

Dedication

I would like to express my gratitude to my late supervisor Prof Mohamed Musa Mohamed-Ahmed, I dedicate this work to the spirit and any one gave me assistance

Acknowledgement

Firstly, praise to Allah for giving me the health and wellness to complete this work.

Secondly, I would like to express my gratitude to my late supervisor Prof. Mohamed Musa Mohamed-Ahmed.

My thanks are also extended to Prof. Yasir Osman Mohamed who set with me this work, and the rest of the family for their interest, appreciation and devotion all along.

My thanks are also extended to meteorological authority, Administration of Data Services, and to my colleagues in the Umm Banein Animal Production Research Station.

My sincere gratitude goes along to Aba yazeed Abdel, Mohammed Idris and the late Abdul Aziz

I am also deeply to Mohamed Abdul Rahman and Hisham Hussein who helped me in the writing and coordination.

Last and not least my special thanks are to go to my closest friend Faiza fadul Ali for her stubborn and unwavering support all the way to completion of this work.

Abstract

Response of tabanids to unbaited and baited traps was studied during July 2012 to April 2014. Surveys were covered the main vegetations habitats in Ed Damazein, Er Roseries and Umm Banein Localities, using Nzi, Biconical and Vavoua traps. Ed Damazein Locality tabanids comprise of *Atylotus agrestis* (93.28%), *Tabanus taeniola* (6.06%), *T. par* (0.13%), *T. sufis* (0.07%) *T. biguttatus* (0.07%), *Philoliche magretti* (0.26%) and *Haematopota* species (0.13%); tabanids of Er Roseries Locality including *A. agrestis* (83.57%), *A. fuscipes* (6.50%), *T. taeniola* (2.56%), *T. biguttatus* (0.46%), *T. sufis* (0.34%), *Ph. magretti* (6.31%) and *Haematopota* species (0.26%); while Umm Banein Locality tabanids involving *A. agrestis* (80.31%), *T. sufis* (15.69%) and *T. taeniola* (4.13%). The predominant *A. agrestis* together with *T. taeniola* were encountered with different proportion throughout the seasons. The *A. fuscipes*, *T. biguttatus* and *Ph. magretti* were caught during the rainy and cool-dry seasons; *T. sufis* was trapped in both the cool and hot-dry seasons; while *T. par* and *Haematopota* species were only captured in the rainy and cool-dry season, respectively. The majority of the horse flies are abundant during the rainy season. The *A. agrestis* showed bimodal curve of flight; the smaller peak signaling the start of the rain and the higher one at the end of the rainy season and the beginning of the cool-dry season (October- November) in addition to the other species. In general in the Blue Nile region the Nzi trap was always superior to the Biconicals and Vavoua traps trapped significant ($p < 0.5$) more flies including *Ph. magretti*; nevertheless the later traps caught more *T. biguttatus* than the Nzi one. The modified Nzi traps caught more tabanids, yet they were not significantly better than the original Nzi trap. Neither the modified nor the fresh and fermented urine-baited Nzi traps caught significantly more tabanids than did unbaited original Nzi trap.

المستخلص

أجريت الدراسة لاستجابة ذبابة الخيل للجواذب الطبيعية في الفترة من يوليو 2012 الي ابريل 2014. أجرى المسح في معظم الغطاء النباتى بمحليات الدمازين والروصيرص وام بنين باستخدام انواع المصائد (Nzi) و(Biconical) و (Vavoua). وجدت الانواع الاتية من الذباب في محلية الدمازين *Atylotus agrestis* (93.28%), *Tabanus taeniola* (6.06%), *T. par* (0.13%), *T. sufis* (0.07%) *T. biguttatus* (0.07%), *Philoliche magretti* (0.26%) and *Haematopota A. agrestis* (83.57%), *A. fuscipes* (6.50%), species (0.13%); *T. taeniola* (2.56%), *T. biguttatus* (0.46%), *T. sufis* (0.34%), *Ph. magretti* (6.31%) *A. agrestis* (80.31%), *T. sufis* (15.69%) بمحلية ام بنين *Haematopota species* (0.26%) *T. taeniola* (4.13%). فقط. ذباب *A. agrestis*, *T. taeniola* متواجدة خلال الثلاث فصول بنسب متفاوتة، *Ph. magretti* و *A. fuscipes*, *T. biguttatus* مسكت خلال الفصل الممطر والفصل البارد الجاف, تواجدت *T. sufis* خلال الفصل البارد والحار الجاف، بينما وجدت *T. par* و *Haematopota species* على التوالي في الفصل الممط و البارد الجاف. نمط الوفرة للذباب باستعمال مصيدة (Nzi) كانت في الفصل الممطر. نجد ان *A. agrestis* النوع السائد له قمتان للطيران الاصغر في بداية الفصل الممطر و الاعلي في نهاية الفصل الممطر وبداية الفصل البارد الجاف وفي نفس الفترة نجد ان جميع الانواع الاخرى لها قمة نشاط واحدة. سجلت الدراسة بان مصيدة (Nzi) الاعلى فعالية معنويا ضد انواع ذباب الخيل متضمنا *Ph. magretti* من مصيدتى (Biconical) و (Vavoua) الاعلى فعالية ضد نوع *T. biguttatus* . مصائد (Nzi) المعدلة اكثر فعالية من المصيدة الاصل بدون فروق معنوية. اضافة مواد جاذبة شملت بول جديد ومتخمر من حيوانات المزرعة لم تؤثر معنوبا على كفاءة مصيدة (Nzi) الاصل.

LIST OF CONTENTS

CONTENT		Page
Dedication		I
Acknowledgement		Ii
Abstract (English)		Iii
Abstract (Arabic)		V
List of Contents		Viii
List of Tables		Xii
List of Figures		Xx
List of map		Xxii
CHAPTER ONE		
1.	INTRODUCTION	
1.1	General	
1.2	Objective	
1.2.1	Overall objective	
1.2.2	Specific objectives	
CHAPTER TWO		
2.	LITERATURE REVIEW	
2.1	Tabanidae (Horse fly)	
2.2	Classification	
2.3	Distribution of tabanid flies	
2.4	Flight and seasonal abundance of tabanids	
2.5	Diurnal activity patterns	
2.6	Host preference	
2.7	Economic important of tabanids	

2.7.1	Direct effects of tabanids attack	
2.7.2	Disease transmission (indirect effects of tabanids attack)	
2.7.1	Trypanosomosis transmission	
2.7.2	Anaplasmosis transmission	
2.8	Tabanids control	
	CHAPTER THREE	
	MATERIALS AND METHODS	
3.1	Study area	
3.2	Climate	
3.2.1	Metrological data	
3.3	Vegetation covers	
3.4	Horse-flies hosts	
3.5	Traps	
3.6	Attractants	
3.7	Horse flies density and occurrence	
3.8	Trap relative efficiency	
3.8.1	Comparison between the Nzi and Biconical traps	
3.8.2	Comparison between the Nzi, Biconical traps and Vavua traps	
3.8.3	Comparison between the Nzi, Biconical traps and modified Biconical traps	
3.8.4	Comparison between three modifications of the Nzi	
3.8.5	Comparison between unbaited and baited the Nzi trap	
3.9	Data analysis	
	CHAPTER FOUR	
	RESULTS	
4.1	Surveys of biting flies	

4.1.1	Horse flies species diversity and occurrence	
4.1.2	The horse fly species apparent density per trap per region	
4.1.3	Seasonal abundance of the horse fly species	
4.1.4	Trap efficiency	
4.1.4.1	Comparison between the Nzi and Blue Biconical traps	
4.1.4.2	Comparison between the Nzi, Blue Biconical traps and Vavua traps	
4.1.4.3	Comparison between the Nzi, Blue Biconical traps and Turquoise Biconical traps	
4.1.5	Improvement of Nzi trap competence	
4.1.5.1	Response of tabanids to three modification models of the Nzi trap	
4.1.5.2	Response of tabanids to urine-baited Nzi traps	
	CHAPTER FIVE	
	DISCUSSION	
	Recommendations	
	Conclusions	
	References	
	Appendix	

List of Tables		
Table A	Showing the different metrological data of the study area	
Table 1	Shows the prevalence of the different tabanids species caught in the study area	

Table 2		
Table 3		
Table 4	Shows the prevalence of tabanids species caught during different season, in the study area	
Table 5	Shows the seasonal abundance of tabanids species caught in the study area.	
Table 6a	Back-transformed mean catches and catch indices of pooled horse flies in Ed Damazein Locality using Nzi and Blue Biconical traps.	
Table 6b	Table 6_b: Back-transformed mean catches and catch indices of pooled horse flies in Er Roseries Locality using Nzi and Blue Biconical traps.	
Table 7_a	Back-transformed mean catches and catch indices of pooled horse flies in Ed Damazein Locality using Nzi, Blue Biconical and Vavoua traps.	
Table 7_b	Back-transformed mean catches and catch indices of pooled horse flies in Er Roseries Locality using Nzi, Blue Biconical and Vavoua traps.	
Table 8	Back-transformed mean catches and catch indices of pooled horse flies in Umm Bbanein Locality using Nzi, Blue Biconical and Turquoise Biconical traps.	
Table 9	Back-transformed mean catches and catch indices of pooled horse flies in Ed Damazein Locality using three	

	modifications of the Nzi trap and Nzi traps.	
Table 10_a	Back-transformed mean catches and catch indices of pooled Horse flies in Ed Damazein Locality using Nzi trap baited with fresh urine of small ruminant animals.	
Table 10_b	Back-transformed mean catches and catch indices of pooled Horse flies in Ed Damazein Locality using Nzi trap baited with fermented urine of small ruminant animals.	
Table 10_c	Back-transformed mean catches and catch indices of pooled Horse flies in Ed Damazein Locality using Nzi trap baited with fresh urine of large ruminant animals.	
Table 10_d	Back-transformed mean catches and catch indices of pooled Horse flies in Ed Damazein Locality using Nzi trap baited with fremented urine of large ruminant.	
Table 10_e	Back-transformed mean catches and catch indices of pooled Horse flies in Ed Damazein Locality using Nzi trap baited with fresh urine of equines.	
Table 10_f	Back-transformed mean catches and catch indices of pooled Horse flies in Ed Damazein Locality using Nzi trap baited with fermented urine of equines.	

List of figures		
Figure A	Representing the different metrological data	
Figure 1	Nzi trap monthly catches of <i>Atylotus agrestis</i> and <i>A. fuscipes</i> in the Blue Nile area.	
Figure 2	Nzi trap monthly catches of <i>Tabanus taeniola</i>, <i>T. sufis</i>, <i>T. biguttatus</i> and <i>T. par</i>, in the Blue Nile area.	
Figure 3	Nzi trap monthly catches of <i>Philoliche magretti</i> and <i>Haematopota</i> species in the Blue Nile area.	

Appendix		
1	The Nzi tarp (Mihok (2002))	
2	Small ruminates.....fresh urine	