PROFILE OF APPLICATORS OF PESTICIDES IN THE CITY OF CASIMIRO DE ABREU / RJ AND GENOTOXIC EFFECTS

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INTRODUCTION

The city of Casimiro de Abreu, located in the coastal plain of the State of Rio de Janeiro, has intense agricultural activity with the use of pesticides with genotoxic potential (e.g. glyphosate, 2,4-D). This work aimed to characterize the sociodemographic and clinical profile applicators of pesticide in the city of Casimiro de Abreu / RJ, as well as to evaluate genotoxic effects, using the micronucleus test with blockade of cytokinesis (MNCtB) in applicators of pesticides in the city of Casimiro de Abreu / Rio de Janeiro (RJ).

METHODS

Figure 1: Graphic representation of project steps

- **Recruitment**: Agrochemical applicators were recruited through a convenience sample (non-randomly). They residing in the rural area of the Casimiro de Abreu/ RJ, with age group of 18 years or more. Controls were included of the urban area of the same country, matched by sex and age. They were professionals who perform activities without contact with pesticides.
- **Interviews and data collection:** The collection of sociodemographic, clinical and occupational data was performed through interviews with pre-tested questionnaires.
- **Collection of peripheral blood**: The samples were collected by specialized professionals.
- **Laboratory Assays**: Whole blood (500 uL) was maintained in culture (RPMI 1640 + 20% fetal bovine serum + 3% phytohemagglutinin) for 72 hours. The cytochalasin B (4.5 ug/mL) was added to the cultures 44 hours after the start of culture to stop cytokinesis and to obtain binucleated cells. Blades stained with 5% Giemsa solution were evaluated to investigate the presence of micronuclei in 2000 binucleated peripheral lymphocytes and the nuclear division index (IDN) in 1000 cells with one or more nuclei.
- **Statistical analysis:** Descriptive analysis of the data with measures of central tendency of dispersion of the continuous variables and simple and relative frequencies of the categorical variables.

CONCLUSION

These are partial results for applicators of pesticides. Glyphosate is one of the most widely used herbicides in Brazil and there are epidemiological and experimental data on its genotoxic effects.

RESULTS

Table 1: Sociodemographic Data the pesicide applicators (N = 24). Casimiro de Abreu. 2017-2018

Variables	N	%
Sex		
Men	24	100
Age		
18-35	2	8,3
36-60	15	62,5
> 60	7	29,2
Mean (range)	54,5 (25 - 80)	
Skin color		
White	12	50,0
Others	12	50,0
Level of schooling		
Illiterate	4	16,7
Preschool	1	4,1
Primary school	15	62,5
High school	4	16,7

Most of these workers apply glyphosate in agricultural production through the manual costal spray. The main symptoms reported by this group after contact with pesticides were: irritability (33.3%), involuntary movements (33.3%), difficulty in seeing (13.3%). About 40% are active smokers and the same proportion reports the consumption of alcoholic beverages.

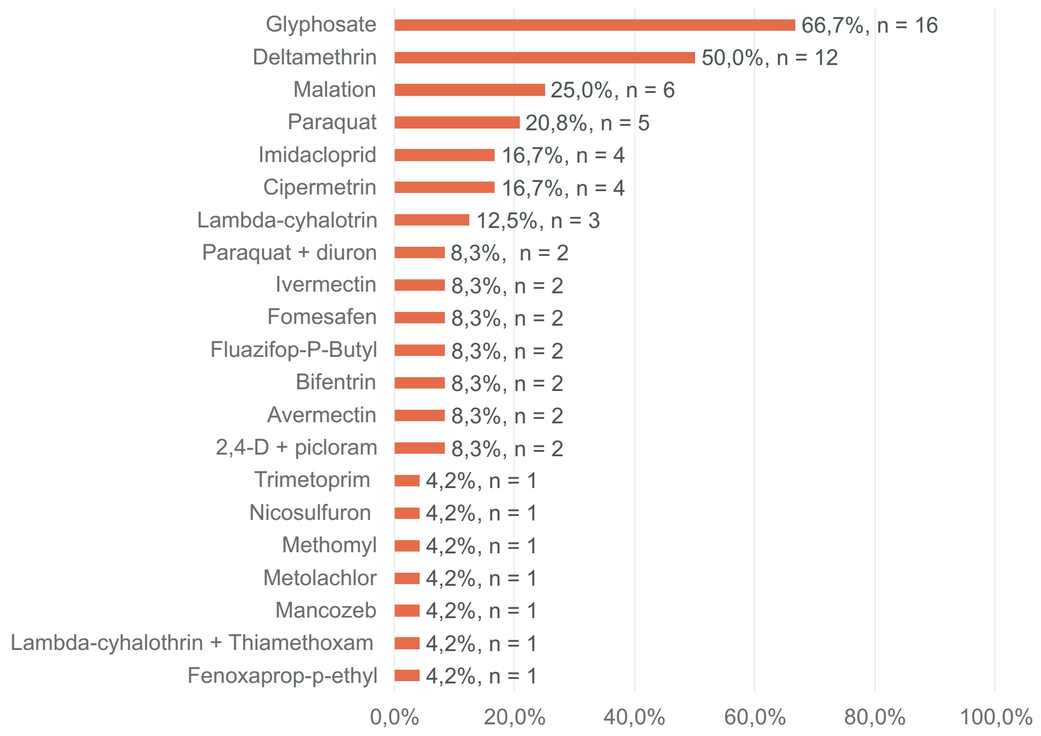

Figure 2: Frequency of use the pesticides by applicators. Casimiro de Abreu, 2017- 2018

The IDN for all participants recruited to date (N=23) was 1.14 ± 0.1 (mean and standard deviation). To date, mutagenic data was evaluated in four pesticide applicators. The frequency of micronucleus (MN) and total of micronucleus (tMN) was 4.6 ± 1.0 and 4.8 ± 1.0. Nuclear bridge (0.4 ± 0.3) and nuclear bud (1.5 ± 0.4) were other cytogenetic changes available at this study.

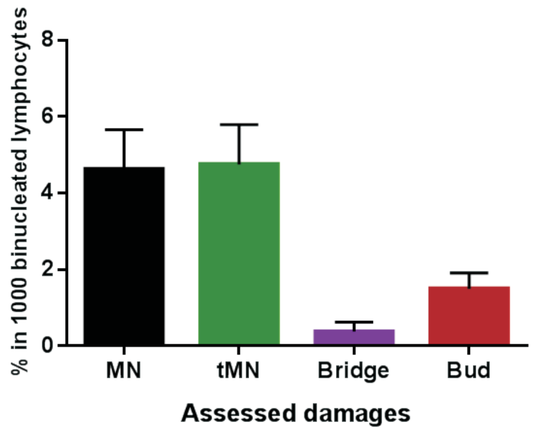

Figure 3: Frequency of cytogenetic changes analyzed for pesticide applicatores living in the Casimiro de Abreu, Rio de Janeiro

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