RISE AFNNET WORKSHOP:

Nairobi Node

Venue: KCB Karen 26th and 27th October 2012

ORGANIZED BY PROF KIAMA GITAHI,

NODE LEADER, RISE AFNNET

RISE Regional Initiative in Science and Education

Participants

PhD Students		MSc Students	
1.	Dr Irene Kamanja	6.	Karambu Muriithi
2.	Dr Stanley Wambugu	7.	Dr Johnson Nasimolo
3.	Dr Catherine K Kaingu	8.	Clare Njoki
4.	Dr Dominic Ochwang'i	9.	Dr James Kuria
5.	Mr Joseph Musau	10.	Dr Zachary Rukenya
		11.	Dr Ronald Okindo

PostDocs			
12.	Dr Daniel Gakuya	13.	Dr Joseph Nguta

The Faculty			
14.	Prof. Peter Gathumbi	16.	Dr Mbaambu Mathiu
15.	Prof James Mbaria	17.	Dr Jemimah Oduma

Secretariat

18. Prof Kiama Gitahi, Node Leader and Faculty member
19. Jackson Mugweru, Technical Support
20. Janet Ndoro, Recording

RISE AFNNET WORKSHOP: Nairobi Node
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Friday October 26, 2012		
TIME	**Title of Presentation**	**Presenter/Responsible Person(s)**
5:00 – 6.00 PM	Arrival and registration of participants	Janet Ndoro and Jackson Mugweru
	Recording the Proceeedings	Janet Ndoro
6.30-7.30	General Overview of RISE AFNNET, Way forward and the Workshop Program	Prof Kiama Gitahi
Saturday October 27, 2012		
	Chairman of Session	**Prof Peter Gathumbi**
8.20 – 8.40	Effect of feeding Moringa oleifera leaf meal on intake, growth, nutrient digestibilty and carcass in broiler chicken	Dr Daniel Gakuya
8.40 – 9.00am	Antimalarial activity of some plants traditionally used in treatment of malaria in Msambweni district of Kenya	Dr Joseph Nguta
9.00 – 9.20 am	Pharmacological and toxicological study of ethnomedical herbal remedy used for management of sexually transmitted diseases in Samburu, Kenya.	Dr Irene Kamanja
9.20-9.40	Antinociceptive Properties of Selected Medicinal Plants used in the Treatment of Chronic Joint Pains in Machakos County, Kenya	Dr Stanley Wambugu
9.40-10.00	**GENERAL DISCUSSION**	
10:00 - 10:40am	**TEA BREAK**	
	Chairman of Session	**Dr Mbaambu Mathiu**
10.40-11.00 am	Ethno-Botanical Uses and Phytochemical Analysis of *Cyperus articulatus* from Tharaka Meru	Karambu Muriithi
11.00 – 11.20 am	*Erythrina abyssinica* ameliorates meningoencephalitis and conserves proteins in *Trypanosoma brucei brucei* chronic mice model	Dr Johnson Nasimolo
11.20-11.40 am	Hypoglycemic Activity of *Zanthoxylum Chalybeum* in Diabetic Rats	Clare Njoki
11.40-12.00	**GENERAL DISCUSSION**	
	Chairman of Session	**Prof. James Mbaria**
12.00-12.20	Wound healing, safety and antimicrobial activity tests for *Aspilia pluriseta* schweinf. (Asteraceae).	Dr James Kuria
12.20-12.40	In vitro Antimicrobial & Cytotoxic Activity of *Aloe turkanensis*, an Ethnomedical Herbal Remedy Used in Turkana, Kenya	Dr Zachary Rukenya
12.40-13.00	To determine the efficacy, phytochemistry and evaluate the safety of a medicinal plant (*Vernonia hymenolepis*) used in Kenya for oral health.	Dr Ronald Okindo
13.00-13.20	**GENERAL DISCUSSION**	

13.20– 14.20 pm	**LUNCH BREAK**	
	Chairman of Session	**Dr Daniel Gakuya**
14.20 – 14.40 pm	Ethnotherapeutic management of female reproductive health dysfunction in Tana river county, Kenya.	Dr Catherine K Kaingu
14.40-15.00	Pharmacophysiological anti-cancer potential of medicinal plants used in Kakamega county, Kenya (an in-vitro study).	Dr Dominic Ochwang'i
15.00-15.20	Development of a biopesticide for use against mosquitoes from selected plants in Msambweni district, Kenya	Mr Joseph Musau
15.20-15.40	**GENERAL DISCUSSION**	
15.40-16.00	Student discussion with their supervisors	
16.00-16.30pm	Final Remarks and Way Forward	Prof. Kiama Gitahi
16.30 pm	**TEA AND DEPARTURE**	

EFFECT OF FEEDING MORINGA OLEIFERA LEAF MEAL ON INTAKE, GROWTH, NUTRIENT DIGESTIBILTY, PLASMA LIPIDS AND CARCASS IN BROILER CHICKEN.

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ABSTRACT
Aim of the study: The purpose of this study was investigate the effect of feeding *Moringa oleifera leaf* meal at different levels in broiler chicken with the aim of assessing it's potential in poultry production.

Materials and methods: *Moringa oleifera* leaves were obtained from Mtito- Andei in Kibwezi division in Makueni county and ground into powder before being included in various diets. Broiler starter and finisher diets were formulated using maize, wheat pollard, soya bean, omena, limestone, cattle salt, broiler premix, lysine and methionine all obtained from local feed manufacturers. MOLM was included in the diets at different levels as follows: TRT1(MOLM 0%), TRT2(MOLM7.5%), TRT3(MOLM 7.5%), TRT4(MOLM 15%), TRT5(MOLM 30%). TRT3 had MOLM of 7.5% but had no methionine and lysine. The broiler house was set and 20 cages were randomly allocated with the 4 replicates of 10 birds each for each treatment group. Experimental day old broiler chicks were procured and fed on commercial broiler initially before being sexed , put into appropriate cages and fed on experimental diets. They were weighed weekly and the amount of feed consumption determined. Routine vaccination was carried out.the data collected was entered in the MS Excel programme at the end of every week and feed intake, Feed conversion ratio(FCR) and weight gain calculated. The experiment was ended on day 36 and all replicates in the treatment groups weighed. Blood samples were collected for lipid profile analysis. Fourty broiler birds were sacrificed for gut morphology studies and weighing of abdominal fat pad. A further 40 birds (a male and female from each replicate) were selected for digestibility studies. Feed consumption was recorded, faecal samples collected and processed to determine the nutrient . All data was analysed using Genstat for windows 15th edition.

Results : The difference in the weight of the birds was significantly difference between the various diets ($p<0.05$). Diet TRT1 produced birds with significant highest weight (1512g) than the rest of the diets with the lowest weight in diet TRT5(962g). The weight gain was also significantly different between the various diets with the highest weight gain being in TRT1 at 1464 and the lowest in diet TRT5. The feed intake of diets (TRT4 and TRT5) were significant different with the rest of the groups (T1,T2 and T3) which had no significant difference. The difference in dry matter digestibility of the diets TRT1,TRT2, TRT3 and TRT4 was not significant($p<0.05$) but diet TRT5 had significantly lower dry matter digestibility which was significantly different from diets TRT1, TRT2 and TRT3 but not diet TRT4.The abdominal fat pad(AFP) of the birds expressed as percentage of body weight was significantly higher in diet TRT1 compared to TRT2,TRT4 and TRT5 but it had no difference with TRT3. On the effect of sex on the levels of HDL, the males had a significantly high level than females in TRT2, TRT3 and TRT4 (($p<0.05$). The males had significant high levels of TC than females in all diets except TRT5.The colour of the carcass was more yellowish with the increase of the levels of MOLM

Conclusion:
Moringa oleifera leaf meal(MOLM) can only be included in the feed to levels of up to 7.5% as higher levels affected weight gain, feed intake. The yellowing of the carcass with MOLM inclusion would also be used by

poultry producers due to the appealing color by consumers. There is need to investigate the influence of the yellow colour on eggs and study the antibiotic and coccidiostatic activity of MOLM.

Antimalarial activity of some plants traditionally used in treatment of malaria in Msambweni district of Kenya

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Abstract

Introduction: Malaria continues to kill over a million people each year, with more than 90% of these cases found in sub-Saharan Africa. In many populations affected by malaria, conventional drugs are often unaffordable or inaccessible, and increasing drug resistance by the malaria parasite, *P. falciparum*, is of significant concern.

Objectives: The current study was designed to evaluate the antimalarial activity and in *vivo* toxicity of selected plants from Msambweni district, Coast province, Kenya.

Materials and Methods: Aqueous and organic [Chloroform: Methanol (1:1)] extracts from each plant were prepared and used to determine *in vivo* anti-malarial activity and *in vivo* toxicity. They were also screened for their phytochemical constituents.

Results: The screened plants exhibited varying degrees of chemosuppression. Aqueous extracts of *Adansonia digitata* L. (leaves), *Securidaca longenpendunculata (roots), Flacourtia indica (leaves), Ocimum gratissimum (leaves) and Hoslundia opposita (roots)* had 60.47%, 96.4%; 90.3%; 91.98% and 96.3% parasite growth inhibition respectively. Chloroquine (positive control) had 87.23% parasite growth inhibition. All the plant extracts had LD_{50} values greater than 2000 mg/kg. Phytochemical screening of the crude extracts showed that alkaloids, flavonoids, sesquiterpene lactones and saponins were present in all plant species.

Conclusions: The above plant species were shown to possess promising antimalarial activity and were non-toxic to mice. These results indicate that there is potential for isolation of new scaffolds against *Plasmodium falciparum* from the aqueous extracts of the five plant species.

Pharmacological and toxicological study of ethnomedical herbal remedy used for management of sexually transmitted diseases in Samburu, Kenya.

Kamanja I.T.[1*], Mbaria, J.M.[1], Gathumbi, P.K. [2], Mbaabu, M.[3], Lanyasunya, A.[4] Gakuya, D.W. [5] Kabasa, John D. [6] and Kiama, S.G. [3]

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ABSTRACT

Introduction: Globally, the prevalence rate of Sexually Transmitted Infections is 8.5%. There is drug resistance and especially penicillin resistant gonococci making some STIS harder to treat. Lack of resource for health care and treatment has interfered with control of STIS and poor Infrastructure, Poverty, Illiteracy, cultural practices viz; polygamy, beading practice and forced marriages, has made the Samburu community to rely heavily on herbal medicine.

Aim of the study

The study aimed at documenting the use of traditional medicine in management of sexually transmitted infections by Samburu traditional healers. The study also aims at carrying out cytotoxicity studies, phytochemical studies, sensitivity studies, acute and sub acute toxicity studies on some selected medicinal plants in Samburu County.

Materials and Methods

Data on use of plants for management of STIs was obtained using focused group discussions and administration of semi-structured questionnaire to 29 traditional healers from seven divisions in Samburu County. Brine Shrimp Lethality Test (BLT) was used to assess the cytotoxicity of the herbal remedies. Preliminary phytochemistry was done to get phytochemicals present in some selected medicinal plants, the bacterial sensitivity tests were carried out using broth dilution method on the same plants while toxicity tests were carried out using laboratory animals on aqueous extract of *Clerodendrum myricoides.*

Results and Discussion

The symptoms of STIs as mentioned by the traditional healers were varied and diverse and Samburu community has accumulated reliable ethno-diagnostic skills for diagnosis of STIs on the basis of these symptoms. The commonly used plants species in management of STIs as cited were *Clerodendrum myricoides, (93%) with the roots being the most preferred part, Carissa edulis (52%), Myrsine africana,(31%), Rhamnus staddo,(24%) Rhamnus prinoides 17%), Sansevieria enhribergii, (10%) and Psiadia arabica (10%). Clerodendrum myricoides* was ranked first in STIs management and is used alone or in combination with the other plants. The aqueous extract of *Clerodendrum* myricoides was not cytotoxic as LC50 > 1000, the phytochemicals present included triterpenes, saponins, tannins,phenols glycosides, cardioglycosides, and resins. The aqueous extract of *Clerodendrum myricoides* showed a broad spectrum activity against the various micro organisms used. The

toxicity tests revealed that this extract is slightly toxic with an LD50 of 1000 and the target organs were the liver, kidney spleen lung and heart muscle.

Conclusion
The survey showed that *Clerodendrum myricoides alone or in combination with* other plants is considered as important medicinal remedy for STIs in the Samburu community. The sensitivity tests revealed that the aqueous extract of *Clerodendrum myricoides* was active against most of the microorganisms used. This extract can be used as a non cytotoxic drug although the tocixity results classifys it as slightly toxic.

Antinociceptive Properties of Selected Medicinal Plants used in the Treatment of Chronic Joint Pains in Machakos County, Kenya

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Abstract
Background: Traditional medicines play an important role in the management of chronically painful and debilitating joint conditions, particularly in the rural Africa. However, their potential use as sources of medicines has not been fully exploited. This is partly because most remain undocumented and their efficacy has not been evaluated. The present study was therefore carried to find the medicinal plants traditionally used to manage chronic joint pains and to test their antinociceptive potential using the formalin test in rats.

***Materials and* Methods:** To obtain this ethnobotanical information, 30 consenting traditional herbal medical practitioners were interviewed exclusively on medicinal plant use in the management of chronic joint pains and rheumatoid arthritis, in a pre-planned workshop. the plant materials were pulverized and extracted in water (aqueous extract) and Diclormethane: Methanol (organic extract). To evaluate the antinociceptive potential of the most commonly cited plants, the formalin test was adopted. Wister rats were injected with 20 uL of 5% formalin intra-dermaly in the dorsal part of the hind paw and pain related behaviours scored for 60 minutes in blocks of 5 minutes. The extract was administered intraperitonealy, 30 minutes prior to the injection of formalin.

Results and Discussion: In the survey, a total of 37 plants belonging to 32 genera and 25 families were cited as being important. The most commonly cited plant species were *Pavetta crassipes* K. Schum, *Strychnos henningsii* Gilg., *Carissa spinarum* L., *Fagaropsis hildebrandtii* (Engl.) Milve- Redhi and *Zanthoxylum chalybeum* Engl., while the most representative plant families were Fabaceae, Asteraceae, Verbenaceae, Rutaceae and Solanaceae. *Acacia mellifera* Vahl., *Amaranthus albus* L., *Balanites glabra* Mildbr. & Schlecht., *Grewia fallax* K. Schum., *Lactuca capensis*, *Launaea cornuta* (Oliv. & Hiern) O. Jeffrey, *Lippia kituiensis* Vatke, *Pappea capensis* Cackl. and Zeyl. and *Pennisetum glaucum* (L.) R. Br. (Poaceae) are documented for the first time as being important in the management of chronic joint pains. The plant materials had varied yields depending on the plant part as well as the solvent system used. The extracts had different antinociceptive potencies, which was dose dependent. The organic root bark extract of F. *Hildebrandtii* showed the highest potency.

Conclusions: The findings of this study show that a variety of medicinal plants are used in the management of chronic joint pains and that the administration is mainly by oral route. The most commonly cited plants showed

significant antinociceptive activity. Further work is necessary to evaluate their efficacy of the refined extracts as well the safety and standardization of the remedies used in pain management in Machakos.

Ethno-Botanical Uses and Phytochemical Analysis of *Cyperus articulatus* From Tharaka Meru

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ABSTRACT

Tharaka district in Kenya is situated in the semi arid parts of the larger Meru region. By the time of this study there was not a single tarmac road in the whole district and medical services were not easily accessible. The nearest well equipped public hospital was Meru general hospital situated in Meru central district in Meru county. Traditional medicines practitioners (TMPs) were the most accessible and affordable for the poor people of Tharaka. They were mainly using *Cyperus articulatus* for treating various ailments. It was also used as a mouth freshener and as perfume. *C.articulatus* belongs to the family *cyperaceous* and the Species *Cyperus articulatus*. It's a popular plant among the Indians and geographically grows in almost all the wet regions of the world in swamps and along river banks. It's found along the Amazonian region and also along river Nile in Africa. In these *regions* it has been used for various treatment some of them similar to those mentioned by the traditional medicine practitioners in Tharaka. The main aim of this project was to establish the scientific basis of its popular performances. A one day workshop was conducted in Tharaka by 30 people. Semi-structured Questionnaires were administered to traditional herbal medicine practitioners (TMPs). Data was sought regarding *C.articulatus* and analyzed using descriptive statistics and the plant collected for taxonomic identification. Column chromatography (CC), PTLC plates (20 by 20 cm) Analytical TLC 254 or 366nm, followed by spraying with 1% vanillin in H_2SO_4 spray reagent were used for compound purification.. EI-MS spectra were recorded on Agilent GC-MS mass spectrometer. Constituents of the oil were identified by comparing the experimental gas chromatogram, retention indices and MS spectra of the compounds with the corresponding reference data. The 100% dichloromethane crude extract was tested against *Salmonella typhi*, *Streptococcus pneumoniae*, and *Staphylococcus aureus*. The extract was tested against laboratory reared *Aedes egyptii* mosquitoes. It was clear that TMPs understood all the uses of *C. articulatus* and were using it for treatment of various diseases. From this essential oil fifty nine compounds were detected. Terpenes accounted for the highest number of compounds with forty eight (81.36 %), twenty seven sesquiterpenes (45.76%), twenty monoterpenes (33.90%) one triterpene (1.69%) and eleven other (18.64%). The most abundant terpene was sesquiterpene α-cubenene. Both the crude extracts and all the fractions from *C.articulatus* were sweet smelling. This was attributed to the high number of terpenes in the essential oils. The crude extract was active against the three bacterial strains tested. It showed 100% repellent against mosquito *Aedes egyptii*. The essential oil from Tharaka was similar to essential oils from other parts of the world in that it contained some of the compounds that were seen in essential oils of *C. articulatus* from other parts of the world. It was also unique in that it had α cubenene as its major compound which was not the case with other oils encountered elsewhere. The Kenyan essential oil had the highest number of compounds which could be because of the method of extraction used (solvent extraction). Farmers should be encouraged to plant more *Cyperus articulatus* as its oil composition is similar to that of France and other countries that are using it for cosmetics And perfumery industry. We here recommend that formulation as a perfume, deodorant, air freshener, mouth-freshener and a mosquito repellent are done on this plant. It should also be examined for anti- allergic effects because its sweet smell does not seem to affect people who are

allergic to other commercial perfumes. The research should also be extended to the other *Cyperus* species found in the area of study like *Cyperus rotundus* which from S. Africa is reported to have related compounds.

ERYTHRINA ABYSSINICA AMELIORATES MENINGOENCEPHALITIS AND CONSERVES PROTEINS IN *TRYPANOSOMA BRUCEI BRUCEI* CHRONIC MICE MODEL

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Introduction: The neurological form of trypanosomiasis is characterized by neuroinflammation and 10% of patients treated with the recommended drug develop PTRE (Post treatment reactive encephalopathy) which is fatal. We used the chronic mice model of the disease to evaluate potential anti-inflammatory properties of *Erythrina abyssinica,* which was selected based on its wide medicinal use by different communities both in Kenya and other parts of world.

Methods: Water and methanol extraction was done followed by phytochemical screening. The extracts' LD50 was also determined. For the experiment, mice were divided into ten treatment groups two of which were positive and negative controls. Four groups received water extract of *erythrina abyssinica* and the other four groups received methanol extract of the same. Mice were infected intraperitonealy with $1x10^4$ trypanosomes, and 20mg/kg of diminazine aceturate given twenty one days post infection to induce neuroinflammation. Parasite counts were monitored from the third day post infection up to the end of the study at the twenty eight days post infection when animals were sacrificed. We then used histology, immunohistochemistry, scanning and transmission electron microscopy to study the pathogenesis and evaluate the degree of neuroinflammation. SDS-PAGE electrophoresis was performed to compare protein profiles.
Data was analyzed by one way ANOVA for the means and Tukey method used to compare the means.

Results: Mice treated with *erythrina abyssinica* water extracts demonstrated a statistical significant difference ($P< 0.05$) compared to the control. Astrocytosis was also greatly reduced in *erythrina* treated mice. Electron micrographs showed halos around trypanosomes which indicated possible extracellular matrix degradation. This was supported by protein analysis that demonstrated degradation of a high molecular weight protein in control group, but was conserved in *erythrina* treated mice.

Conclussion: This study provides evidense of anti-inflammatory and protein conserving properties of *Erythrina abyssinica,* validating its wide use as a medicinal plant. Further studies are needed to ascertain whether these effects are due to a single molecule or a result of synergistic effect of the various molecules present in the plant.

Hypoglycemic Activity of *Zanthoxylum Chalybeum* in Diabetic Rats

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Abstract

Background: *Zanthoxylum chalybeum* Engl. (Rutaceae) is used commonly in communities within Africa and Asia to manage diabetes mellitus. However, the hypoglycaemic activity of the plant has not been validated experimentally in the in vivo or in vitro diabetic models. This study investigated the hypoglycemic and anti-hyperglycemic effect of *Z. chalybeum* aqueous stem bark extract in streptozotocin (STZ)-induced diabetic rat models.

Materials and Methods: Streptozotocin (45 mg/kg body weight, IP, single injection)-induced diabetic rats were given 10,100 and 1000mg/kg body weight of the aqueous extract of *Z. chalybeum* orally for 14 days. The effect of the extract on blood glucose, body weight, food and water intake and oral glucose tolerance test was subsequently evaluated. Results were compared with diabetic glibenclamide-treated, normal controls and untreated diabetic controls.

Results: There was no significant difference between the diabetic groups in mean fasting glucose concentrations ($p<0.05$). All diabetic animals showed impaired glucose tolerance. The *Z. chalybeum* extract did not significantly reduce blood glucose levels 120min after glucose load $p<0.05$. There was a decrease in weight in all diabetic animals. This decrease was greatest in the glibenclamide treated group (37.79%), followed by the untreated diabetic group (36.44%). Extract treated diabetic animals experienced a comparatively decreased weight loss which was dose dependent at 18.22%, 23.15% and 32.78% for 1000mg/kg, 100mg/kg and 10mg/kg treated animals respectively. Food and water intake were significantly increased ($p<0.05$) in all diabetic animals. Administration of the extract did not reduce these levels back to baseline or normal control levels. Similarly, urine output remained elevated in the diabetic rats compared to the controls 14 days post treatment.

Conclusions: *Z. chalybeum* demonstrated hypoglycemic activity in a dose-dependent manner. However, this decrease was not statistically significant $p<0.05$. More research is required to determine efficacy at different dosages and the possible biological activity of *Z. chalybeum* for the treatment of diabetes mellitus.

WOUND HEALING, SAFETY AND ANTIMICROBIAL ACTIVITY TESTS FOR *ASPILIA PLURISETA* SCHWEINF. (ASTERACEAE).

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- *Corresponding Author.*

Abstract

Background of the Study

Wound healing abnormalities are among the greatest causes of deformity and disability, impose a physical and mental burden as well as an economic burden on patients and healthcare professionals and act as substrate for infection in injury patients and therefore prolong their recovery. Wound infection is one of the most common diseases in developing countries. The use of *Aspilia pluriseta* locally and regionally points to possible wound healing and anti-infective properties as well as its safety. This study aimed at validating this ethnomedical use and give due recommendations.

Materials and methods

The excision wound model in mice was used to evaluate the wound healing potential, broth macrodilution for antimicrobial activity assay and the Buehler Non-adjuvant test for allergy induction in guinea pigs. A plant powder ointment was used for the wound healing and the allergy tests while a methanol extract was used for the antimicrobial activity assay.32

Results

The results showed some wound healing enhancement, with ointment from the test plant comparing favorably with the standard drug in terms of epithelialization time and wound contraction. There was marginal, nonspecific antimicrobial activity against the bacteria and fungus tested. The test plant ointment induced moderate sensitivity in guinea pigs.

Conclusions

From these results, there has been shown possible merit in the use of this plant ethnomedically. Leads from ethnopharmacology remain a viable resource for the modern day bioprospector. The demonstrated wound healing activity offers justification for more in-depth studies into the plant's potential. The demonstrated sensitization potential is worth noting especially when the plant is employed in ethnomedicine.

In vitro Antimicrobial & Cytotoxic Activity of *Aloe turkanensis*, an Ethnomedical Herbal Remedy Used in Turkana, Kenya

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Abstract

Background of the study: Aloe turkanensis is a shrub with stems of up to 70cm long. It grows in loose clumps up to 2m diameter. Leaves are borne in a compact rosette, are erect to spreading with elongated whitish spots on both surfaces. In Kenya, the plant is mainly found in Baringo, Isiolo, Laikipia, Turkana and West Pokot districts and is recognized as an important ethnomedical remedy. The concurrent study was conducted in Turkana County. Turkana County is located in the northwestern part of Kenya (Rift Valley province) and constitutes 3 constituencies (Turkana North, Turkana central and Turkana South). Turkana covers a surface area of 68,680km^2, ranked as the 2nd largest county in Kenya. It has a population density of 13people per km^2 and total population of 855,399persons. The urban population is distributed in four major towns Lodwar (48,316), Kakuma (36,875), Lokichogio (17,695) and Lokichar. In this region, there is abundant species of Aloe turkanensis which occurs naturally on the hilly rocks.

Materials & method: Data was collected through observation, photographing, interviews & sampling. Whole plant was harvested from Natira community aloe garden in Natira sublocation, Kolobeiyei location in Turkana west district, Kenya on 10th February 2012. The garden occupies $^1/_8$ acreage in Natira sublocation, 42kms from Kakuma town along Lodwar-Lokichogio road. The garden is attended by local people most of whom are women. The plant collection was aided 5 employees from Government of Kenya-Lutheran World Federation humanitarian organization who provided the means of transport and security in the field, and 10 people from the local community who voluntarily provided information on medicinal plants. Cold percolation using 70% methanol and distilled water was used for extraction. Antimicrobial activity was tested using the Broth Dilution assay. The extracts were tested against in vitro standard cultures of Bacillus cereus (ATCC 11778), Staphylococcus aureus (ATCC25923), Pseudomonas aeroginosa (ATCC 27853), Escherichia coli (ATCC 25922) and a human infections clinical isolate of Candida albicans.

Results: The Turkana community uses the plant products to manage various ailments. Among them are; malaria, wounds, stomach ache, constipation, pain, skin infection, poultry diseases and retained afterbirth in cows. On laboratory testing the extracts inhibited the growth B. cereus (100-200mg/ml), S. aureus (<3.125-100mg/ml), and P. aeroginosa (200mg/ml) while Escherichia coli and Candida albicans were not affected. Brine shrimp lethality test was used to evaluate the toxicity of the plant extracts and found to be relatively non-toxic to Artemia latina.

Conclusion: Based on interviews conducted in the field and the subsequent in vitro laboratory testing of the sampled plant, it was concluded that the plant has metabolites that inhibit the growth of some bacterial organisms and is a relatively safe herbal remedy when used for human consumption. It is probably due to the antibacterial activity and safety of Aloe turkanensis that Natira community Aloe-working group herbalists use the plant products for treatment of wounds, eye infections (Bosch, 2006), skin infections, stomach upsets, livestock diseases and as cosmetics. However, there is need for further studies to validate the in vivo biological activity (antibacterial, toxicity, antimalarial and analgesic activities) of Aloe turkanensis as well as come up with proper and applicable methods for value chain addition of its products.

TO DETERMINE THE EFFICACY, PHYTOCHEMISTRY AND EVALUATE THE SAFETY OF A MEDICINAL PLANT (*Vernonia hymenolepis*) USED IN KENYA FOR ORAL HEALTH.

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ABSTRACT

Background information

Ethno medicine is a field of study that covers healthcare systems that include beliefs and practices relating to diseases and health, which are products of indigenous cultural development and are not explicitly derived from a conceptual framework of modern medicine. *Vernonia hymenolepis* is a species of a genus *Vernonia* that has widely been used as traditional herb by Herbalist and communities in Kitale in treatment of various infections including oral conditions. However its efficacy and toxicity have not been established. In this study antimicrobial,analgesic properties,phytochemistry and toxicity of ***Vernonia hymenolepis*** leaves will be ascertained.

Material and Methods

Plant Collection and Extraction

Leaves of *Vernonia hymenolepis* were collected from Trans nzoia county,Kenya. Plants were collected and identified of the plants was verified at the University of Nairobi Herbarium in botany department and voucher specimens deposited (Voucher number 24097009). The plant sample was shade dried and milled into powder.For DCM; METHANOL extraction 100 grms of the plant material were dissolved in DCM:METHANOL 1:1 then placed in a soxhlet evaporator and extracted at 60°C for 8 hours using a mixture of dichloromethane and Methanol (1:1) The resulting extract was then evaporated to dryness in arotary evaporator (Ugo Basile, Italy) at 40°C and a pressure of 376 Pascals.For aqueous extract 100 grams of the plant material was dissolved in 1litre of distilled water filtered . The extracts were then weighed and % yield calculated.The extract were placed in airtight amber colored sample bottle. The extracts were kept refrigerated (4°C) and used for the further investigations.

Brine shrimp lethality assay results.

In vitro lethality assay of *A. salina* was used to detect cell toxicity (Meyer et al. 1982). Brine shrimp eggs were placed in seawater (3.3% w/v sea salt in distilled water) and incubated at 25°C in front of a lamp. Eggs were hatched within 48h providing large number of larvae (nauplii).Ten number of nauplii were placed in vials containing 5ml of seawater and increasing concentrations of *Vernonia hymenolepis* leaves extract (10-1000ppm). Control was made with the same volume of 1% DMSO and also distilled water. Alive nauplii were counted after 24h and recorded as shown in the table below.The lethal Concentration (LC_{50}) was calculated.

Formalin test

Formalin test was carried out as described by Abbot *et al.,* (1999) and Bannon and Malmberg (2007).Six mice per group were randomly assigned to receive intraperitonealy 0.5ml of either 100 mg/kg of aqueous extract of Vernonia hymenolepis or Dichloromethane:Methanol in ratio 1:1.Twenty micro liters (20 µl) of 1% formalin was

injected intradermally on the plantar surface. Of the hind paw of each mouse one hour after administration of the test samples/extract. The duration of paw licking (s) as an index of painful response was determined at 0 – 5 min (Early phase) and 20 – 30 min (late phase) after formalin injection.Acetylsalicylate(ASPERGIC) was used as a positive control drug and was administrated at the dose of 100 Mg/kg,intraperitoneal,one hour before the test.Physiological saline and 1% DMSO was also used as negative control.

The Oral Acute Toxicity Testing

The oral acute toxic class method (ATC method) is a sequential testing procedure with the use of three animals(female) of one sex per step.According to ATC protocol the starting doses are 5,50,300 or 2000 mg/kg b.w based on the class limits of the Global Harmonised Classification System (GHS)(Commission,2004;oecd,2001d). The outcome(number of dead or moribund animal) will determine if further testing is necessary or if the test is terminated.

Results

At 300mg/kg body weight none of the three dosed mice died.Upon repeating the same dose as per OECD guidline none of the three dosed mice died both the aqueous and Dichloromethane:Methanol 1:1 plant extract.At adose of 2000mg/kg body weight none died at the first set of dosing in both the aqueous and Dichloromethane:Methanol 1:1 plant extract.The same dose was repeated with the three set of mice none died in aqeous extract but one died in DCM:METHANOL extract hence both the aqueous and Dichloromethane:Methanol 1:1 plant extract are in category 5 of GHS(>2000-5000 mg/kg b.w) with LD50 of 2500. Formalin test showed significant diffirence of 0.045 between asprin and DCM:METHANOL at early phase hence inticating that *Vernonia hymenolepis* posses antinociceptive activity.

Conclusion

Its concluded that *Vernonia hymenolepis* posseses analgesic property and it's not toxic since it has LD50 of 2500.Antimicrobial and phytochemistry will be determined.

ETHNOTHERAPEUTIC MANAGEMENT OF FEMALE REPRODUCTIVE HEALTH DYSFUNCTION IN TANA RIVER COUNTY, KENYA.

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Abstract

Background of the study:

Reproductive issues and ailments are some of the most frequently mentioned reasons that drive couples especially women to consult traditional healers (WHO, 2003).In Tana River; the reproductive health sector faces a number of challenges one of them being inaccessibility to reproductive health services, unmet needs and low utilization of family planning services, relatively high maternal mortality rates and unsafe motherhood (TDSP 2005-2010). Medicinal practitioners in Tana River have abundant traditional knowledge on reproductive health management including herbal contraceptives. This study documents ethnotherapeuticpractices and remedies for the management of female reproductive dysfunction in Tana River County, Kenya.

Methods: This study was carried out in Garsen, Itsowe and Ngao villages of Garsen Division between March and April 2012. Data was obtained through the use of semi-structured questionnaires, field observations and key

informants interviews. A total of 80 Pokomos, Ormas andGiryama respondents (54 men and 26 women) provided information on ethnotherapeutic remedies, ethnodiagnostic skills and related traditional knowledge utilized by the Digo community of the Kenyan Coast to diagnose malaria as a lead to traditional bioprospecting.

Results: Forty eight medicinal plants were cited. These belonged to 29 families; the commonest being Euphobiaceae. Female reproductive dysfunction(s) managed by herbalists in Tana River were pregnancy and related problems; menstrual dysfunctions, infertility and contraception.Fourteen medicinal plants were most frequently cited by herbalists for the management of the reproductive dysfunction.

Conclusions: Reproductive dysfunction is a major obstacle to social-economic development amongst the Pokomo, Orma and Giryama living in Tana River. This study has revealed a wealth of indigenous knowledge amongst the traditional practitioners in Tana River that needs to be documented for future posterity. There is need therefore for more research in collaboration with herbal practitioners, to explore the phyto pharmacological properties of the commonly mentioned medicinal plants.

PHARMACOPHYSIOLOGICAL ANTI-CANCER POTENTIAL OF MEDICINAL PLANTS USED IN KAKAMEGA COUNTY, KENYA (AN IN-VITRO STUDY).

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Abstract
Background of the study: Cancer known medically as malignant neoplasm is a broad group of various diseases, all involving unregulated cell growth whose main properties include; sustained proliferative signaling, evasion of growth suppressors, resisting cell death, enabling replication, inducing angiogenesis, activating invasion and metastasis, reprogramming energy metabolism and escape of immune destruction. Current treatment regimens include chemotherapy, radiation therapy and surgery and chances of patient survival vary greatly depending on the type and location of the cancer and the stage of disease at the onset of treatment however the effectiveness of chemotherapy is often limited by toxicity to other tissues in the body with other serious side effects. Most complementary and alternative medicines which include herbal remedies for cancer have however not been rigorously studied or tested. An increasing reliance on the use of medicinal plants in the industrialised societies has been traced to the extraction and development of several drugs and chemotherapeutics from these plants as well as from traditionally used rural herbal remedies. The objective of the present study therefore is to validate use of some of these alternative medicines by determining the anti-neoplastic properties of selected medicinal herbal remedies used by the population in Kakamega County, Kenya.

Methods: Field surveys were carried out using focus group discussions and semi-structured questionnaires (n=30) administered to randomly selected herbalists from Kakamega County. The questionnaires captured data on demography of respondents, neoplastic conditions and medicinal plants and how processed and administered, their antineoplastic uses, effectiveness, availability and toxicity as well as other relevant information.

Results: Forty medicinal plants were cited. Twelve medicinal plants were most frequently cited by herbalists for the management of cancer. The data is still under analysis.

Conclusions: The ethnobotanical survey revealed a rich composition of medicinal plants used against cancer including some that have been extensively worked on in research. More work needs to be done in laboratory analysis of the pharmacophysiological properties of the commonly mentioned medicinal plants.

DEVELOPMENT OF A BIOPESTICIDE FOR USE AGAINST MOSQUITOES FROM SELECTED PLANTS IN MSAMBWENI DISTRICT, KENYA

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Abstract
Background: Mosquito transmitted diseases lead to significant mortality and morbidity in Kenya with malaria affecting over 77% of Kenya's population. Weak conventional healthcare systems and a large traditional medicine base among the Digo community means that traditional methods are the mainstay for malaria control in south coast of Kenya. In this study plants used traditionally by the Digo community of Msambweni district in Kenya's south coast, for control of mosquitoes were identified and collected

Methods: Plants were selected based on informant consensus among authentic herbal practitioners of the Digo community and further literature search of traditional uses of plants in control of mosquitoes by the same community. Herbal practitioners identified the plants by their local names and field collection done in the month of August 2012. The plants were further identified by a plant taxonomist at the Department of Land Resource Management and Agricultural Technology (LARMAT), University of Nairobi where voucher specimens were deposited. The plant material was transported to the Department of Public Health, Pharmacology and Toxicology, Faculty of Veterinary Medicine, University of Nairobi where it was cleansed, dried under shade and ground using standard laboratory mill, then packed in air tight polythene bags while awaiting extraction and further testing.

Results: The study identified 14 plants in 14 plant species. The plants identified are *Heeria insignis* Del(stem bark), *Tagetus minuta*(leaves), *Adansonia digitata* Linn.(leaves), *Launea cornuta* (Oliv and Hiern) C.Jeffrey(leaves), *Cyperus articulatus* L.(rhizome), *Ocimum suave*(leaves), *Plectranthus barbatus*(leaves), *Azadirachta indica*(roots,leaves), *Canthium glaucum* Hiern (fruit), *Zanthoxylum chalybeum* (Eng) Engl(root), *Harrisonia abyssinica* Oliv.(root,leaves), *Solanum incanum* L(root,leaves), *Grewia trichocarpa* Hochst ex A.Rich(root) and *Lantana camara* L(leaves).

Conclusions: The Digo community, like many Kenyan communities, has a rich traditional medicine base. They use traditional methods to manage malaria including plants for mosquito control. The plants identified will be subjected to further scientific methods to evaluate their activity and efficacy against various stages of mosquitoes in order to validate their use in mosquito control.

MEETING SUMMARY

Introduction

The workshop commenced on 26th October, 2012 at 8.30 pm with a brief meeting where Prof. Kiama gave some brief about the Rise Affnet activities and its current status. He informed participants about the way forward and the possibility of its extension to 2016. He further indicated that by the end of 2013 he hoped all the students will have finished their research work and will have some publications ready. He thanked them all and invited the participants to introduce themselves.

Workshop Overview

This Workshop was organized by Rise Afnnet Nairobi Node and it provided a unique opportunity to bring together all students sponsored by the node with a view the establishing the research status of each student, provide an opportunity for the students to network and to share their experiences with each other and to interact with their supervisors

Workshop Objectives:

- To bring together all the students sponsored by the RISE AFNNET Nairobi node to present and discuss their presentations with other students and their supervisors.
- To provide opportunities for the students to develop their oral presentation skill
- To over an opportunity for students to benchmark their work with that of other students registered before or at the same time

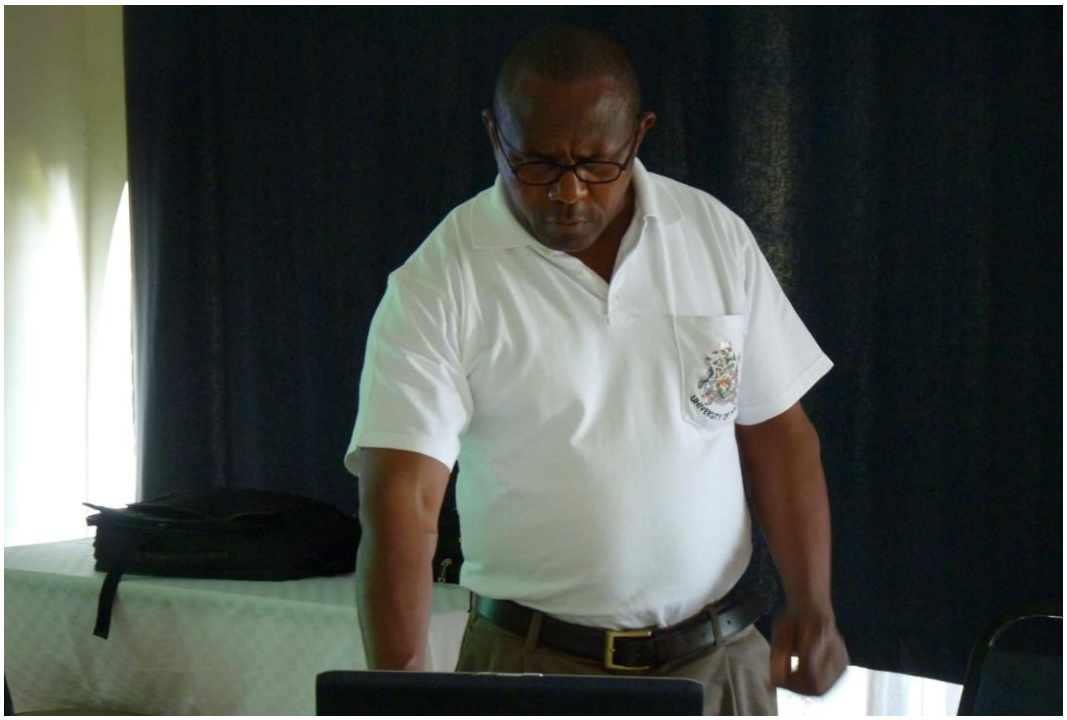
- To provide an opportunity for the students to receive recommendations from their supervisors

SESSION SUMMARIES

SESSION ONE:

The 1st Morning session was chaired by Prof. Peter Gathumbi on the 27th October, 2012 at 8.30 am after a word of prayer by Ms. Catherine Karambu.

Participants then presented their presentations on power point after which questions were posed to them by the other students and also their supervisors.



DR. D.W. GAKUYA

Effect of feeding Moringa oleifera leaf meal on intake, growth, nutrient digestibility and carcass in broiler chicken.

Introduction

Dr. Gakuya explained that Moringa oleifera is the best known of 14 species of Moringa tree (family Moringaceae) which is fast-growing and drought-resistant, native to sub-Himalayan tracts of northern India, Pakistan, Bangladesh and Afghanistan. It is currently found worldwide in the tropics and subtropics and is considered to be the most nutritious plant available on the earth.

Moringa leaves have 4 times more Beta-Carotene than that of carrots, 17 times more calcium than that of milk and 25 times more iron than that of Spinach. Its leaves and pods contain more than 90 nutrients and 46 antioxidants and is one of the richest sources of natural calcium which is why people view Moringa leaves as the natural cure for Osteoporosis.

Objectives

The purpose of this study was to investigate the effect of feeding *Moringa oleifera* leaf meal at different levels to broiler chicken with the aim of assessing it's potential in poultry production.

Conclusion

Moringa oleifera leaf meal (MOLM) can only be included in the feed to levels of up to 7.5% as higher levels affected weight gain and feed intake. The yellowing of the carcass with MOLM inclusion would benefit poultry producers due to the appealing color to consumers. However, there is need to investigate the influence of the yellow colour on eggs and study the antibiotic and coccidiostatic activity of MOLM.

Questions/comments

Pro Gathumbi asked whether there would be any other reason for color change on chicken carcass.
Prof. Mbaria asked whether the same color change would happen on human beings.
Dr. Nguta asked why he had excluded lysine and methionine from one his formulations

DR. IRENE KAMANJA

Pharmacological and toxicological study of ethnomedical herbal remedy used for management of sexually transmitted diseases in Samburu, Kenya.

Introduction

In her presentation she pointed out that globally, the prevalence rate of Sexually Transmitted Infections was 8.5%. She indicated that there is drug resistance and especially penicillin resistant gonococci that make some STIs harder to treat and that lack of resource for health care and treatment has interfered with control of STIs.

Poor infrastructure, poverty, illiteracy, and cultural practices such as polygamy, beading practice and forced marriages, has led the Samburu community to rely heavily on herbal medicine. This study documents the herbal remedies employed by Samburu Community to manage STIs and to validate their claims.

Objective of the study.

The objective of this study was to establish an inventory of plants used to manage STIs in Samburu community and determine the safety and toxicity of the priority plants.

Conclusion

The survey showed that *Clerodendrum myricoides* alone or in combination with other plants is considered as important medicinal remedy for STIs in the Samburu community. The sensitivity tests revealed that the aqueous extract of *Clerodendrum myricoides* was active against most of the microorganisms used. This extract, therefore, can be used as a non cytotoxic drug although the tocixity results classified it as slightly toxic. As a way forward, she intends to complete the sub acute toxicity tests analysis and the thesis by December 2012.

Questions /comments

Prof. Gathumbi commended her work and reiterated that Samburus should continue using the plants since it was inhibiting gonorrhea and other STIs.

Dr. Ochwang'i asked whether she considered the specificity of different bacterial strains causing STDs.

Dr. Oduma wanted to know the level of disruption of the blood vessels in the experiment versus control?

DR. STANLEY WAMBUGU

Antinociceptive Properties of Selected Medicinal Plants used in the Treatment of Chronic Joint Pains in Machakos County, Kenya

Introduction

Chronic Joint pain can be caused by a multitude of factors with osteoarthritis being the commonest with about 60% of the population above 55 years suffering from this degenerative joint disease. Musculoskeletal disorders constitute the commonest cause of disability in adults in developing countries. However, most of the available

therapies have devastating side effects, some of which are life threatening thereby making herbal therapies an option especially in developing countries.

Objective

The objective of this study was to identify the medicinal plants traditionally used to manage chronic joint pains and to test their antinociceptive potential using the formalin test in rats.

Conclusion

The findings of this study show that a variety of medicinal plants are used in the management of chronic joint pains and that the administration is mainly by oral route. The most commonly cited plants showed significant antinociceptive activity. However, further work is necessary to evaluate the efficacy of the refined extracts as well the safety and standardization of the remedies used in pain management in Machakos.

DR. JOSEPH NGUTA

Antimalarial activity of some plants traditionally used in treatment of malaria in Msambweni district of Kenya

Introduction

Natural products from plants as drug sources met health needs of humans when no synthetic drugs and surgical concept existed. The material culture of every civilization is based more on plants than on animals, with the world witnessing growing scientific and commercial interests in medicinal plants, mainly due to their immense economic potential and their widespread cultural acceptability. WHO has listed 21,000 species of medicinal plants that 80% of the 5 billion people in the developing World rely on for herbal remedies for their basic health care needs.

Objective

The study was designed to evaluate the antimalarial activity and in *vivo* toxicity of selected plants including *Adansonia digitata*, *Securidaca longenpendunculata, Flacourtia indica, Ocimum gratissimum and Hoslundia opposita* from Msambweni district, Coast province, Kenya.

Conclusions

The above plant species were shown to possess promising antimalarial activity and were non-toxic to mice. These results indicate that there is potential for isolation of new scaffolds against *Plasmodium falciparum* from the aqueous extracts of the five plant species.

Question/Comments

Asked by Dr. Ochwang'i what would have been the effect had he combined all the aqueous extracts, Dr. Nguta responded that he had not test for the combination. He was also asked to indicate whther the tocicity was selective to plasmodium parasites to which he indicated that the experiments are still pending..

SESSION TWO – CHAIRED BY DR MBAABU MATHIU

MS. KARAMBU MURIITHI

Ethno-Botanical Uses and Phytochemical Analysis of Cyperus articulatus from Tharaka Meru

Introduction

The absence of modernized socio-economic and public healthcare systems has reinforced the reliance of low-income earners on the use of traditional medicines sourced from plants and other living organisms.

WHO and governments in most developing countries are campaigning for the promotion and integration of herbal remedies in healthcare. *Cyperus articulatus* was selected for this study due to its use as a drug and other uses in the Ameru tradition.

The study was conducted in Tharaka district situated in the semi arid parts of the larger Meru region where medical services are not easily accessible due to poor roads thereby making TMPs the most accessible and affordable with *C. articulatus* being one of the most widely used.

Objective

The objective of the study was to document the ethno botanical uses and determine the components of *Cyperus articulatus* articulates especially in Tharaka district, to extract root tubers using organic solvents and to determine the components of the extract using chromatographic and spectroscopic methods. Other objectives were to carry out anti-bacterial assays on the extract and mosquito repellency test on the extract.

Conclusion

The study recommended the formulation of *Cyperus articulatus* as a perfume, deodorant, air freshener, mouth-freshener and a mosquito repellent. It should also be examined for anti- allergic effects because its sweet smell

does not seem to affect people who are allergic to other commercial perfumes. The research should also be extended to the other *Cyperus* species found in the area of study like *Cyperus rotundus* which is reported to have related compounds.

Questions /comments
Asked by Mr. Musau at what concentration the *cyperus articulatues* repelled the mosquitoes, she responded that the crude extract was used neat.

DR. JOHNSON NASIMOLO

Erythrina abyssinica ameliorates meningoencephalitis and conserves proteins in Trypanosoma brucei brucei chronic mice model

Introduction
Dr. Nasimolo reported that 80% of the population in developing countries relies on traditional medicine for primary health care and it is also estimated that 25% of modern drugs have been derived from plants. They have an important role to play in the maintenance of health and in the introduction of new treatments.

Plant extracts have been used in the treatment of diseases for a long period of time but the basis of their use has not been scientifically validated. *Erythrina abyssinica for example ha*s been widely used as a medicinal plant in the East African region for the treatment of malaria, allergy, elephantiasis, trachoma, syphilis, burns and swellings.

Objectives

The objective of the study was to validate the medicinal use of *Erythrina abyssinica, t*o evaluate effect of *Erythrina abyssinica* aqeous and methanol extracts on trypanosome induced neuroinflammation and to observe structural changes in cerebral cortex of *Trypanosoma brucei* chronic mice model.

Conclusion

The study demonstrated the anti-inflammatory and protein conserving properties of *Erythrina abyssinica,* thereby, validating its popular use as a medicinal plant. However, he noted the need for further studies.

Questions /comments

Mr. Musau asked whether he used the SDS- PAGE electrophoresis to separate the proteins while Dr. Karambu wished to know whether he had used crude extract.

Asked by Prof. Kiama to explain about protein, he responded that he had used brain protein after grinding the whole brain. He was further asked by Dr. Oduma what he had used for electrophoris as the results were not clear.

MS. CLARE NJOKI

Hypoglycemic Activity of *Zanthoxylum Chalybeum* in Diabetic Rats

Introduction

Globally diabetes prevalence has been rising with 171 million cases having been reported in 2000 which rose to 230 million in 2006. In Africa, diabetes was at 7 million in 2007 and the prevalence is expected to rise to 18 million by 2030. In Kenya, prevalence was at 3% in 2003 which rose to above 6% in 2007. High cost of antidiabetic drugs and poor glycemic control has led to dependence on alternative treatment.

Zanthoxylum chalybeum is a deciduous spiny shrub or tree that is used to treat diabetes mellitus related symptoms in Kenya, Tanzania and Asia.

Objectives

To investigate the effect of *Z. chalybeum* extract on experimentally induced type 1 diabetes in Wistar rats, analyze the plant for principal chemical groups, evaluate the hypoglycemic activity of *Z. chalybeum* extract in normal and diabetic rats and compare plasma glucose, weights, food intake, water intake, urine output and glucose tolerance.

Conclusion

Z. chalybeum demonstrated mild hypoglycemic activity in a dose-dependent manner and the presence of flavonoids and tannins may have been responsible for the slight hypoglycemic activity observed. Further research is recommended to determine efficacy at different dosages and the possible biological activity of *Z. chalybeum* for the treatment of diabetes mellitus.

Question/Comments

Dr. Oduma asked her what informed or why she chose the particular plant for the study.

She was also ask to explain why the control drug showed no effects in her experimental set up.

Ms. Njoki said she would repeat some of the experiments and provide results in next Rise Afnnet workshop and was then advised to pay close attention to her experimental procedure.

SESSION THREE - PROF. JAMES MBARIA
DR. JAMES KURIA
Wound healing, safety and antimicrobial activity tests for Aspilia pluriseta schweinf. (Asteraceae).

Introduction
It is reported that approximately 50% of drugs in clinical use are from natural products or their derivatives. Africa constitutes about 25% of global genetic pool yet there is little contribution to natural products based industry. Wound healing abnormalities, deformity and disability are costly and substrate for infection, yet few cost effective remedies are available. Currently *A. pluriseta* is used for the treatment of conjunctivitis and other eye disorders, dyspepsia, stomach pain and related ailments, injuries cuts or wounds, bacterial and fungal skin conditions, abcesses, boils, pruritus, skin ulcer and other skin conditions, diarrhea, cough, pneumonia, chest pain and related complaints, mumps otitis, otalgia and related complaints, post-partum disorders, helminthoses and other endoparasitoses and bleeding.

Objectives
The objective of the research was to study the wound healing efficacy of *Aspilia pluriseta*, its phytochemistry and toxicity. The study also sought to evaluate the wound healing activity of *Aspilia pluriseta* powder on excision wounds in mice, determine the antifungal and antibacterial activity of methanolic extract of *Aspilia pluriseta*, screen qualitatively the phytochemicals in the methanolic extract of *Aspilia pluriseta*; and, investigate the occurrence of adverse effects after topical administration of *Aspilia pluriseta* powder ointment.

Conclusion
The results showed some wound healing enhancement, with ointment from the test plant comparing favorably with the standard drug in terms of epithelialization time and wound contraction. There was marginal, nonspecific antimicrobial activity against the bacteria and fungus tested. The test plant ointment induced moderate sensitivity in guinea pigs.

Questions /comments
Asked by Dr. Ochwangi why he chose this particular plant for the study, he responded that he has grown some interest from the literature he has been reading on the plant that also grows from where he comes from.

Dr. Ochwangi also wanted to know whether he had acquired a permit from the animal ethical and safety committee.

DR. ZACHARY RUKENYA

In vitro Antimicrobial & Cytotoxic Activity of Aloe turkanensis, an Ethnomedical Herbal Remedy Used in Turkana, Kenya

Introduction

Aloe turkanensis is a shrub that grows naturally and is also cultivated in Baringo, Isiolo, Laikipia, Turkana and West Pokot counties.

The Turkana people of Kenya apply the leaf sap of *Aloe turkanensis* to wounds and as a cure for eye diseases. It is also used to treat malaria, stomachache, ringworms and poultry diseases. The juice from boiled roots is added to a drink to induce vomiting which is said to relieve persistent headache. The roots are also used to flavour beer.

Objectives

The objective of the study is based on the hypothesis that the Aloe-working group herbalists recognize that wounds, eye infections, fungal infections, stomach upsets and skin infections involve pathogenic micro-organisms and that the plant *Aloe turkanensis* has metabolites capable of inhibiting or killing these microbes without causing adverse effects on the herbal consumer.

The study then seeks to test this hypothesis by determining the bioactivity of the plant's extract on the growth of *Bacillus cereus, Staphylococcus aureus, Pseudomonas aeroginosa, Escherichia coli, Candida albicans* and laboratory cultured *Artemia salina* leach.

Conclusion

Based on interviews conducted in the field and the subsequent in vitro laboratory testing of the sampled plant, it was concluded that the plant has metabolites that inhibit the growth of some bacterial organisms and is a relatively safe herbal remedy when used for human consumption.

There is still pending work with regard to the secondary metabolites responsible for the above activity, type of toxicity and the significance of the noted biological activity.

DR RONALD OKINDO

Photochemistry and evaluate the safety of a medicinal palnt used in kenya for oral health.

Introduction

Ethno medicine is a field of study that covers health care systems which includes beliefs and practices relating to disease and health, which are products of indigenous cultural development and are not derived from a conceptual framework of modern medicine. Herbal medicine has been incorporated into conventional drugs and products like tooth-paste to counteract the anti-microbial resistance of conventional medicine and products in oral healthcare systems.

Most oral diseases are due to bacteria infections and medicinal plants offer considerable anti-bacterials activity against various micro-organisms. Current antibiotics such as penicillin and erythromycin are effective in both animals and humans but are not used clinically due to their many adverse effects. This drawback gives the gap for further research and development of natural anti-bacterials that are safe to the host and specific for oral pathogens.

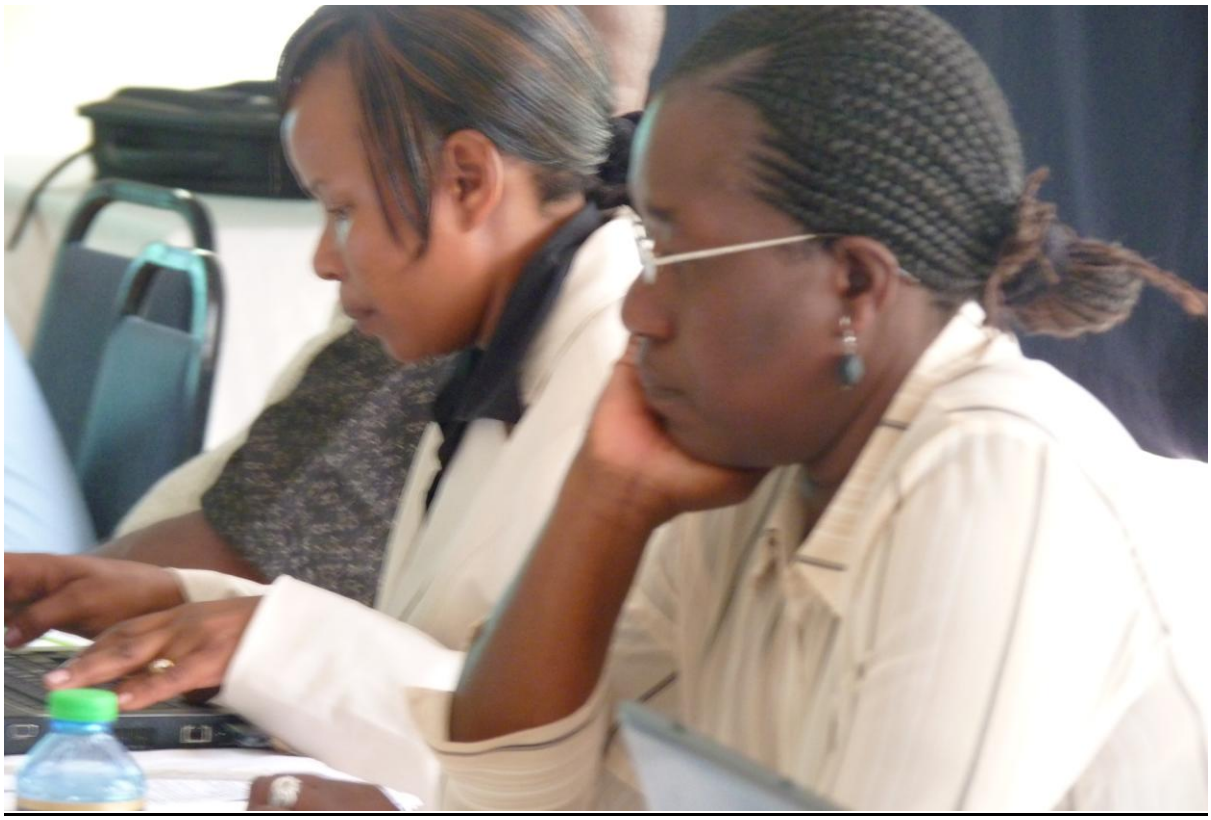
Objectives

The objective of this study is to determine the efficacy and evaluate the safety of *Vernonia hymenolepis* obtained from Kitale county in Kenya, conduct comparative antimicrobial activity using in-vitro antimicrobial assay

techniques, determine the analgesic potency of DCM: Methanolic extract of *vernonia hymenolepis,* determine the acute toxicity of *vernonia hymenolepis* to brine shrimps lethality test and LD50 in mice and finally, find out the active ingredients of *Vernonia hymenolepis* through photochemistry tests.

Conclusion

The plant possesses anti-nociceptive activity since there is significant difference between asprin and aqeous extract at 0.025 in early phase and also between asprin and DCM;methanol extract at 0.037 in late phase.
The plant shows no acute oral toxicity hence it is not toxic.



DR CATHERINE K KAINGU

Ethnotherapeutic management of female reproductive health dysfunction in Tana river county, Kenya.

Introduction

Reproductive health issues constitute 18% of global burden of disease for women of reproductive age and are a major cause of maternal mortality in developing countries. Indigenous herbs have been used for the management of reproductive health since prehistoric times. Reproductive ailments are some of the reasons that drive women to consult herbalists in Tana River county. This is occasioned by the inaccessibility to reproductive health services and low utilization of family planning services.

The plant species cited by herbalists for the treatment of most reproductive dysfunctions were; *Markhamia zanzibarica* and *Plectranthus barbatus*, *Boscia coriaceae pax* and *Combretum hereroense Schinz*, *Croton menyharthii* pax, *Uvaria leptocladon*. Some of these plants were used to manage more than one condition.

Objectives
The main objective of this study was to document and identify medicinal plants used for the management of female reproductive health dysfunction in Tana River county.

Conclusion
The study is still on-going and is expected to be complete by the end of next year (2013).

Questions/comments
Asked by Dr. Nasimolo how the herbalists were able to diagnose fibroids and breech presentation, she explained that they were able to do this from the patient's description of their symptoms. He further wanted to know what she postulated to be the mode of action of the plant in remedying breech presentation.

DR. DOMINIC OCHWANG'I

Pharmacophysiological anti-cancer potential of medicinal plants used in Kakamega county, Kenya (an in-vitro study).

Introduction
Cancer accounts for 13% of all deaths yearly totaling to about 7.6 million people. The most common cancers include; Lung cancer that cause 1.4 million deaths, stomach cancer 74,000, liver cancer 700,000, colorectal cancer 610,000 and breast cancer 460,000. Half of these cases are found in the developing world. In Kenya 50 people die daily from various cancers with 80,000 cases diagnosed each year.

Although current therapies are effective in killing cancer cells they also kill normal cells. In addition, convectional cancer treatments are too costly thereby making majority of patients to resort to herbal remedies. However, most complementary and alternative anti-cancer remedies have not been well studied, especially in Kenya. There is, therefore, need to identify and document anti-cancer herbal remedies and determine how effective, safe, practical, reliable, affordable, accessible and if they can be self-administered and whether they are culturally acceptable.

Objectives

The objective of this study was to identify and document anti-neoplastic medicinal plants used in Kakamega County, Kenya, determine the bioactivity and brine shrimp toxicity of the candidate herbal extracts, analyse the invitro anti-neoplastic efficacy of the herbal extracts using human cell cultures and analyze the phytochemical constituents in selected plant extract(s).

Conclusion

In total forty seven medicinal plants were cited while twelve were most frequently cited by herbalists for the management of cancer. However, the data is still under analysis.

Questions /comments

Dr. Nasimolo asked what he would use to specifically stain nuclear since DAPI is a substrate rather than a stain. He further advised him that rather than using DAPI that requires a fluorescent microscope which is not available, he could consider using a different substrate that uses the normal microscope.

Asked by Ms. Karambu to give some of the causes of cancer in the environment and how they can be averted he responded that smoking, aflatoxin and preservatives were leading causes and could averted by avoiding them.

Dr. Kuria asked what ethnodiagnostic methods were available for cancer among traditional medicines practitioners.

MR JOSEPH MUSAU

Development of a biopesticide for use against mosquitoes from selected plants in Msambweni district, Kenya

Introduction

He pointed out that there are about 3500 mosquito species that occur in all continents except in Antarctica. Mosquito's bites cause nuisance, allergy, dermatitis and secondary infections. Mosquitoes are vectors for malaria, filariasis and arboviruses, dengue, rift valley fever, yellow fever, endemic in Africa and Americas and west nile that is endemic in the Americas. Mosquitoes of greatest importance to humans are *Anopheles*, *Aedes* and *Culex.* Current control methods are biological, physical and chemical which include indoor residual spraying and use of repellents.

Despite the long usage and advantages of plant derived repellents there is little effort to investigate and promote the traditional use of plant-derived natural repellents.

Objectives

The objective of the study was to determine dermal irritation/corrosive potential of the selected plants, analyze their genotoxic potential, evaluate mosquito repellent activity, establish their larvicidal activity, formulate and assess the efficacy of the plant based mosquito repellent.

Conclusion

This study is part of ongoing project on ethnobotany, ethnopharmacology and ethnodiagnostic skills of the Digo community of Msambweni District, South Coast of Kenya.

Questions /comments

Dr. Nasimolo wanted to know how possible it was for a plant to act both as repellant and a larvicidal. He also wondered if it would have been better to look for different lavicidal plants that can be used along with repellants to have the repellant push away the mosquito and have an attractant in a different area where a larvicidal plant will be placed to kill them.

CLOSING SESSION and Closing remarks

The workshop was officially closed by Prof. Kiama who thanked all participants for their attendance, engagement and the wealth of experience they shared. He further commended the participants for their active participation during the workshop sessions and expressed his satisfaction for the achievements reached so far.

Participants were encouraged to target and attend scientific conferences to hone their skills in order to realize their goals in research work. He informed the participants about the Rise Affnet website which is still under construction. He also informed them that there will be a Rise Affnet meeting in Kampala next year and perhaps another at end of the same year for all networks to discuss the progress of all students.

Prof. Gathumbi promised to share some recent calls for proposals.

Dr. Mbaria indicated that it would be advisable to put together the course content for the MSC program in Natural products and Bioprospecting in form of a manual. The meeting agreed that all will contribute in putting the manual together and Prof Mbaria will lead in this initiative.

Dr. Dominic Ochwangi suggested that the participants review and publish a book with different chapters on natural products since all of them were working on different research areas.