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**Survey on entomofauna of sanitary importance in
Territory adjacent to the Open Dump – Distrito
Federal, Brazil**

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**Survey on entomofauna of sanitary importance in
Territory adjacent to the Joquei landfill of Cidade
Estrutural – Distrito Federal**

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Research project for the Post-graduate Program in Tropical Medicine of the Medical School of the University of Brasília to obtain a master's degree in Tropical Medicine, in the area of concentration: Biology of infectious and parasitic diseases.

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1. Introduction

The entomofauna is present in all the ecosystems and plays important ecological roles. When related to human activities, insect species may be present causing loss or health problems, as the agricultural pests or disease vectors. However, it is also possible to find several groups of beneficial insects, which collaborate for the environmental balance or even of great economic importance, as the biological control agents of pest and bees.

However, in addition to acting as vectors of the agents that cause diseases, insects are also reported as mechanical vectors (conveyors) of several other agents whether bacterial, fungal, viral, protozoal, or helminthic.

Many insects are associated with the cycle and transmission of diseases that are important to man and other vertebrates. Among these diseases, stand out the malaria, dengue, Zika, Chikungunya, Yellow Fever, Chagas Disease and cutaneous and visceral leishmaniasis (Consoli & Lourenço-de-Oliveira, 1994; Forattini, 1997; Carcavallo et al., 1998b, a, 1999; Forattini, 2002; Rangel & Lainson, 2003).

As scavengers, stressors and/or vectors of human infectious agents, it is possible to mention the flies, mosquitoes, fleas, lice, and barbers.

Hematophagous insects generally transmit infectious agents by inoculation through the skin during feeding directly into the bloodstream, as it happens with mosquitoes (dengue, chikungunya, zika, yellow fever, malaria, filariasis, Japanese encephalitis and West Nile fever), with sandflies (cutaneous and visceral leishmaniasis) and with the tsetse fly (sleep disease). The triatomines (Chagas disease), however, transmit the infectious agent when they defecate after feeding, and the inoculation occurs by contamination of the mucous membranes and the area of damaged skin with the fecal residues through the act of scratching.

There is a close relationship between the dynamics of disease transmission and the biological and ecological characteristics of these vectors. The reproductive capacity, food preferences, temperature, humidity, seasonality and the peculiarities of transmission of these vectors determine the relative importance of these as transmitters of a disease.

Environmental variables such as water availability, rainfall, temperature, humidity and altitude may influence the cycle of infectious agents in arthropods or in the development of the vectors themselves.

However, physical and biological environmental changes modify the landscape and compromise ecosystems over time, and therefore require the modification of survival strategies for the adaptation of the entomofauna. For Fernandez (2004) the environmental changes occur for several causes, many denominated natural and others coming from anthropological interventions, considered unnatural. It is a fact that the contemporary technological development and the communities culture have contributed to the intensification of these changes in the environment, especially in the urban environment.

The environmental changes that occurred because of the installation of the landfill in an area adjacent to the National Park of Brasília and the disorderly and accelerated growth of Cidade Estrutural led to changes in the native vegetation cover of this region. The population density and the irregular occupation, without the planning of the environmental health of the soil created population agglomerates with precarious conditions of infrastructure, leading to the formation of microenvironments that favor the creation and proliferation of disease vectors.

Studies carried out by the Board of the Environmental Health Surveillance indicate that the occurrence of diseases such as Leishmaniasis in DF is related to the insertion of residences nearby the forest and/or to the exposure of people in areas of preserved or residual forest for leisure or occupational activities. Thus, it is expected that the epidemiological pattern will be modified by changes in the primary scenario. (Carvalho et al, 2010).

The areas selected for the study are characterized by being part of environmental protection (area of the National Park of Brasília); being an area with rural characteristics (used mostly for the production of vegetables, near the park and the area of the landfill of Brasília); and being an area of increasing disorganized urbanization, bordering the landfill of Cidade Estrutural, in Distrito Federal, which is called Santa Luzia. These areas have distinct destinations, but are connected by their geographical boundaries. The objective is to analyze the entomofauna of the location and evaluate what the possible transition of fauna between the areas may be causing to the existing population of

Estrutural and to the landfill workers, and the impact left by the installation of the landfill in an area close to the area of environmental protection and the expansion of the Estrutural city, correlating these factors to the possible expansion of the performance of specimens of the different fauna and their adaptation to the new urban centers and the risks arising from this expansion to the health of the local population.

In addition, the population analysis of disease-carrying insects will be important, since they will be a first step towards linking the diseases transmitted by these agents in the territory to the integrated vector control program, which seeks to increase or preserve the natural mortality factors and to be assertive regarding the need of blocking the transmission of diseases through the use of chemicals used in public health to control vectors. The analysis will provide information about the biological cycle, peaks of occurrence, and population density of the insects in the territories selected for the study.

2. Justification

Territories with environmental degradation, which is typical of places with the presence of areas with inadequate disposal of solid waste or even preserved areas present in their fauna diverse species of vectors of diseases.

To know this fauna is a primordial step for the mapping and linking of possible communicable diseases to the population of these places, passersby and from nearby cities. Some communicable diseases depend, in addition to the symptomatology, on the certainty of exposure of the individual to a particular fauna for a case definition. In addition, this type of environmental indicator is essential to guide the disease prevention, control actions, health promotion, and instrumentalization of health professionals in the definition of cases and in the choice of appropriate treatments for the infected patients and for the population control of these vectors.

However, there are no records of specific studies of the entomofauna of sanitary importance in Cidade Estrutural, whose location is bordering the area of the Brasilia National Park, a landfill, and the stream of Cabeceira do Valo (presence of more preserved and severely degraded areas).

Thus, this study aims to know the entomofauna of sanitary importance of three distinct areas of Cidade Estrutural, filling the existing gap linking the symptomatology of some diseases to this territory and, mainly, seeking to contribute to the provision of health services and more effective governmental actions to the population of Cidade Estrutural.

2. Objectives

2.1 General objective

To describe and analyze the composition of the entomofauna of importance in health of the area near the National Park, rural area of Cabeceira do Valo and Setor Santa Luzia, bordering the landfill of Cidade Estrutural, in Distrito Federal.

2.2 Specific Objectives

- To characterize the entomofauna of the selected Area;
- To map the areas with the possible presence of vectors of sanitary importance;
- To correlate the entomofauna found to the transmitted diseases in the territory;
- To identify the seasonality of the entomofauna in the study regions;
- To build a database of the species found in the studied places;
- To quantify the most prevalent species of sanitary importance;
- To identify possible natural and artificial breeding locations of vectors of importance in health;
- To investigate physicochemical parameters of positive breeding locations for the presence of immature forms of vectors;
- To discuss the importance and applicability of the results obtained for Public Health.

3. Method

Initially, a bibliographic review and the analysis of study areas will be carried out, considering the environments of the landfill, of an area with more preserved vegetation and fauna next to the National Park of Brasilia and near the Cabeceira do Valo stream, in which there are approximately 40 small farms; these areas will be geo-referenced and CDC traps will be set up to systematically catch phlebotomines and

other insects, which will be attracted by a light bait, ovitraps and larval traps, in order to capture immature forms of mosquitoes and adultrap. In these areas, when natural and artificial breeding grounds for immature forms of mosquitoes are identified, water samples will be collected for physico-chemical analysis.

In the selected houses, educational lectures will be held with the purpose of training the residents to answer a questionnaire regarding the presence of triatomines in the place and the delivery of possible samples at the Health Unit of the city for further referral and identification in the laboratory of Entomology of the University of Brasília – UnB.

The samples captured by the traps will be sent for screening and identification to the entomology laboratory of the University of Brasília – UnB.

The water samples will be analyzed on the location with the use of appropriate equipment.

The analyzes results will be regularly tabulated in an Excel spreadsheet for control and later mapping in a geo-referencing program.

Finally, the study will be structured through dissertation writing and scientific articles, which make feasible the dissemination of the research and the theoretical and practical reflections for the orientation of the local health and governmental services. The schedule, at the end of the project, presents a better detail of the work plan.

4. Technical Feasibility of the Project Execution

The research will be carried out under the service of the researcher, Health Specialist – Biologist, effective servant of the Family Health Strategy Support Center (NASF–Núcleo de Apoio a Estratégia Saúde da Família), which provides matrix support to ten teams of the Family Health Strategy in Cidade Estrutural – DF, and one of the responsible for the Epidemiological Surveillance service of the teams. The results of the research will be used to aid in the diagnosis of vector-transmitted diseases in the Territory, and for health education actions and integrated control of the entomofauna of sanitary importance of Cidade Estrutural, in Distrito Federal.

5. SCHEDULE

ACTIVITIES	YEAR 1				YEAR 2			
	quarter				quarter			
	1	2	3	4	1	2	3	4
Submission of the project to CEP	■							
Subjects	■	■	■	■	■	■	■	■
Review of the area literature	■	■	■	■	■	■	■	■
Identification of the territory for data collection	■							
Selection of locations for the installation of collection instruments	■							
Authorization request to install collection instruments	■							
Sample collection		■	■	■	■	■		
Screening and identification of the collected samples		■	■	■	■	■		
Analysis and processing of the data						■	■	
Discussion of the results						■	■	
Qualification exam								
Writing of the thesis						■	■	■
Final revision and editing of the thesis								
Production and submission of scientific articles about the study				■			■	■
Submission and defense of the thesis								■

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