov. holotype male and allotype female - Fig. 1: head male. Fig. 2: head female. Bar = 100 µm
AIII 320 (305, 325; n = 2), AIV 128 (120, 127; n = 2), AV 126 (120, 127; n = 2), AXV 72 (65, 75; n = 2) and AXVI 60 (58, 60; n = 2). Antennal formula AIII-AXIV 2; AXV 1, AXVI 0; ascoids simple and short, those on AIV reaching the middle of the segment (Fig. 19); papilla present in AV (Fig. 19). AXI-AXIII with medial papilla (Figs 20, 21). Length of the palpomeres: I 38 (35, 37; n = 2), II 165 (148, 165; n = 2), III 150 (138, 150; n = 2), IV 122 (98, 120; n = 2), V 357 (305, 370; n = 2); Newstead’s spines on median third of the palpomere III (Fig. 18) and absent in the palpomere II. Labroepipharynx 227 long.

Cervix: ventrocervical sensillae present.

Thorax: mesonotum length 500 (510, 550; n = 2). Pleura with 1, 2 (1, 2; n = 2) proepimeral setae and 9, 11 (5-9; n = 2) upper anepisternal setae; absence of setae on the anterior katepisternum margin and of the suture between katepimeron and metepisternum. Wing (Fig. 22): length 1860 (1760, 1900; n = 2) and width 510 (480, 500; n = 2). Length of vein sections: alpha 460 (400, 430; n = 2), beta 160 (160, 190; n = 2), gamma 320 (300, 320; n = 2), delta 110 (60, 110; n = 2), pi 70 (110; n = 2), R5 1240 (1200, 1250; n = 2). Length of femora, tibiae, basitarsi and tarsi II+III+IV+V: foreleg, missing; midleg 720, 970, 565, 680; hindleg 750, 1150, 640, 760.

Abdomen 1300 (1230, 1370; n = 2) long. Tergites IV-VII with tergal papillae. Terminalia (Fig. 24): gonostyle (Fig. 25) 160 long (150, 160; n = 2), with 4 major spines and one subterminal seta; the spines with the following disposition: one apical, the upper external on the 4th apical of the structure, the lower external and the internal before the

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Pintomyia (Pifanomyia) aldafalcaoae sp. nov. Holotype male - Fig. 3: antennomere IV. Fig. 4: antennomere V. Fig. 5: antennomere XIII-XVI. Fig. 6: palpomere III. Bar = 100 µm

Pintomyia (Pifanomyia) aldafalcaoae sp. nov. Allotype female - Fig. 7: maxilla’s lacinia. Fig. 8: hypopharynx. Fig. 9: palpomere III. Fig. 10: cibarium. Bar = 100 µm
Wings of *Paintomyia (Pifanomyia) aldafalcaoae* sp. nov. - Fig. 11: allotype female. Fig. 12: holotype male. Bar = 500 µm

*Paintomyia (Pifanomyia) aldafalcaoae* sp. nov. holotype male - Fig. 13: aedeagus, genital pump and filaments. Fig. 14: terminalia. Fig. 15: the other gonostyle. Bar = 100 µm
middle of the structure; the internal one implanted on a prominent tubercle. Gonocoxite 275 long x 108 wide (255, 275 x 100, 107; n = 2) with three tufts of long setae. The basal tuft with ca. 40 sinuous setae; the median with 6-7 semi-foliaceous setae and the apical tuft with ca. 30 straight setae. Paramere (Figs 24, 26): dorsal margin length 227 (210, 230; n = 2) and the ventral margin length 280 (280; n = 2); the median part of the dorsal margin with evident concavity and in its apex presents a little tubercle with five setae; margin ventral with a pre-apical protuberance and a little tubercle covered with short setae. Aedeagus (Fig. 26) conical, dorsal margin length 112 (108, 112; n = 2) and the ventral margin length 75 (75, 95; n = 2). Lateral lobe (425 long x 20 wide in the middle/ 45 at the apex) (415, 430 x 20/45, 20/48; n = 2). Genital pump: 167 (167; n = 2) long; piston length 135 (125, 130; n = 2) and chamber length 60 (60, 55; n = 2). Genital filament length 627 (573, 620; n = 2) or 3.75 (3.62, 3.92; n = 2) times length of genital pump. Tip of genital filament simple, but slightly widened (Fig. 23). Cercus 245 (240, 238; n = 2) long.

Collection dates and deposition of type material. Holotype male and one paratype male: Montebello, Antioquia Department, Colombia, 31.3.1997. One paratype male same locality as holotype, 31.3.1998. All three captured by M Wolff with sticky traps (paper strips impregnated with castor oil) and deposited in the entomological collection of the Department of Biology, University of Antioquia, Colombia.

Locality type similar to P. (P.) limafalcaoae sp. nov.

**TAXONOMIC DISCUSSION**

The taxon Pifanomyia Ortiz & Scorza, 1963 was proposed as a subgenus of the genus Phlebotomus Rondani, 1840 consisting of the species of group serrana Barretto, 1962. This group of species and four other groups: vespertilionis, vesicifera, christophei and verrucarum were included in the subgenus Coromyia Barretto, 1962 of the genus Lutzomyia França, 1924 by Barretto (1962), Theodor (1965) and Lewis et al. (1977) included the species group verrucarum, consisting of the series verrucarum Fairchild, 1955 and serrana, within the genus Lutzomyia. Vianna Martins et al. (1978) considered the verrucarum species group to consist only members of...
the series verrucarum and the subgenus Pifanomyia as originally proposed, but within the genus Lutzomyia. Young and Duncan (1994) admitted group verrucarum and eliminated the series of species. Galati et al. (1995) amplified the subgenus Pifanomyia to include the series evansi, monticola, verrucarum and townsendi in the genus Lutzomyia and following Galati (1995) included two other series; pacae and pia and considered that all belonged within the genus Pintomyia Costa Lima, 1932, together with the subgenus Pintomyia, s. str.

Both sexes of this genus may be characterized as follows: 5th palpomere longer than 3rd; on this palpomere, Newstead’s spines occur between the median and pre-apical regions; ventrocervical sensillae present and the setae on the anterior margin of katepisternum may occur. Male: flagellomere with short ascoids, those on AIV, commonly not passing the middle of the segment; hypopharynx with well delimited and deep teeth; lacinia with external teeth disposed in a single and longitudinal row, cibarium with four (sometimes five or six) posterior horizontal teeth and the anterior (vertical) teeth in one or two transversal rows, complete sclerotised arch; Tergite VIII with or without setae; spermathecae with long common duct, the individual ducts may or may not be sclerotised, the body predominantly vesicular with or without wrinkled aspect, apical ring and distinct terminal knob. The subgenus Pifanomyia is distinguished from Pintomyia, s. str, in both sexes by the absence of spines on the hind femur and in the females by the spermathecae which present an apical ring, distinct knob and unsclerotised individual ducts.

In the male, the presence on the gonostyle of one major apical spine, the subapical seta and extra individual spines and in the female the wrinkled vesicular aspect of the spermatheca with a much narrower apical ring, long common duct and shorter individual ducts, lead us to consider P. limafalcaeoae sp. nov. as belonging to the series pia. This series had hitherto been constituted of seven species: P. pia (Fairchild & Hertig, 1961), P. reclusa (Fernandez & Rogers, 1991), P. suapiensis (Le Pont, Torrez-Espejo & Dujardin, 1997), P. tihuiliensis (Le Pont, Torrez-Espejo & Dujardin, 1997), P. tocaniensis (Le Pont, Torrez-Espejo & Dujardin, 1997), P. torrealbai (Vianna Martins, Fernandez & Falcão, 1979) and P. valderramai (Cazorla, 1988). With the exception of P. pia, all these species are known by specimens of only one of the sexes; P. suapiensis, P. tihuiliensis and P. tocaniensis by the female and P. reclusa, P. torrealbai and P. valderramai by the male.

P. pia was included in the species group oswaldoi of the genus Lutzomyia by Theodor (1965) and by Cazorla (1988), to which P. valderramai was also considered to belong. Young and Duncan (1994) included this latter species in this group, but P. pia was considered to be an ungrouped species, as was P. torrealbai. Vianna Martins et al. (1978) included P. pia in isolated or aberrant species and Vianna Martins et al. (1979) consider P. torrealbai as an aberrant species. P. reclusa was included in the subgenus Helcocorytomyia Barretto, 1962 by Fernandez and Rogers (1991) and Young and Duncan (1994). Le Pont et al. (1997) consider P. suapiensis, P. tihuiliensis and P. tocaniensis as incertae sedis and suggest that this three species may, together with P. pia, constitute another series of the subgenus Pifanomyia.

The male and the female of this new species may be distinguished from the others of the series pia by the characteristics in the identification key presented below:

**Males**

1. Tuft of the gonocoxite sparse and situated on the median 3rd ........................................... 2

Tuft of the gonocoxite compact and situated on the basal-median part ........................................... 3

2(1) Dorsal margin of the paramere almost straight and the setae on the apical 3rd ...................................... P. pia
Dorsal margin of the paramere curve and the apical setae on the apical 5th .......... \textit{P. limafalcaoae} sp. nov.

Labroepipharynx \textit{ca.} 220 \textmu m; AIII \textit{ca.} 300 \textmu m ........... 4

Tuft of the gonocoxite with \textit{ca.} 10 setae

............................................................................. \textit{P. torrealbai}

Tuft of the gonocoxite with \textit{ca.} 17-19 setae

..................................................................

\textit{P. valderramai}

Females

1 Labroepipharynx more than 350 \textmu m ...................... 2

Labroepipharynx smaller than or equal to 310 \textmu m .......... 3

2(1) Pleurae all brown ................................................. \textit{P. pia}

Pleurae brown only in the basal region .............

............................................................... \textit{P. tihiuliensis}

3(1) Pleurae all brown ............................................. \textit{P. limafalcaoae} sp. nov.

Pleurae partially brown or completely pale ...........

4(3) Pleurae completely pale ........................... \textit{P. tocainensis}

Pleurae brown in its basal part .................. \textit{P. suapiensis}

The \textit{Pintomyia} (\textit{Pifanomyia}) \textit{antioquiensis} sp. nov. presents papilla in AV; gonocoxite with a sclerotised band on the basal ventral margin and presence of tufts of setae; gonostyle with four spines, with the internal one implanted before or in the middle of the structure; presence of tergal papillae in some tergites may be included, according to Galati (1995), into the series \textit{verrucarum}. Based on these characteristics eight species are included in this series: \textit{P. andina} (Osorno, Osorno-Mesa & Morales, 1972), \textit{P. aulari} (Feliciangeli, Ordoñez & Manzantilla, 1984), \textit{P. cajamarcescens} (Galati, Cáceres & Le Pont, 1995), \textit{P. columbiana} (Ristorcelli & Van Ty, 1941), \textit{P. deorsa} (Pérez, Ogusuku, Monje & Young, 1991), \textit{P. disiuncta} (Moraes, Osorno & Osorno-Mesa, 1974), \textit{P. moralesi} (Young, 1979) and \textit{P. verrucarum} (Townsend, 1913).

The male of \textit{P. antioquiensis} may be distinguished from the other species of the series \textit{verrucarum} by the characteristics present in the following identification key:

1 Gonocoxite with single basal tuft of setae .............. 2

Gonocoxite with two or more tufts of setae .......... 3

2(1) Aedeagus arched, which apex is turned downwards, just as a goose’s head ...................................... \textit{P. deorsa}

Aedeagus simple and conical ........................... \textit{P. columbiana}

3(1) Gonostyle with the internal spine implanted in accentuated tubercle ....................................... 4

Gonostyle with the internal spine implanted in discrete tubercle .............................................. 7

4(3) Gonocoxite with three tufts of setae .................. 5

Gonocoxite with two tufts of setae ...................... 6

5(4) Apex of the inferior external spine of gonostyle truncated and with slight expansion .................. \textit{P. antioquiensis} sp. nov.

6(4) Apex of the inferior external spine of gonostyle pointed .................................. \textit{P. aulari}

7(3) Gonostyle with columnar aspect, the distance between the external spines greater than twice the distance of
the superior external from the apical spines...............8
Gonostyle with the distance between the external
spines similar to the distance between superior exter-
nal and the apical spines ..................... P. verrucarum
8(7) Dorsal margin’s paramere strongly concave and with
apical fringe of long setae ....................... P. cajamarcensis
Dorsal margin’s paramere with slight concavity and
without apical fringe of setae ....................... P. disiuncta

Etymology. By conferring the name P. (P.) limafalcaoae
we pay tribute to researcher Alda Lima Falcão of the Centro
de Pesquisa René Rachou, Fundação Oswaldo Cruz, Belo
Horizonte, Brazil, for her great contribution to our knowl-
edge of American sand flies. The other new species takes
its name from the Department of Antioquia, Colombia,
where the species was captured.

The association of the sexes of P. (P.) limafalcaoae
was based on the capture of males and females in the
same place, on the compatibility of genital characteristics
and similarities of the extra genital characteristics.

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