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THE PHYSIOLOGICAL STATUS OF THE TSETSE FLY, *GLOSSINA FUSCIPES FUSCIPES*, ATTRACTED TO DIFFERENT HOSTS AND CONTROL DEVICES AND ITS IMPLICATIONS FOR CONTROL OF HUMAN AND ANIMAL AFRICAN TRYPANOSOMIASIS

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A dissertation submitted to the faculty of Science, University of the Witwatersrand, Johannesburg, in fulfillment of the requirements for the degree of Master of Science

Johannesburg, 2014

DECLARATION

I declare that this dissertation is my original work. It is being submitted for the degree of Master of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.

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(Signature of the candidate)

27th JANUARY 2014

ABSTRACT

Human African Trypanosomiasis (HAT) is transmitted by *Glossina* species and remains a serious health problem in Africa. Many aspects of control of the disease have been implemented throughout the years but vector control of tsetse flies has proven to be the most efficient long-term solution. Vector control interventions have been implemented for many tsetse species but relatively little is known about the behaviour of the riverine species, *Glossina fuscipes fuscipes*. Increased knowledge of this species would improve vector control interventions. This study aimed at: i) understanding the behaviour of tsetse flies around visual devices and odour baits; ii) understanding the behaviour of the flies with regard to human activities; iii) understanding the interaction between the nutritional status of tsetse flies and their attraction to various trapping devices (biconical traps and electric nets); and iv) establishing an age determination curve for field-caught flies. Results showed that visual targets were better attractants then odour-based ones and electric nets performed better than biconical traps. The sticky traps caught 10x more flies (males) than the stationary biconical traps. Sticky traps caught more young flies than the biconical traps which caught more old flies. An age curve was established for flies ranging from 1 day to 60 days old and the fluorescence-based age determination technique, using pteridine levels, has been shown to work for this species. Understanding the behaviour of tsetse flies around trapping devices should lead to improved trapping efficiency. The data gathered will be of importance in assisting with designing and running the Lake Victoria region control operations planned by PATTEC and it will have application in *G. f. fuscipes* endemic regions in other parts of Africa.