1-Personal information

1.1-Contact information:

Family name	First name	Middle name	Maiden name
Mustafa	Yassir	Osman	Mohamed

Date of Birth	Place	Nationality	Gender
1959 05 13 YY MM DD	Sudan	Sudanese	Male

Marital Status

Married Father of 5 kids

Title

Professor Parasitology **(Medical and Veterinary Entomology)**

Permanent address	Telephone No
Animal Resources Research Corporation (ARRC), P. O. Box 8067, Khartoum Sudan.	+249183460504

Present address	Telephone No
Veterinary Research Institute (VRI) HD: Entomology, Ticks &Tick-borne Diseases	+249155277100

E-mail address	Mobile telephone No
yassir_mohammed59@hotmail.com	249911214014

2-Knowledge of languages:

Mother tong	**Speak**	**Read**	**Write**
Arabic	Fluent	Fluent	Fluent
Working language	**Speak**	**Read**	**Write**
English	Fluent	Fluent	Fluent

2-Education Career

2.1-Academic certificates:

Year attended		**Degree and academic distinctions**	**Main course of study**	**Name, place and country**
From	**To**			
2001	2004	**Ph.D. Degree**	Veterinary Science	Faculty of Veterinary Medicine, University of Khartoum, Sudan,
1985	1987	**M.Sc. Degree**	Insecticides Science	Faculty of Veterinary Science, University of Khartoum, Sudan,
1979	1983	**B.A. Sc., Bachelor's Degree with Merit**	Pesticides Science	Faculty of Agriculture, Al-Azhar University, Egypt.

2.2- Thesis submitted:

1-Ph.D. Thesis entitle

"Relationship between the density of *Glossina fuscipes fuscipes* (Diptera: Glossinidae) and the incidence of Gambian Sleeping Sickness in Bahr El Jebel State, Southern Sudan", Faculty of Veterinary Medicine, University of Khartoum, Sudan.

2-M.Sc. Thesis entitle

"Pharmacotoxicity studies under Sudan conditions", Faculty of Veterinary Medicine, University of Khartoum, Sudan.

2.3- Fellowship:

1- **M.SC Degree** Fellowship of two years duration in **"Insecticides Science"** was awarded by **University of Khartoum**, Sudan, held at the Faculty of Veterinary Science, 1985-87.

2- Fellowship of three month duration was awarded by **ICIPE/EEC** in "**Management of Vector for the Control of Trypanosomiasis and East Coast Fever in Livestock"** as **attachment Research Officer** at **Tick Research Programme of ICIPE**, Nairobi, Kenya, from September to December 1991.

3- **IAEA fellowship** of six months duration in **" Entomology"** held at **IAEA; Department of Nuclear Science and Application; Seibersdorf Labs; Agriculture and biotechnology Lab; Entomology Unit**, Seibersdorf, Austria, from 4th February to 4th August 2003.

4- **NIH Fogarty Center** fellowship of two months duration in **"Tsetse molecular genetics"** as **attachment Research Officer** at **KARI-TRC,** it was afforded as ongoing collaborative programme on capacity strengthening between **Yale University, KARI-TRC, NaLIRRI,** funded by the **NIH Fogarty Center,** 20th April to 20th May 2009.

2.4-Training skills:

Scientific training courses I successfully completed including:

1- **ICIPE/EEC t**raining course in **"Tick Management"** held at ICIPE Labs. Nairobi, Kenya, from 7th May to 7th June 1991.

2- **8th ICIPE/EEC training course on the management of vector for the control of trypanosomiasis and east coast fever in live stock:tick management course** held at Tick Research Programme of ICIPE, Nairobi, Kenya, from 1st September to 3rd December 1991.

3- Cypergate Institute Diploma **"Computer Officer Desk Programmes** including **Microsoft word, Excel, PowerPoint, Access, Databases, Internet; Hardware, Printer, Scanner"** held in Khartoum, Sudan, from 1st to 31st May 2001.

4- **EANETT "GIS training course"** Organized by KETRI/Gath/EANETT, held at TRC, Muguga, Nairobi, Kenya, from 28th July to 9th August 2001.

5- **FAO** training course in **"Tsetse, Trypanosomosis Surveillance and Control"** Organized by CVRL/ FMAR, held at Soba, Khartoum, Sudan, from 1st to 6th May 2001.

6- **ARRC** training course in **"Applied statistics"** held at Animal Production Research Labs, Kuku, Khartoum, Sudan, from 1st to 14th September 2002.

7- **IAEA** Training through fellowship of six months duration in "

Entomology" held at IAEA; Dep. Nuclear Science and Application; Seibersdorf Labs; Agriculture and biotechnology Lab; Entomology Unit, Seibersdorf, Austria, from 4th February to 4th August 2003.

8- **EANETT** training course in **"Diagnosis of Trypanosomoses using PCR technique"** held at KTRI, Nairobi, Kenya, from 1th to 30th November 2004.

9- **HAT Platform** training course in **"Best Practices in Ethical review"** Organized by the **HAT Platform** in collaboration with **DNDi, GCP Alliance-Europe, TMRI** funded by **EU, 6th framework programme,** held at Meridian Khartoum Hotel, Sudan, from 24th to 26th July 2007.

10- **Ministry of Science and Technology, Sudan Academy of Sciences,** training course in **"Mathematical Modeling in Life Science"** held at **Sudan Academy of Sciences**, from 1st to 14th December 2008.

11- **NIH Fogarty Center** two months attachment training **in "Tsetse molecular genetics"** held at **KARI-TRC,** The training was afforded as ongoing collaborative programme on capacity strengthening between Yale University, KARI-TRC, NaLIRRI, funded by the NIH Fogarty Center, 20th April to 20th May 2009.

12- **KARI-TRC** training course in **"Molecular Biology"** held at **TRC Labs ,**Muguga, Kenya, from 11th July to 13th July 2009.

13- **NCR-TMRI/ Ministry of Sciences & Technology** training course in **"Molecular biology approaches: identification of vectors and the related parasities"** held at **TMRI,** Khartoum, Sudan, from 20-27th April 2011.

14- **Makerere University/Bill & Melinda Cates Foundation** training course in **"Molecular Diagnostics Techniques for Detection of Trypanosomes in Tsetse flies"** held at **Makerere University,** Kampala, Uganda, from 2-6th May to 2011.

3-Employment record

3.1- Duration, title and type of business:

From	To	Title: Research Professor
2011	date	**Type of business: Head**: Department Entomology & Ticks, Veterinary Research Institute (VRI), Animal Resources Research Corporation (ARRC).
From	**To**	**Title: Research Associate Professor**
2009	2011	**Type of business: Research Officer**; Department Entomology & Ticks, Central Veterinary Research Laboratories Center (CVRL), Animal Resources Research Corporation (ARRC).

From	**To**	**Title: Research Associate Professor**
2004	2009	**Type of business: Director:** Blue Nile State Regional Veterinary Research Laboratory, ARRC.
From	**To**	**Title: Research Associate Professor**
2002	2004	**Type of business**: **Study course for Ph.D. Degree,** Preventive Medicine, Faculty of Veterinary Medicine, University of Khartoum, Sudan.
From	**To**	**Title: Research Assistant Professor**
1997	2001	**Type of business: Head Department**: Entomology, Tick and tick-borne Diseases &Tsetse and Trypanosomosis Control, CVRL, ARRC.
From	**To**	**Title: Research Assistant Professor**
1993	1997	**Type of business: Head Department:** Entomology & Tick and Tick-borne Diseases, CVRL, ARRC.
From	**To**	**Title: Research**.
1987	1993	**Type of business: Research Officer:** Entomology & Tick and Tick-borne Diseases, CVRL, ARRC

3.2-General duties description:

Holds administration issues to ensure the visibility and impact of the research activities. Acts and supervises activities for plan, implement, and coordinate entomological applied research aspects regarding epidemiology of arthropod-borne diseases, control, trapability, taxonomy, biology, ecology of arthropod of veterinary significance. Apply quality control bioassay test for control methods and devices performance. Conducts, apply and contribute in training sessions held in the field of entomology to transfer technology and strengthening capacity. Provides technical strategic advice about vectors control through designing sustainable and environmentally friend strategies. Analyzes and disseminate the data through the public information channels.

3.3- Promotion status:

1-1987 I was promoted to Research Officer

2-1993 I was promoted to Research Assistant Professor Officer

3-2002 I was promoted to Research Associate Professor Officer

4-2011 I was promoted to Research Professor Officer

4-Scientific Activities

4.1-Projects for research and control activities:

I have conducted, implemented and contributed in the following projects for research and control regarding arthropod vectors and vector-borne diseases in the Sudan.

a- **Principal Investigator** for the following projects:

1-**Tick and Tick-borne Diseases Control Plan in Khartoum State, Sudan,** CVRL/MANAR, 1994.

2- **Population dynamics, structure, mortality rates and feeding behavior of *Glossina* spp (Diptera: Glossinidae), Equaroria State.** Project No. ID 990917, T16/181/530 funded by **TDR/WHO (2000-2001).**

3-**Use of molecular diagnostic technique (PCR) in detection of trypanosomes in tsetse flies 2006-2009,** funded by **EANETT/NCR.**

4-**Comparative population structure and phylogeography of trypanosomes and their tsetse fly vectors,** funded by **BeCANET,** Grant 2/2007 CIDA September 1st 2007 to March 30th 2009.

b**- Co-Principal Investigator** for the following projects:

1-**Mapping out of sleeping sickness foci in Juba region, Sudan**, funded by CDS/CSR/EPHC/WHO 2000-20001**.**

2-**Role of agro-pastoral sector and domestic animal as reservoir in eipemiology of sleeping sickness in Baher El Jebal State, Southern Sudan, supported by EANETT 2002-2006.**

3-**Bionomics of mosquito in relation to transmission of lymphatic filariasis and malaria in the Blue Nile State, Sudan,** funded by **TMRI/NCR**.

4-**Development and Application of Xenomonitoring Tools in Human African Trypanosomiasis Control Programmes in Endemic Countries**

4.2- Protocol and Mandates:

I have contributed and conducted the following protocol and mandates:

1-Tick and Tick-borne Diseases Control Strategy in Khartoum State, Sudan, CVRL/MARF, 1994.

2-Procedures and regulations governing research for registration veterinary pesticides in the Sudan, CVRL/MAR, 1999.

3-Development of a National Sustainable Integrated Tick and Tick-borne Diseases Research and Control Programme in the Sudan, CVRL/ARRC.

4-Development of a National Sustainable Integrated Tsetse and Trypanosomosis Research and Control Programme in the Sudan, CVRL/ARRC.

5-EANETT, 2005, **Standardization Protocols for:**

1- Trypanosomes isolation, drug sensitivity and characterization

2- Vector, animal and human sampling in Human African Trypanosomosis.

6- Ed Damazine Veterinary Research Laboratory (DVRL) Protocols for research objectives and activities.

7- Entomology Department Mandate (VRI) for research objectives and activities, 2011.

8- National Sustainable Integrated Tick and Tick-borne Diseases Control Strategy in the Sudan, VRI/ARRC, 2011.

5-Capacity building

I have contributed and conducted the following activities to facilitate conductive atmosphere for creative research and training sessions to enhance the personnel carrier and skill.

5.1-Rehabilitation of Ed Damazine Veterinary Research Laboratory, Blue Nile State:

With the Government-Blue Nile State sponsor I have been able to renovated the Ed Damazine Veterinary Research Laboratory to consists **four Departments of Microbiology, Parasitology, Biochemistry and Fisheries** each of two laboratory rooms and one office, altogether with two **Administration offices** in order to: Facilitate an atmosphere conductive to organize fruitful research activities. That is expected to improve veterinary services and hence improvement of animal health and production.

5.2- Training session:

I fully participated in executing and organizing the following training sessions to build up a core of well trained personnel to execute and sustain proposed goals:

1-Practical Action-Sudan, Blue Nile Programme, Ed Damazine office, **five days refresher training** for 19 Community Animal Health Workers (CAHWs) from 5th to 9th March 2009 held at Ed Damazine Regional Veterinary Research Laboratory.

2- Mubadiroon Organization for Prevention of Disaster and War Impacts, Blue Nile Branch/**EU** a training session in **the Sustainability of Natural Resources** for 29 NGOs and GOs representatives from 21th to 25th March 2009 held at Ed Damazine Regional Veterinary Research Laboratory.

3- Mubadiroon Organization for Prevention of Disaster and War Impacts, Blue Nile Branch/**FAO**, training course **in the farm animals ecto-parasite management** for 19 Community Animal Health Workers (CAHWs) from 21th to 27th April 2009 held at Ed Damazine Regional Veterinary Research Laboratory.

4- **National Malaria Control Project/ Federal Ministry of Health**, training course **in Procedures and Methodology of Entomological Survey,** for 24 Health officers from 21th to 27th March 2011 held at Professor Gadal Center, Sinnar State.

5- NCR-TMRI/ Ministry of Sciences & Technology, training course in **"Molecular biology approaches: identification of vectors and the related parasities"** for 20 Health employees held at **TMRI,** Khartoum, Sudan, from 20-27th April 2011.

6- Epiezootic and Animal Health Administration/ Federal Ministry of Animal Resources and Fisheries, training course in **Procedures and Methodology of Entomological Survey** for 24 Veterinarian Officers from 1-5th May 2011 held at **Epizootic and Animal Health Administration hall and Entomology & Tick Department laboratories/**Veterinary Research Institute (**VRI)**.

7- A Course on **Vectors Identification/ General Directorate of Laboratories and Medical Researches/ Federal Ministry of Health, a** training session in **Ixodoidea and *Glossina* taxonomy, classification, biology, ecology and sampling procedures,** from 11th to 15th November, 2012 for 15 Research Officers held at **Medical Entomology Department, National Health Laboratories Center, Khartoum, Khartoum State, Sudan.**

8- National Course on **Vectors Surveillance and incrimination/ WHO/ National Malaria Control Programme** held at **Prof. Elgadal National Malaria Research and Training Center, Sinnar, Sudan** for consecutive years **2011-2015. A** training session in "**Procedures and Methodology of Entomological Survey"** for a group **of 25 Health Officers/year**.

5.3- Post graduate Education:

5.3.1- Supervisor and co-supervisor:

1 **Yousif, E. D.,** in 2011 has been **awarded M. Sc Degree** in field of Zoonotic Diseases, Sudan Academe of Science. Thesis entitles **"Bionomics of mosquito in relation to transmission of lymphatic filariasis and malaria in the Blue Nile State, Sudan".**

2 **Mohamed, A. B**., in 2011 has been **awarded M. Sc Degree** by courses in Medical Entomology, Sudan Academe of Science. Dissertation titled "**Detection of trypanosomes in *Glossina fuscipes fuscipes* (Diptera Glossinidae) using polymerase chain reaction (PCR) technique in the Blue Nile State, Sudan".**

3 **Amar M. A**., in 2013 has been **awarded M. Sc**, in field of **Veterinary Parasitology, Option Tick-borne Diseases**, Faculty of Veterinary Medicine, Sudan University for Sciences and Technology, 2013. Thesis entitles "**Prevalence of Bovine Anaplasmosis in Khartoum State, Sudan**".

4 **Mohamed E. T**., in 2014 has been **awarded Ph. D** in field of Veterinary Entomology, Sudan Academe of Science,. Thesis entitle **"Resistance of ixodid ticks to acaricides in Khartoum State"**.

5 **Maria, G.,** in 2012 **registered** for **M. Sc**, in field of **Veterinary Parasitology, Option Tick-borne Diseases**, Faculty of Veterinary Medicine, Sudan University for Sciences and Technology, The study entitles "**Trapability** of peri-urban population of **horseflies** (Diptera: Tabanidae) in the Blue Nile county, Sudan". (ongoing)

6 **Rawia E. A**., 1n 2013 **registered f**or **M. Sc**, in field of **Technical Quality Control of Diagnostic Tools**, Sudan Academy of Sciences. The study entitles "**Estimation of efficiency, sensitivity and accuracy of indirect ELISA for detecting *Theileria annulata* infections in cattle**". (ongoing)

7 **Manal, M.O.,** in 2014 **registered** for **M. Sc**, in field of **Technical Procedures for Insecticides Residual Analysis**, Sudan Academy of Sciences. The study entitles "**Detection of cypermethrın residues in cow's milk at Khartoum State using HPLC"** (ongoing)

8 **Mohamed E. M. A,** in 2014 **registered** for **Ph. D**, in field of Epidemiology**,** Sudan Academy of Sciences. The study entitles **"Epidemiology, Molecular Diagnosis and Genotyping of *Trypanosoma evansi* Infecting Camels (Camelus dromedarius) in Jazan Region, Saudi Arabia".** (ongoing).

5.3.2- External Examiner:

Number	Degree	Institution	Field
4	**M. Sc**	Sudan Academe of Science,	Medical Entomology
5	**M. Sc**	Faculty of Science, University of Khartoum, Sudan.	Medical Entomology
1	**M. Sc**	Faculty of Veterinary Medicine, Sudan University for Sciences and Technology	Medical Entomology
2	**Ph. D**	Faculty of Science, University of Khartoum, Sudan	Medical Entomology
1	**Ph. D**	Sudan Academe of Science,	Medical Entomology

5.3.3- External Lecturer:

Number	Degree	Institution	Field
Consecutively Groups (2008-2011).	**M. Sc** by course	Blue Nile National Institute for Communicable Diseases, Faculty of Medicine, University of Gezira	Medical Entomology

6- Social affairs

6.1-Professional association:

List of membership of professional association, societies and international affairs:

1- **Sudanese Agriculture Association since 1987**

2- **Sudan National Pesticides Council since 1989**

3- **Eastern Africa Network for Trypanosomosis (EANETT) since 2000.**

4- **Ethics Committee HAT Platform/TMRI sine 2007**

6.2-National Development Programmes:

I fully participated in organizing and executing **the National Currency Replacement Programme** as a **member** of the **Regional Committee** of the **Blue Nile State**, Sudan.

7-Conferences and workshops

7.1-Conferences and workshops held from 1991-2001:

1 **Code of Atlas in the use of Pesticides**, **FAO/CPD/MANAR**, held in Khartoum, Sudan, 19th to 20th August 1991. **I participate** by a paper titled **"The use of insecticides in the control of pests of veterinary importance."**

2- **Animal Resources Development Conference, ARC/MANAR,** held in Wad Medani, Sudan, August 1992. **I participate** by a paper titled **"Strategies of tick control in Gezera Irrigated Scheme".**

3- **Use of non-chemical Materials for Controlling Pests Workshop, NRC/ASRUC/AOAD,** held in Khartoum, Sudan, from 6th to 8th February 1993. **I presented** a paper titled **"Non-chemical control of animal pests".**

4- **Bovine Tropical Theileriosis Workshop, VRA/MANAR,** held in Khartoum, Sudan, from 4th to 5th May 1994. **I participate** by a paper titled **"Tick control using acaricides".**

5- **AOAD/ICIPE/Sudan Workshop for Scientific Cooperation**, 1st to 3rd December 1997, Khartoum Sudan. **I participate** by a paper titled **"Livestock pest problem in the Sudan".**

6- **8th Arab Veterinary Conference, SVA/MANAR,** held in Khartoum, Sudan, from 24th to 28th March 1998. **I presented** a paper titled **"Tick and tick-borne diseases survey in Khartoum State".**

7- **4th Scientific Conference, NCR/FHST**, held in Khartoum, Sudan, from

8th to 10th April 1999. **I participate** by two papers titled **"Prospects of tsetse and trypanosomosis control in Sudan"** and **"Strategies of tick and tick-borne diseases control in Sudan".**

8- **26th ISCTRC Meeting,** held in Ouagadougou, Burkina Faso, from 1st to 5th October 2001. **I presented** a paper titled **"Some observation on ecology of *Glossina fuscipes fuscipes* in Bahr EL Jebel State, Sudan".** Publication No 120: 176-183.

7.2-Conferences and workshops held from 2002 to date:

9- **4th Annual EANETT Workshop,** held at Rock Classic Hotel Tororo, LIRI, Uganda, from 26th October to 3rd November 2002. **I presented** two papers titled **"Studies on the prevalence of sleeping sickness in Southern Sudan"** and **"Present tsetse situation in Bahr El Jebel State, Southern Sudan".**

10- **27th ISCTRC Meeting**, held in Addis Ababa, Ethiopia from 1st to 5th October 2003**. I presented** a paper titled **"Updating the situation of sleeping sickness in Bahr El Jebel State, Southern Sudan ".** Publication No122: 229-233.

11- **6th Annual EANETT Workshop,** held at HOLIDAY Villa hotel Khartoum, TMRI, Sudan, from 29th November to 2ed December 2004. **I presented** three papers titled **"Factors causing impact on sleeping sickness transmission in Bahr El Jebel State, Southern Sudan"** and **"The role of cattle as reservoir host for sleeping sickness in Bahr El Jebel State, Southern Sudan"** and **"Trapability of *Glossina fuscipes fuscipes* (Diptera: Glossinidae) in Juba area, Bahr El Jebel State, Southern Sudan".**

12- **28th ISCTRC Meeting,** held at White Sandstone Hotel, Mombasa, KARI, Kenya, from 14th to 18th November 2005. **I participate** by a paper titled **"Responses of *Glossina fuscipes fuscipes* (Diptera: Glossinidae) to traps in Juba, Southern Sudan".** Publication No123: 509-516.

13- **7th Annual EANETT Workshop,** held at White Sandstone Hotel, Mombasa, KARI, Kenya, from 16th to 18th November 2005. **I presented** three papers titled **"The socio-economic characteristics of population under sleeping sickness risk and their knowledge about the disease in Bahr El Jebel State, Southern Sudan"** and**" Evaluation of *Trypanosoma brucei* species infecting *Glossina fuscipes fuscipes* (Diptera: Glossinidae) and Stomoxys flies in the Southern Sudan using PCR technique"** and **"Identification of *Trypanosoma spp* infecting cattle by PCR technique in Bahr El Jebel State, Southern Sudan".**

14 **4th Regional Sleeping Sickness Meeting,** held at Juba, Sudan, from 25th to 27th July 2006. **I presented** a paper titled **"Tsetse fly mapping in Equatoria Region".**

15- **Best Practical in Ethical Review, a workshop for members of Ethics Committees**, held at Meridien,Sudan, from 21-26 July,2007.

16- **8th NCR Scientific Conference, Endemic and emerging Diseases: New trends in diagnosis and Control,** from 21st to 23rd August 2007, held at Khartoum Friendship Hall, Khartoum, Sudan. **I presented** a paper titled **"Detection of *Trypanosoma brucei gambiense* and *T. b. rhodesiense* in *Glossina fuscipes fuscipes* (Diptera: Glossinidae) using the polymerase chain reaction (PCR) technique in southern Sudan".**

17- **NEPAD/BeCANet Stakeholders Workshop on Tsetse and Trypanosomiasis (T&T) Research, Organized By KARI-TRC** at the Silver Springs Hotel, Nairobi, Kenya From 18-19 September 2007. **I presented** a country report titled **"Trypanosomoses, tsetse and other insect vectors situation in the Sudan".**

18- **10th Annual EANETT/BeCANet Workshop,** held at White Sandstone Hotel, Mombasa, KARI, Kenya, from 25th to 27th November 2008. **I presented** a paper titled **"The current tsetse geo-distribution in the Blue Nile State, Sudan".**

19- **BecANet Annual Meeting** held at Tsetse and Trypanosomiasis Research Institute in Tanga, United Republic of Tanzania, from 10th to 12th December 2009, **I reviewed the final report of project No 2/2007.**

20- **Development and Application of Xenomonitoring Tools in Human African Trypanosomiasis Control Programmes in Endemic Countries Workshop/** Makerere University/Bill and Melinda Cates Foundation, in February 2009, held at Makerere University Kampala, Uganda.

21- **BMC/ Makerere University** workshop on **Molecular Diagnostics Techniques for Detection of Trypanosomes in Tsetse flies,** held at **Makerere University,** Kampala, Uganda, from 2-6th May to 2011.

22- **Ticks and Tick-borne Diseases Control Strategy Workshop, VRI/ ARRC/FMARF,** held at Professor Mohamed Taher Meeting Hall in VRI, Khartoum, Sudan, 14th November 2011. **I participate** by a paper titled **"Strategy for tick control ".**

23 Annual Consortium Meeting of **Development and Application of Xenomonitoring Tools in Human African Trypanosomiasis Control Programmes in Endemic Countries** Workshop/ **Makerere University/Bill and Melinda Cates Foundation**, held at Lilongwe, Malawi, from 23rd to 26th September 2012. **I represented** a Narrative Report on **"Xeno-monitoring Research Project in Sudan"** and a paper titled **"Report of Sudan**".

24 The **2nd EANETT/HAT Platform Scientific Conference on African Trypanosomiasis and Neglected Tropical Diseases**, held at Panafric Hotel, Nairobi, Kenya 03 – 05th June, 2013. **I participate** by a paper **titled "**Tsetse distribution and land use, Blue Nile State, Sudan".

25 The **3rd EANETT/HAT Platform Scientific Conference on African Trypanosomiasis and Neglected Tropical Diseases**. Targeting Elimination of HAT "**The role of Research and Development"** held in Kinshasa, DRC 17 – 19th September, 2014. I participated by a poster titled "Mapping of tsetse fly distribution and detection of *Trypanozoon* trypanosome infections on *Glossina fuscipes fuscipes* (Diptera: Glossine) using polymerase chain reaction (PCR) technique, Blue Nile State, Sudan."

8-Publications

8.1-Publications from 1991-2001:

1- A.A.A. Aziz; **Y.O. Mohammed** and O.M. Osman (1991), "The susceptibility of the soft tick *Ornithodoros savignyi* (Ixodoidea: Argasidae) to some acaricides.", Sudan J. Vet. Sci. Anim. Hus., 30(2)17-21.

2- O.M. Osman**; Y.O. Mohammed** and I.S. Abdul Salam (1991), "The use of pesticides in the control of pests of veterinary importance in the Sudan." The Workshop on Code of Atlas in the use of Pesticides, FAO/CPD/MANAR, Khartoum, Sudan, 19th to 20th August 1991 (Ed. H. Abbas and G. Zurkanee) pp1- 8.

3- **O. M. Yassir**; O.M. Osman and T.H. El Amin (1992), "Life cycle studies of the tick species, *Amblyomma lepidum*, *Hyalomma anatolicum anatolicum* and *Rhipicephalus evertsi evertsi* under laboratory conditions." Insect Sci. Applic., 13(4)565-568.

4- **Y.O. Mohammed** and O.M. Osman (1992), "Strategies of tick control in Gezera Irrigated Scheme." CARD/MANAR, 17th to 19th August 1992: pp 1- 12.

5- O.M. Osman; **Y.O. Mohammed** and A.H. A/Rahman (1993), "Non-chemical control of animal pests." NRC/ASRUC/AOAD, 6th to 8th February 1993:53-67.

6- **Y.O. M. Mustafa**; O.M. Osman and A.A. A. Aziz (1993), "Studies on deltamethrin (Butox) acaricidal action on ixodid tick species under Sudan conditions." Sudan J. Vet. Res., 12, 21-32.

7- **Y.O. Mohammed**; O.M. Osman and A.A. A. Aziz (1993), "Efficacy of Ranatik C_5 (cypermethrin) and Ranatik D_{15} (diazinon) against *Hyalomma anatolicum anatolicum* (Ixodoidea:Ixodidae)." Sudan J. Vet. Sci. Anim. Husb., 32(1-2)50-55.

8- A.A.A. Aziz; **Y.O. Mohammed** and El Ham, M.O. (1994), "Tick chemical control by using acaricides." Bovine Tropical Theileriosis Workshop, VRA/MANAR, (Ed. A.M. Mannan and S.M. Kheir) 4th to 5th May 1994:52-65.

9- S.M. Ali; S.M. Kheir; A.A.A. Aziz; **Y.O. Mohammed;** M.E. Lemia and S. M.El Amin (1994), "Theileriosis scientific research problems in the Sudan." Bovine Tropical Theileriosis Workshop, VRA/MANAR, (Ed. A.M. Mannan and S.M. Kheir) 4th to 5th May 1994:73-78.

10- S.M. Ali and **Y.O. Mohammed** (1994), "Effect of Amitraz on reproductive capacity of *Hyalomma anatolicum anatolicum* (Ixodoidea: Ixodidae)." Sudan J. Vet. Res., 13, 35-39.

11- **Y.O. Mohammed**; O.M. Osman and T.H. El Amin (1995), "Effect of chlorpyrifos at sub-lethal dose on biotic potential of *Rhipicephalus evertsi evertsi* (Ixodoidea: Ixodidae)." Sudan J. Vet. Res., 14, 51-60.

12- M.T. Musa; A.E. Bashar and **Y.O. Mohammed** (1996), "Heart water in cattle in Western Sudan: Aetiology and ecology observation on two outbreaks." Sudan J. Vet. Sci. Anim. Husb., 35(1-2)113-123.

13- S.M. Kheir; A.A.A. Aziz; **Y.O. Mohammed** and A.A. Latif (1997), "Livestock pest problem in the Sudan." AOAD/ICIPE/Sudan Workshop for Scientific Cooperation, 1st to 3rd December 1997, Khartoum Sudan.

14- **Y.O. Mohammed**; A.A.A. Aziz and S.M. Kheir (1998), "Tick and tick-borne diseases survey in Khartoum State." Sudan J. Vet. Sci. Anim. Husb., 37(2)282-289.

15- **Y.O. Mohammed**; A.A. Ismail; S. Sawsan; A.A.A. Aziz and S.M. Kheir (2000), "Prospects of control of tsetse and trypanosomiasis in Sudan." Al Buhuth J., 8(1)72-86.

16- A.A.A. Aziz; M.O. El Ham; M.E. Lemia; S.M. Kheir and **Y.O. Mohammed** (2000), "Strategies for control tick and tick-borne diseases in Sudan." Al Buhuth J., 8(1)87-101.

17- **Y.O. Mohammed;** M.M. Mohamed-Ahmed; E.R. Intisar; M.S. Suaad and K.H. El Malik (2001), "Some observation on ecology of *Glossina fuscipes fuscipes* in Bhar El Jebal State, Sudan." ISCTRC Publication No 120: 176-183.

8.2-Publications from 2003 to date:

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1- Intisar, E.; **Mohammed, Y.O.**; Rhaman, M.M.; Khali, M.K.; Suad, M.S.; El Malik, Kh.H. (2002), **"Studies on the prevalence of sleeping sickness in Southern Sudan"** 4th Annual EANETT workshop, Tororo, Uganda, Octobar27 to November 02, 2002.

2- **Mohammed, Y.O.**; Mohamed-Ahmed, M.M.; El Malik, K.H.; Suad, M.S.; Intisar, E. (2002), **"Present tsetse situation in Bahr El Jebel State, Southern Sudan"** 4th Annual EANETT workshop, Tororo,

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3- **Mohammed, Y.O.**; Mohamed-Ahmed, M.M.; Intisar, E. (2004), **"Factors causing impact on sleeping sickness transmission in Bahr El Jebel State, Southern Sudan"** 6th Annual EANETT Workshop, Khartoum, Sudan, from 29th November to 2ed December 2004.

4- Mohamed, T.A.; El Malik, K.H.; **Mohammed, Y.O.**; Intisar, E. (2004), **" The role of cattle as reservoir host for sleeping sickness in Bahr El Jebel State, Southern Sudan"** 6th Annual EANETT Workshop, Khartoum, Sudan, from 29th November to 2ed December 2004.

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6- Osman, H. M.; Rahman, M. M.; **Mohammed, Y.O.;** Intisar, E. (2005), **"The socio-economic characteristics of population under sleeping sickness risk and their knowledge about the disease in Bahr El Jebel State, Southern Sudan"** 7th Annual EANETT Workshop, Mombasa, Kenya, from 16th to 18th November 2005.

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10- Reports

a- Eastern Africa Net for Trypanosomosis (EANETT):

1- **"Research activities in the southern Sudan". EANETT** Stakeholders Workshop on Tsetse and Trypanosomiasis (T&T) Research, Mombasa, Kenya, from 16th to 18th November 2005.

b- Biosciences Eastern and Central Africa Net (BecANet):

1- **"Human African Trypanosomosis and its Vectors in the Sudan".** BecANet Stakeholders Workshop on Tsetse and Trypanosomiasis (T&T) Research, Nairobi, Kenya From 18-19 September 2007.

2- **Mohammed, Y.O.** (2009)**, "Studies on tsetse flies, Yabus county, the Blue Nile State, Sudan".** NEPAD/BeCANet Annual Meeting, Tanga, United Republic of Tanzania, from 10th to 12th December 2009.

11-References

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Professor: **Osman Mansour Osman**.	Department Parasitology, Faculty of Medicine, El Neelain University .	**Lecturer Professor**

1-Ph.D. Thesis entitle

"Relationship between the density of *Glossina fuscipes fuscipes* (Diptera: Glossinidae) and the incidence of Gambian Sleeping Sickness in Bahr El Jebel State, Southern Sudan".

Abstract

In the first part of the thesis the results of a surveillance of a Gambian type of Human African Trypanosomosis (sleeping sickness, HAT) conducted in Juba area (Latitude 4º 40⁻-5º N and Longitude30º 30⁻- 31º 45⁻ E) between January 2002 and December 2003 were presented. At each selected location in the latter area, fresh blood samples from each consenting individual were initially screened for *Trypanosoma brucei gambiense* antibodies using the Card Agglutination Test for Trypanosomosis (CATT). About 257 (11.1%) out of 2322 individuals were sero-active by CATT. These sero-positives were tabulated according to gender, age group, occupation and location. The sero-positive rate in the pooled adults (males +females) (11.9%), although relatively high, was marginally insignificant compared with that of the pooled children (male + female) (9.1%). The adult females' sero-prevalence rate (16.98%) was significantly higher than that of adult males (9.45%), male children (9.75%) and female children (8.41%). In contrast, there were no significant differences in the sero-prevalence rates between men and male or female children. The internally-displaced group and the military personnel showed statistically higher sero-positive rates when compared with resident groups regardless of the presence or absence of the only extant tsetse species, *G. f. fuscipes*. The proportions of sero-positives differed significantly between locations in the study area. The latter discrepancy was attributed to the presence/absence of tsetse and/or the presence as well as the proportion of the internally-displaced people and the Government soldiers in each location. Furthermore, the pooled respondents examined along the riverine vegetation had a statistically higher encounter with the disease (18.6%) compared with those in the derived savanna woodland (7.04%) and the open savanna woodland (4.93%). This was explained on the basis of concentration of the vector tsetse along the riparian habitats and its corresponding absence in savanna vegetations. In the follow-up of the sero-positive individuals using direct trypanosome diagnostic techniques including wet preparations of blood, lymph node aspirates and cerebrospinal fluid, microhaematocrit and mini-anion exchange centrifugation techniques, only three individuals were found to harbour motile trypanosomes.

In the second part of the thesis the experiments with the blue-white biconical trap, a well-known riverine tsetse trap, the Epsilon trap, a well-known savanna tsetse trap were reported. Only *G. f. fuscipes* was caught in any one trap with the biconical trap about six times more effective than the Epsilon trap. There were no significant differences between trap catches in the proportions of tenerals in males or females or the sex ratio of tenerals and non-teneral flies. Further experiments with the simpler biconical trap modifications, namely the monoscreen and Vavoua traps, revealed that the modified versions were much less effective than their original progenitor. Since the blue-white biconical trap had proved to be highly effective against *G. f. fuscipes*, an experiment was conducted to further improve the efficiency of this design. In this experiment an upper black netting cone and a lower heavy drill blue cotton cone were used instead of the matt blue cotton and the white netting upper cone. These three modifications of the trap were compared together with the new Nzi trap. The latter trap was presumed to be effective against all tsetse species and

many species of biting flies (Mihok, 2002). The results showed that all three versions of the biconical trap were significantly better than the Nzi trap against *G. f. fuscipes*.

In the third part of the thesis the results of a tsetse survey to determine the tsetse distribution in the study area during the dry and wet seasons were presented. Whenever possible, the locations surveyed for tsetse were the same as those in which the inhabitants were screened for Gambian sleeping sickness. The results showed that only *G. f. fuscipes* existed in the study area mainly in riverine habitats along River Bahr El Jebel and other watercourses. Flies were absent in villages and the savanna vegetations away from watercourses. Trap catches were significantly higher during the wet season than in the dry season although flies could be caught in any one location during both seasons. Maps generated from this survey suggested a further northern advance of *G. f. fuscipes* of about 29 and 48 km along River Bahr El-Jebel and River Luri, respectively.

In the fourth part of the thesis an endeavour was made to find out the relationship between the density of *G. f. fuscipes* in each location and the sero-prevalence rate of *T. b. gambience* in the same location using linear regression analysis. Analysis showed that there was no significant correlation between the density of *G. f. fuscipes* defined as the mean catch of tsetse /trap/ day and the sero-prevallence rate (%) of HAT in the inhabitants in Juba area, Southern Sudan.

The above results are discussed in relation to the possibility of conducting active Gambian sleeping sickness surveillance in times of raging civil strife. Thus the present study during its follow-up part had detected trypanosome-infected individuals and other suspects who were referred to Juba teaching hospital for adequate treatment and other medical care. Experiments with traps showed that traps developed for savanna tsetse were ineffective against *G. f. fuscipes* and that the conventional blue-white biconical trap remains the most effective against this species. The finding that *G. f. fuscipes* has advanced up to roughly 50 km to the north suggests that the current war has disrupted normal human agricultural activities. Thus, the lack of regular clearing for cultivation might have lead to the regeneration and proliferation of riverine bush to the north making it suitable for tsetse to advance and occupy more arable lands. The fact that there was no relationship between the fly density and the incidence of sleeping sickness in the area suggests that a few tsetse flies may perpetuate Gambian sleeping sickness at epidemic proportions. This meant that tsetse in endemic foci of sleeping sickness such as exists in Southern Sudan should be completely eliminated.

2-M.Sc. Thesis entitle

"Pharmacotoxicity studies under Sudan conditions", Faculty of Veterinary Medicine, University of Khartoum, Sudan

Abstract

The biological development of three livestock tick species was dealt with under laboratory conditions. *Amblyomma lepidum* adopted a 3-host type of development. The larvae and nymphs were fed on rabbits and the adults on calves ears. At 27 ± 1 ºC and 100% R.H., the length of the life cycle was 146-175 days, egg, 40-48 days; larvae, 34-40 days, nymphs 34-42 days; adults, 38-54 days. *Hyalomma excavatum* developed as 3-host

while *Rhipicephalus evertsi* behaved as 2-host on rabbits. At 27 ± 1 ºC and 75-80% RH, the oviposition period of *H. excavatum* and *R. evertsi* was 4.5 and 5.5 days, respectively. The eggs lasted within 32-39 days for *H. excavatum* and 25-31 for *R. evertsi.* The larvae and nymphs of *H. excavatum* fed for 4 and 6 days, and moulted after a further 8.5 and 13 days, respectively, females fed for 8.5 days. Larvae and nymphs of *R. evertsi* fed sequentially on the same host for 14 days and engorged nymphs moulted after 14 days. Females of *R. evertsi* fed and dropped after 7.5 days. Using the packet test method, the susceptibility of *H. excavatum* and *R. evertsi* to 6 organophosphorus ixodicides was determined. When the results were subjected to a probit analysis programme, homogeneous responses were obtained except for coumaphos against *H. excavatum* and dioxathion against *R. evertsi* which showed a high degree of heterogenecity. Two chemicals (dimethoate and Diptrex) caused 100% mortality of *H. excavatum* at all range of concentrations used. LC_{50} values of chlorpyrifos, dimethoate Diptrex, Tamron, coumaphos and dioxathion for *R. evertsi* were, 0.016%, 0.0196%, 0.0246%, 0.0263%, 0.0346% and 0.0767%, respectively, and those of chlorpyrifos, Tamron and coumaphos for *H. excavatum* were 0.0072%, 0.0078% and 0.0313%, respectively. Chlorpyrifos used as a topical application, at sublethal level has biocidal effects against *H. excavatum* immature stages. The chemical affected the developmental rate of *H. excavatum* by increasing the moulting period of treated larvae, the feeding and moulting periods of ticks developing from the treated larvae. Nymphs that emerged from treated larvae and adults developing from them weighed less than those of the control group. Chlorpyrifos inhibited moulting of *H. excavatum* nymphs. The percentage inhibition increases with concentration. The results obtained were analyzed and the lethal concentrations caused 50 and 99% inhibition in moulting were determined, LC_{50} was 0.0013% and LC_{99} was 0.0072%. Larvae of *R. evertsi* were sprayed with emulsion solution of chlorpyrifos at different range of concentrations below the LC_{50} level during attachment. The treatment caused detachment of partially engorged larvae which showed signs of toxicosis. The feeding period of those remained on host was prolonged. The weight of engorged nymphs developing from treated groups and weight of adults emerged from them was less than that of the control group. The moulting period of nymphs succeeded to engorge was prolonged. Engorged females of *H. excavatum* and *R. sanguineus* were divided into group of 10 each. *H. excavatum* ticks were treated topically with chlorpyrifos and those of *R. sanguineus* dipped for 30 sc in emulsion solution of the chemical, at different range of concentrations. Chlorpyrifos at the level of concentration used affected the reproduction of both tick species, the efficacy increased with increasing concentrations. The chemical prevented the oviposition of treated females at high concentrations used. The estimate reproduction (ER) factor was determined for each group and the results were expressed as percentage inhibition in oviposition. The probit LC_{50} was 0.0192% for *H. excavatum* and 0.0046% for *R. sanguineus.*