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TEXTILE DESIGN OF STUCTURES WITH FUNCTIONAL PROPERTIES REPELLENCE FLYER OF MALARIA

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ABSTRACT

The present work together in the design and functional design of clothing for babies, with the Insect repellent properties of Malaria, including a babygrow with features that fall within the area of functional textiles, which repel and kill not only insect of the malaria other insects as well as propagators of other diseases. Currently, malaria is one of the major scourges of mankind, taking place annually between 300 to 500 million malaria infections severe, leading to an estimated 1 million deaths, of which more than 75% of the victims African children under the age of 5 years, infected with *Plasmodium falciparum*. It also presents a high risk for travelers and migrants. Given these impressive numbers, it was felt necessary to protect the most vulnerable members of society, those most affected by this terrible and deadly disease, children, through a contribution in optimizing their quality of life.

Keywords: Design; babygrow; functionality; nanoparticles; repellents; IR3535; protection; malaria

INTRODUCTION

The idea of doing a study, in which, through functional textiles, the quality of life of people suffering from malaria could be improved, came from the special curiosity in understanding more about this disease and also to be able to work closely with humanitarian causes, in a more conscious way. This study will be a giant step/blessing for the protection of human health in the areas most affected by malaria. Malaria is the severe or fatal infectious disease that more affects mankind, affecting five times more than HIV, leprosy, measles and tuberculosis together. It's a devastating and threatening disease affecting 300 to 500 millions of people all over the world, and causing death to more than a million of people annually. The risk of severe or fatal malaria is greater in children aged less than 5 years, and therefore the major focus of this work review are precisely the children. In certain African regions, even nearly three thousand children die daily as a result of malaria.

OBJECTIVES AND METHODOLOGY

In this project review, we intend to develop an innovative fresh project to control one of the most dominant main health problems worldwide: malaria. The repellency properties will be conferred through the use of an operation of a specific finishing with the active principle IR3535 in "porous" silica nanoparticles, which allows to repel mosquitoes in contact with the babygrow, thus ensuring long term effective performance, i.e. after multiple washings. This

type of clothing allows not only children where malaria is endemic, but also families, to travel without questioning or worrying about the health of the weakest, thus fully enjoying the trip. The project in question has many benefits for both physical and mental health of these people and for the country itself, as the disease reaches silently, approaching half a billion people around the world. Whether this project is to prevent the incidence of deaths caused by this deadly disease, especially protecting areas where there is high incidence of malaria. This project proposes to be another resource to put and at this disease and its mortality. This work was developed in several stages, some of which are held simultaneously. So we proceeded to the selection of Textiles materials, textile selection of the most appropriate structure, market research level of babygrows design, anti-mosquito repellent application, and finally the implementation of a prototype.

RESULTS AND CONCLUSIONS

It was observed that the most relevant region for this study is Tanzania, due to the behaviour pattern of feeding mosquitoes have changed. This caused the usual preventive measures (nets and insecticides spraying with insecticides) ceased their effects because they can only protect people that are inside houses and/or at night.

It was found during the conceptual research that there are other companies that integrate repellent substances in textile structures, but the major drawback is that these companies impregnate the active ingredient directly onto the fabric with only one linker, or via micro-encapsulation. When the active compound is applied directly (with binder) are required large amounts of the active ingredient, about (200%), which becomes detrimental in terms of toxicology and ecology by moving product to the consumer's skin and the environment. In the case of microcapsules, they release the active ingredient when there is friction. Therefore when the fabric is washed loses much product. So we decided for the impregnation of bamboo fabric, with the repellent IR3535 under the formula of silica nanoparticles "porous". This impregnation is far superior in terms of duration, and toxicology, as the active substance is immobilized in the pores of the nanoparticles. What happens is that the nanoparticles are trapped inside the textile material and not at the surface, as in the case of microcapsules they remain much longer protecting the environment and the user. Therefore, in accordance with the primary objective of this study it was developed a babygrow to be used by children with 6 months old and older, with textiles with functional characteristics that not only repels the insect of malaria, as well as other insects, other multipliers diseases, such as Chagas disease, dengue, yellow fever and leishmaniasis.

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