Population composition and dynamics of *Lutzomya longipalpis* and other Phlebotominae species in Clorinda, Northern Argentina

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Introduction

In Argentina, the first record of *Lu. longipalpis* occurred in 2004 in an urban scenario, namely the city of Clorinda (25°17' 11.12" S57° 43' 18.30" W), Formosa Province. After this report and up to 2012, this species was recorded in several provinces in the Northeast and Center Regions of Argentina (Misiones, Corrientes, Chaco, and Entre Ríos). In 2013, this species was first reported in the northeast of the country, in the city of Tartagal (22°31" 14.00" S 63° 47' 58.94' W), located in Salta Province.
In 2012, taking into account the first urban record of *Lu. longipalpis* in Clorinda the entomological background recorded, and the epidemiological importance of this scenario, it was considered necessary to implement Phlebotominae monitoring in this locality. Clorinda is a city that is located 115 km from Formosa (provincial capital city) and 40 km from Asunción (capital of the Republic of Paraguay), on the banks of the Pilcomayo River (Fig. 1).

Figure 1. Geographic location of Clorinda and Puerto Pilcomayo.

Materials and methods

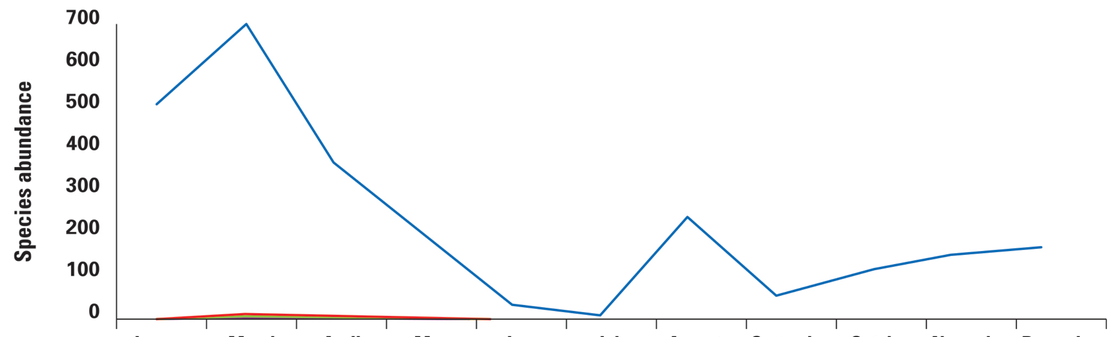
To collect Phlebotominae, 20 peridomestic points in Clorinda and Puerto Pilcomayo were selected with the 'worst scenario' criterion and the data of previous captures. Each point was sampled from January to December 2012, two consecutive nights/month (Fig. 2, 3), with CDC light minitraps, 1.5 meters above the ground.
So as to separate the Phlebotominae from the rest of the insects captured, the samples collected were observed under a stereomicroscope at the Mundo Sano laboratory located in the Clorinda Operation Center. The Phlebotominae present were sent to a REDILA reference laboratory to be identified at the species level.
Considering the different environmental situations present in this locality throughout the year, minimum and maximum temperature values were also recorded during sampling days. These data were obtained from the reports of the weather station of the Cooperativa de Provisión de Obras y Servicios Públicos Clorinda Limitada.

Figure 2. Location of sampling points in Clorinda and Puerto Pilcomayo.

Figure 3. Peridomestic points.

Results

From January 2012 to December 2012, 2596 Phlebotominae were collected: *Lutzomyia longipalpis* (98.8 % of the total of species), *Migonemyia migonei* (0.5%), *Nyssomyia whitmani* (0.5%) *and Bruptomyia sp* (0.2%). *Lu. Longipalpis* was collected at the 20 sampling points assayed throughout the year. March (the beginning of autumn) was the month with the highest record of Phlebotominae, with 703 individuals/month. This was also the month when the greatest amount of *Lu. longipalpis* (689/month) was collected. July (winter) was the month with the lowest abundance of Phlebotominae with 12 individuals, all corresponding to *Lu. longipalpis* (Fig. 4). The abundance also varies with the sampling point (Fig. 5). The first 15 points (CLO 1 – CLO 15) were located in the Clorinda urban area and the last 5 (PP1 – PP5); CL3 and CL12 provided the greatest number of individuals.



	January	March	April	May	June	July	August	September	October	November	December
Lu. longipalpis	508	689	367	194	34	12	242	55	116	153	1/0
Mg. migonei	1	10	0	0	0	0	0	0	0	0	2
Ny. whitmani	2	4	0	2	0	0	0	1	1	1	3
Bruptomyia	0	0	1	1	0	0	0	0	0	0	2

Figure 4. Abundace of Phlebotominae species in Clorinda and Puerto Pilcomayo.
For the descriptive analysis, Clorinda and Puerto Pilcomayo were considered a single sampling area due to their nearness and likeness in environmental and socio-demographic characteristics.

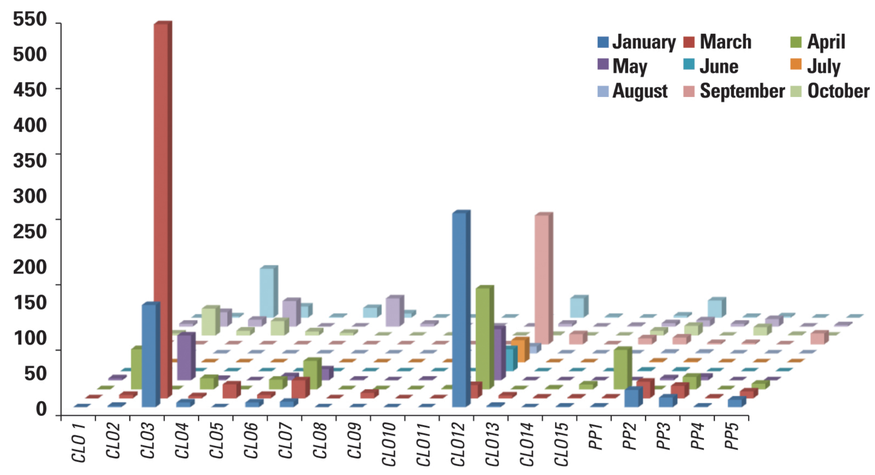


Figure 5. Dynamics of *Lu. longipalpis* in Clorinda and Puerto Pilcomayo.

In relation to the temperature and relative humidity recorded during the sampling months (Table 1), the highest temperature during the sampling days was recorded in March (39.05°C), as well as the second lower record of relative humidity (64.70% RH), while during this month the highest abundance of *Lu. longipalpis* were collected. On the other hand, the month presenting the least abundance of Phlebotominae was not the month recording the lowest temperatures (August MaxT. 21.96°C – MinT. 11.46°C).

Table 1. Environmental conditions during the sampling period (Year 2012).

Sampling month	% Temperature (°C)		% Relative Humidity
	Maximum	Minimum	
January	34.23	22.4	75.27
March	39.05	25.65	64.70
April	27.05	16.95	88.70
May	29.13	20.45	91.83
June	26.375	17.8	91.42
July	22.6	14.43	87.55
August	21.96	11.46	80.95
September	24.45	11.85	59.21
October	30.33	21.8	79.04
November	34.83	23.23	78.26
December	36.73	27.25	75.08

Conclusions

Lu. longipalpis was the species with the highest prevalence in all the urban area, but with heterogeneous abundance in the space due to the microhabitat characteristics, and in time due to seasonal and daily climatological variation. The characterization of *Lu. Longipalpis* population dynamics, the identification of the sites and landscapes with higher abundance, and the monthly trends will contribute to design controlled assays of vector control for this city located in a country border and risk of epidemic transmission of Visceral Leishmaniasis.