



**UNIVERSITY OF NAIROBI  
COLLEGE OF AGRICULTURE AND VETERINARY SCIENCES  
FACULTY OF VETERINARY MEDICINE  
DEPARTMENT OF VETERINARY ANATOMY AND PHYSIOLOGY**

**ANNUAL REPORT 2013/4**

**Foreword**

The Department of Veterinary Anatomy and Physiology is a Department of The Faculty of Veterinary Medicine (FVM), College of Agriculture and Veterinary Science (CAVS) located at Chiromo Campus. The Department teaches preclinical Veterinary Students Animal Physiology and Veterinary Anatomy. It also offers courses to BSc wildlife BSc Fisheries and BSc Leather students form a selection of the following courses; Vertebrate Anatomy, Ecophysiology, Ornithology, Ichthyology, Herpetology and Wildlife Behaviour. The Department also offers undergraduate service courses to the Faculty of Agriculture and College of Health Sciences (BSc. Biochemistry). Postgraduate service courses are also offered to the Department of Animal Production and The School of Biological Sciences ( MSc. Biology of Conservation).

**PROGRAMMES OFFERED**

**Postgraduate Programmes - 5**

- 1) PhD (Animal Physiology)
- 2) PhD (Veterinary Anatomy)
- 3) Master of Science in Comparative Animal Physiology
- 4) Master of Science in Reproductive Biology
- 5) Master of Science in Veterinary Anatomy and Cell Biology

**Undergraduate Programmes - 4**

- 1) Bachelor of Veterinary Medicine
- 2) Bachelor of Science in Wildlife Management and Related Options
- 3) Bachelor of Science in Fisheries
- 4) Bachelor of Science in leather

**ENROLLED STUDENTS IN POSTGRADUATE PROGRAMMES**

PhD.	-	7
Masters	-	3

### **NO. OF STAFF AND THEIR DESIGNATION**

Professor	-	2
Assoc. Professor	-	4
Senior Lecturer	-	8
Lecturer	-	5
Tutorial Fellow	-	6
Chief Technologist	-	2
Senior Technologist	-	6
Technologist	-	8
Carpenter	-	1
Maceration	-	1
Cleaner	-	1
Messenger	-	<u>1</u>
<b>TOTAL</b>		<b>45</b>

### **NUMBER OF GRADUANDS**

Masters	-	2
PhD	-	1
Doctoral	-	1

### **TRAINING**

**1<sup>st</sup> to 4<sup>th</sup> April 2013.** As part of the mentoring for other Universities, The Department offered a Service Delivery Practical Training for BSc. Animal Health (JKUAT) students.



*Above: Practical training for BSc. Animal Health (JKUAT) students.*

Between August and November 2013, Dr. Boniface Kavoi from Dept. of Vet. Anatomy & Physiology was a visiting scholar at the University of Ghana, School of Veterinary Medicine and Consumer Sciences. While on the academic visit, he taught Veterinary Gross Anatomy to 200 BVM students at the School. He further

engaged in research by supervising post graduate students. He also engaged in Vet. Gross Anatomy curriculum development.



*Above: Dr. Boniface Kavoi academic visit at the University of Ghana, School of Veterinary Medicine and Consumer Sciences*

## **EXCHANGE PROGRAMMES**

### **RESPOND Faculty exchange programme.**

From May 28<sup>th</sup> to 21<sup>st</sup> June 2013: Prof. Seth M. Kisia visited the University of Minnesota, USA. for the “2013 Public Health Institute (Training)” at the School of Public Health, from May 28<sup>th</sup> to 21<sup>st</sup> June 2013. The visit was a RESPOND Faculty exchange programme sponsored by USAID involving Scientists from Central and East Africa (Kenya, Uganda, Tanzania, Ethiopia, Rwanda and Democratic Republic of Congo) and S. E. Asia (Thailand, Malaysia, Indonesia and Vietnam) under the ‘ONE HEALTH’ concept



*Above: Prof. Seth M. Kisia at the University of Minnesota, USA.*

## **COLLABORATIONS**

### **Wildlife Molecular forensic Research Collaboration**

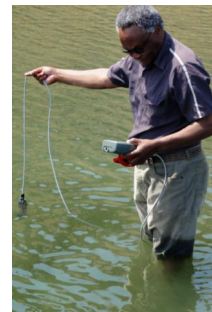
A collaborative research effort between the UoN (Department of Veterinary Anatomy and Physiology (Lead Departmental researcher, Dr. C.N. Kimwele)), JKUAT (Prof. Erastus Gatebe, Dr. Shadrack Muya, Professor Anne Muigai, Dr. Mercy Mwaniki) and Kenya Wildlife Services (Dr. F. Gakuya). In 2012 through to 2013 one Ph.D and three MSc. students carried out laboratory analysis at the Biotechnology laboratory of the Department. The three students were Julius Kinuthia (JKUAT), David Mbugua (UoN), Ednah Kwamboka (JKUAT) and Morris Mugambi (JKUAT).



*Above left to right: Dr. C.N. Kimwele, Ms. Ednah Kwamboka (JKUAT), Mr. David Mbugua (UoN), and Mr. Morris Mugambi (JKUAT)*

### **Lake Magadi Collaborative Research**

Between July and August 2013 the Magadi Collaborative Research, including members of the Department and scientists from McMaster University Canada, Federal University Rio Grande, Brazil, University of Antwerp, Belgium South Eastern University, Kenya Wildlife Services and University of Nairobi visit For 2 Months. The Lake Magadi Collaborative Research Team comprises of Dr Rodi Ojoo (UoN), Prof. Chris Wood, Dr Ora Johannsson (McMaster University), Prof. Gudrun DeBoeck (University of Antwerp Belgium), Dr Mosiany Kisipan (UoN), Dr Kevin Brix (Federal University of Rio Grande Brazil), Dishon Muthee (UoN), Dr Michael Papa (UoN) & Prof. John Maina (University of Johannesburg, SA). The Team visited Lake Magadi to study the lake Magadi fish.



*Above: Magadi Collaborative Research Team*

## **GRADUATION**

Four of our teaching staffs were awarded various degrees:



*Above: Graduands - Professor Geoffrey M. Ole Maloiy (left); Dr. Albert Nyongesa (right)*

1. Prof. Professor Geoffrey M. Ole Maloiy was awarded a Doctor of Science degree
2. Dr. Albert Nyongesa graduated with a PhD in comparative physiology
3. Dr. Kimani Muturi graduated with an MSc in Vertebrate Anatomy
4. Dr. Nasimolo also graduated with an MSc in Vertebrate Anatomy

## **Community Outreach Activities**

CAVS - KIPPRA tree planting, 23<sup>rd</sup> June 2013.



*Above: Dr. Dominic Ochwang'i planting a tree (Right)*

## **STAFF WELFARE**



*Above: DVAP Welfare Annual general meeting was held on 28th November 2013.*

## **CONSULTANCIES**

1. Provided Veterinary Anatomy practicals to students of Jomo Kenyatta University of Agriculture and Technology (JKUAT).
2. Offered service learning to the following groups of students:
  - a) BSc. Animal health production and processing, Dept. Land resources, JKUAT.
  - b) Dip. Meat technology, Meat Training institute, Athi River
  - c) Dip. Animal health and production, Ahiti Ndobu.

## **RESEARCH**

Research areas undertaken

- Physiological and Ecological studies of the unique aquatic life in Lake Magadi, Kenya.
- Conservation genetics and forensics in Kenya
- Evaluation of traditional herbal therapy for cancer state
- Mechanism of action of purified cathinone from khat (*Catha edulis*) on behavioural and reproductive function in vervet monkeys (*Chlorocebus aethiops*)".
- Investigations on Notch signaling in developmental angiogenesis.
- Mechanisms of blood-gas barrier development in an avian model.
- Spermatogenesis spermatogenesis in Lake Magadi tilapia (*Alcolapia grahmi*): A fish living on the edge
- Evaluation of pain alleviating, anti-inflammatory and anti-Rheumatoid properties of selected Kenya Medicinal plants.
- Pharmacological, Toxicological and Phytochemical study of *Clerodendrum myricoides*, an important medicinal plant used in Samburu, Kenya.
- Development of a biopesticide for use against mosquitoes from selected plants in Msambweni District, Kenya.
- Indigenous knowledge and practices of the Ameru in natural resources conservation
- Animal welfare Research and Policy in Africa

## **Grants**

- Preparation of a grant proposal for ERAfrica

## **INTERNATIONAL LINKS AND COLLABORATIONS**

1. McMaster University, Canada
2. University of Johannesburg, South Africa
3. Great Lakes Laboratory for Fisheries and Aquatic Sciences, Canada
4. University of Antwerp, Belgium
5. Universidade Federal do Rio Grande (FURG), Brazil
6. University of Wyoming, U.S.A
7. JKUAT
8. Kenya Wildlife Services (KWS)
9. University of Minnesota through its Duluth Campus Medical School
10. Institute of Anatomy, University of Bern. This link supports joint research projects and capacity building for the Department of Veterinary Anatomy and Physiology and the Institute of Anatomy, University of Bern.
11. With Dr. Ivanka Dimova, Department of Medical Genetics, Medical University Sofia, Bulgaria
12. Tufts University and University of Minnesota on One Health.
13. World Society for the Protection of Animals

## **PUBLICATIONS**

- 1 Michael B. Papah, Seth M. Kisia, Rodi O. Ojoo Andrew N. Makanya, Chris M. Wood, Geraldine D. Kavembe, John Maina, Ora E. Johannsson, Harold L. Bergman, Pierre Laurent, Claudine Chevalier, Adalto Bianchini, Lucas F. Bianchini, and Daniel W. Onyango (2013). Morphological evaluation of spermatogenesis in Lake Magadi tilapia (*Alcolapia grahami*): a fish living on the edge. *Tissue and Cell* 45: 371–382
- 2 Chris M. Wood, Michele Nawata, Jonathan M. Wilson, Pierre Laurent, Claudine Chevalier, Harold L. Bergman, Adalto Bianchini, John N. Maina, Ora E. Johannsson, Lucas F. Bianchini, Geraldine D. Kavembe, Michael B. Papah, and Rodi O. Ojoo (2013). Rh Proteins and NH<sub>4</sub><sup>+</sup> –activated Na<sup>+</sup>-ATPase in the Magadi Tilapia (*Alcolapia grahami*), a 100% Ureotelic Teleost Fish. *Journal of Experimental Biology* 216:2998–3007
- 3 Nyongesa, A.W., Oduma, J.A., Nakajima, M., Odongo, H.O., Adoyo, P.A and al'Absi, M (2013). Acute and sub-chronic effects of purified cathinone from khat (*Catha edulis*) on behavioural profiles in vervet monkeys  
(*Chlorocebus aethiops*). *Metabolic Brain Disease* Vol 28: 3. DOI 10.1007/s11011-013-9441-z.
4. Nyongesa, A.W., Oduma, J.A., Nakajima, M., Odongo, H.O., Adoyo, P.A and al'Absi, M (2013). Dose-response inhibitory effects of purified cathinone from khat (*Catha edulis*) on cortisol and

- prolactin release in vervet monkeys (*Chlorocebus aethiops*). *Metabolic Brain Disease* Vol 28 Number 4. DOI 10.1007/s11011-013-9445-8.
5. Makanya AN, Anagnostopoulou A, Djonov V 2013 Development and Remodeling of the Vertebrate Blood-Gas Barrier. *Biomed Research International*. Article ID 101597
  6. Dimova I, Hlushchuk r, Makanya A, Styp-Rekowska B, Ceausu, A, Fluckiger S, Lang S, Semela D, Le Noble F, Chartterjee, S, Djonov V. (2013) Inhibition of Notch signaling induces extensive intussusceptive neoangiogenesis by recruitment of monuclear cells. *Angiogenesis* 16: 921–937.
  7. Lucia K Keter, Nicholas M Mwikwabe, Mathiu P Mbaabu, Harihara M Sudheer, Festus M Tolo, Palu Dhanani and Jennifer A Orwa (2013). Validation of Safety and Efficacy of Antitussive Herbal Formulations. *African Journal of Pharmacology and Therapeutics*, Vol 2 No (1) Page 26 – 31.
  8. Dominic Ochwang'i , Charles Kimwele , Stephen G. Kiama , and Nancy Rice (2013) Transcriptional regulation of Rat Endothelial Nitric Oxide Promoter in Pulmonary Myofibroblasts cells and its implications in Pulmonary Fibrosis. *African Journal of Pharmacology and Therapeutics* Vol. 2 No. 1 Pages 1-8
  9. M.M. Mururu, A.W.T Muigai, C. Kimwele, E Gatebe, J. Kinuthia, M. Mwaniki, F Gakuya, E Kwamboka and D. Mbugua (2013). Cytochrome oxidase 1 gene and its application in wildlife forensics in Kenya (2013). *FIRE Journal of Science and Technology*, 3 (2013) 108-119
  10. D. Mbugua, C.N. Kimwele, J.O. Jung'a, E. Gatebe, F. Gakuya., M.J. Kinuthia, M.M. Mugambi, E.S. Kwamboka (2014) Use of cytochrome oxidase 1 gene region: a molecular tool for the domestic and wildlife industry in Kenya. *Scientific Journal of Animal Science* (2014) 3(3) 87-94.
  11. Catherine Kaluwa Kaingu Jerriimah Achieng Oduma, James Mucunu Mbaria, Stephen Gitahi Kiarna. Medicinal plants traditionally used for the management of female reproductive health dysfunction in Tana River County, Kenya. *International Journal of Genuine Traditional Medicine*. 3 (2): e17
  12. Kaingu C.K., Oduma J.A., Mbaria J.M., Kiama S.G. (2013) Ethnobotanical Survey of Medicinal Plants Used For the Management of Male Sexual Dysfunction and Infertility in Tana River County, Kenya. *The Journal of Ethnobiology and Traditional Medicine*. Photon 119, 453-463.
  13. Albert W. Nyongesa • Jemimah A. Oduma • Motohiro Nakajima, Hesbon O. Odongo • Pius A. Adoyo • Mustafa al' Absi (2013). Acute and sub-chronic effects of purified cathinone from khat (*Catha edulis*) on behavioural profiles in vervet monkeys (*Chlorocebus aethiops*). *Metab Brain Dis* DOI:10.1007/s11011-013-9441-z
  14. Albert W. yongesa • Jemimah A. Oduma • Motohiro Nakajima. Hesbon O. Odongo • Pius A. Adoyo • Mustafa ai' Absi (2013). Dose-response inhibitory effects of purified cathinone from khat (*Catha edulis*) on cortisol and prolactin release in vervet monkeys (*Chlorocebus aethiops*). *Metab Brain Dis* DOI 10.1007/s11011-013-9445-8
  15. Catherine Kaluwa Kaingu, James Mbaria, Jerriimah Achieng Odurna, Stephen Gitahi Kiarna (2014) Ethnobotanical study of medicinal plants traditionally used in Tana River County for management of illnesses. *Asian Journal of Complementary and Alternative Medicine* 02 (02); 01-05.
  16. Dominic O. Ochwang'i, Charles N. Kimwele, Jemirnah A. Oduma, Peter K. Gathumbi, James M. Mbaria, Stephen G. Kiarna (2014). Medicinal plants used in treatment and management of cancer in Kakamega County, Kenya. *Journal of Ethnopharmacology* 151: 1040-1055



17. Johnson Nasimolo • Stephen Gitahi Kiama • Peter Karuri Gathumbi • Andrew degwa Makanya • John Maina Kagira (2014) *Erythrina abyssinica* prevents meningoencephalitis in chronic *Trypanosoma brucei brucei* mouse model. *Metab Brain Dis* 001 10.1007.'5 II 0 11-0 14-9488-5
18. Boniface M. Kavoi, Johanna Plendl, Andrew N. Makanya, Shem Ochieng', Stephen C. Kiama (2014) Effects of anticancer drug docetaxel on the structure and function of the rabbit olfactory mucosa. *Tissue and Cell*
19. A. N. Makanya/2 B. M. Kavoi,l and V. Djonov' (2014). Three- Dimensional Structure and Disposition of the Air Conducting and Gas Exchange Conduits of the Avian Lung: The Domestic Duck (*Cairina moschata*). *Anatomy Volume 2014*. Article ID 621982. 9 pages

## **CONFERENCES AND WORKSHOPS**

### **PAPERS PRESENTED AT CONFERENCES and workshops**

1. Michael B. Papah, Chris M. Wood, Geraldine D. Kavembe, John Maina, Ora E. Johannsson, Gudrun De Boeck, Adalto Bianchini, Kevin Brix, Kisipan M. Letura, Harold L. Bergman, Lucas F. Bianchini, and Rodi O. Ojoo: Spermiogenesis and sperm ultrastructure in Lake Magadi Tilapia, and their possible phylogenetic significance. Kenya's Soda Lakes Workshop, Kenya Wildlife Training Institute, Naivasha, Kenya 4th to 7th Dec 2013.
2. Michael B. Papah, Seth M. Kisia, Rodi O. Ojoo, Chris M. Wood, Geraldine D., Kavembe, John Maina, Ora E. Johannsson, Gudrun De Boeck, Adalto Bianchini, Kevin Brix, Kisipan M. Letura , Lucas F. Bianchini, and Daniel W. Onyango: Lake Magadi ecosystem: Current research trends and future perspectives. 1st International One Health Conference, Hilton Hotel, Addis Ababa Ethiopia, 23rd to 26th Sept 2013.
3. Nyongesa "Neural and hormonal interplay influencing behaviour following acute and sub-chronic cathinone administration in vervet monkeys (*Chlorocebus aethiops*)" presented at the 11th International Conference of the Society of Neuroscientists of Africa in Rabat, Morocco (June 13-17, 2013).
4. Nasimolo. presented his work on "*Erythrina abyssinica* ameliorates Neuroinflammation in African Trypanosomiasis mouse model" at the 11th International SONA Conference in Rabat Morocco, from 13th-18th June 2013.
5. Nasimolo. Presented his research entitled: "*Erythrina abyssinica* ameliorates Neuroinflammation in African Trypanosomiasis mouse model" at the 19th International Scientific Conference on Basic and Clinical Research for improved Health on 11th-13th 2013 in Southern Sun, Mayfair Nairobi, Kenya
6. Dr. Papah presented a research on "Lake Magadi ecosystem: current research trends and future perspectives" during the 1st OHCEA One Health Conference, in Hilton Hotel, Addis Ababa, Ethiopia from 22 - 26 September 2013. One Health conference , Ethiopia (Nasimolo, Papah, Kimani)
7. Dr. Nasimolo Johnson presented on "*Erythrina abyssinica* ameliorates Neuroinflammation and conserves proteins in African Trypanosomiasis mouse model" in the 1st OHCEA One Health Conference, in Hilton Hotel, Addis Ababa, Ethiopia from 22 - 26 September 2013.



*Left: Dr. Nasimolo presenting in the 1<sup>st</sup> OHCEA one Health conference in Addis Ababa, Ethiopia.  
Right: Dr. Kimani (2<sup>nd</sup> from left), Dr. Papah (1<sup>st</sup> from right) and Dr. Nasimolo (2<sup>nd</sup> from right) with other participants during the 1<sup>st</sup> OHCEA One Health conference.*

8. Mathiu. August 15th 2013. Presented the Tharaka Nithi County Strategic Plan to the County leaders at Chuka University.

### **SEMINARS, WORKSHOPS AND CONFERENCES ATTENDANCE**

1. Nasimolo. **ICGEB** Biodownstream Technology Course in Piran, Slovenia from 15<sup>th</sup>-19<sup>th</sup> April, 2013.
2. Papah. the 19<sup>th</sup> International Scientific Conference on Basic and Clinical Research for improved Health on 11<sup>th</sup>-13<sup>th</sup> September 2013 in Southern Sun, Mayfair Nairobi, Kenya.
3. Kimani. The 19<sup>th</sup> International Scientific Conference on Basic and Clinical Research for improved Health on 11<sup>th</sup>-13<sup>th</sup> September 2013 in Southern Sun, Mayfair Nairobi, Kenya.
4. Papah. The Soda Lakes Kenya: Their current conservation status and management. A workshop held at the Kenya Wildlife Training Institute Naivasha Kenya, 4<sup>th</sup> to 7<sup>th</sup> Dec. 2013.
5. Papah. 1<sup>st</sup> International One Health Conference on: One Health and Control of Infectious Diseases: Building Capacity Systems and Engaging Community, held at the Hilton Hotel, Addis Ababa, Ethiopia, 23<sup>rd</sup> - 26<sup>th</sup> Sept 2013. Presented a paper on Lake Magadi Ecosystem: Current Research Trends and Future Perspectives.
6. Papah. 2<sup>nd</sup> infectious diseases symposium, Social Services League, M.P. Shah Hospital, Nairobi 10<sup>th</sup> August, 2013.
7. Papah. Prevention of alcohol and drug abuse, gender and disability workshop held at College of Agriculture and Veterinary Sciences, University of Nairobi 27<sup>th</sup> May 2013.
8. Kaluwa. The 19<sup>th</sup> International Scientific Conference on Basic and Clinical Research for improved Health on 11<sup>th</sup>-13<sup>th</sup> 2013 in Southern Sun, Mayfair Nairobi, Kenya.
9. Nasimolo. AAS/TWAS-ROSSA Workshop on Cell Biology and Regenerative Medicine, 11<sup>th</sup>- 13<sup>th</sup> November 2013, Nairobi Kenya
10. Kimani. The 1<sup>st</sup> OHCEA One Health Conference, in Hilton Hotel, Addis Ababa, Ethiopia from 22 - 26 September 2013.
11. Kaluwa. The 15<sup>th</sup> Symposium of the Natural Products Chemistry Research Network for Eastern and Central Africa (NAPRECA) from 3<sup>rd</sup> -10<sup>th</sup> December, 2013 in Khartom Sudan.
12. Ochwang'i. The 15<sup>th</sup> Symposium of the Natural Products Chemistry Research Network for Eastern and Central Africa (NAPRECA) from 3<sup>rd</sup> -10<sup>th</sup> December, 2013 in Khartom Sudan.