CATEGORISED ABSTRACTS

FOR THE 27TH MEETING OF THE INTERNATIONAL SCIENTIFIC COUNCIL FOR TRYPANOSOMIASIS RESEARCH AND CONTROL (ISCTRC)

Pretoria – South Africa

September 29th – 3rd October, 2003

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618 EVALUATION OF THE EFFICACY OF NEW DELTAMETHRIN-BASED INSECTICIDE FORMULATIONS AGAINST GLOSSINA PALLIDIPES IN KENYA.

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Njoku, C.I.; Uzoigwe, N.R.; 1Ajagbonna, V.N.; 2Abubakar, A.; Usman,B.M.
(Parasitology Section, Entomology and Parasitology Division, Nigerian Institute for Trypanosomiasis Research (NITR),
PMB 03, Vom, Plateau State, NIGERIA)

705 REPORT ON ASPECTS OF THE SOCIOECONOMIC RESEARCH ACTIVITIES IN THE NIGERIAN INSTITUTE FOR TRYPANOSOMIASIS (NITR), I. TSETSE AND ANIMAL TRYPANOSOMIASIS - Njoku, C.I. and *Halid, I

706 REPORT ON ASPECTS OF THE SOCIO-ECONOMIC RESEARCH ACTIVITIES IN THE NIGERIAN INSTITUTE FOR TRYPANOSOKMIASIS RESEARCH (NITR). II. TSETSE AND HUMAN AFRICAN TRYPANOSOMIASIS - Njoku, C.I. and *Halid, I.

707 COMMUNITY KNOWLEDGE, ATTITUDE AND AVAILABLE HEALTH CARE SERVICES FOR HUMAN AFRICAN TRYPANOSOMIASIS IN DURBI VILLAGE, JOS EAST LOCAL GOVERNMENT AREA, PLATEAU STATE, CENTRAL NIGERIA.
Njoku, C.I.; Dadah, A.J., *Onyekwelu, N.A.; *Iliyasu, B.; *Bashir, Y.A.; Dede, P.M. and **Ajagbonna, V.N.

708 SOCIO-ECONOM IC ON PASTURALIST COMMUNITIES - Khitma Hassan M. Elmaliki KHARTOUM, SUDAN

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710 A SOCIO-ECONOMIC APPRAISAL OF CURENT PRACTICES, CONSTRAINTS AND OPPORTUNITIES OF LIVESTOCK HEALTH, PRODUCTION AND UTILIZATION IN THE TSETSE-INFESTED TRANSMARA DISTRCT, KENYA (KETRI)

711 COMMUNITY PERCEPTION OF ANIMAL TRYPANOSOMIASIS IN DURBI VILLAGE, JOS EAST LOCAL GOVERNEMENT AREA OF PLATEAU STATE, CENTRAL NIGERIA
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712 COMMUNITY KNOWLEDGE, ATTITUDE AND AVAILABLE HEALTH CARE SERVICES FOR HUMAN AFRICAN TRYPANOSOMIASIS IN DURBI VILLAGE, JOS EAST LOCAL GOVERNMENT AREA, PLATEU STATE, CENTRAL NIGHERIA
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802 ENVIRONMENTAL AND GENETIC EFFECTS ON GROWTH OF N'DAMA CATTLE RAISED UNDER TSETSE CHALLENGE : N.A. Bosso, E.H. van der Waaij, K. Agyemang, J.A.M. van Arendonk - THE GAMBIA (POSTER)

803 APPLICATION OF GEOGRAPHICAL INFORMATIONL SYSTEMS IN STUDYING THE EPIDEMIOLOGY OF SLEEPING SICKNESS IN KENYA.
Rutto, J.J., Matete, G.O., Sulo, J. and Ndungu, J.M.

. Omolo.

om: clement mangwiro [tncmangwiro@yahoo.co.uk]
ent: Tuesday, April 29, 2003 4:06 PM
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:s Omolo

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Zimbabwe)

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untry Report: ZIMBABWE - Using GIS to analyse trends
tsetse and trypanosomiasis control in Zimbabwe
nce 2001.

N. C. Mangwiro and A. Chamisa

etse and Trypanosomiasis Control Branch, Department
Livestock and Veterinary Services, P.O. Box CY 52
useway Harare, ZIMBABWE

STRACT

ypanosomiasis control was achieved in most parts of
mbabwe by the control of the vector. control of the
ctor was carried out intensively or extensively
ing various methods. Funding was internal and
ternal in the last twenty years. Funding was
duced in 2001 following the completion of the
gional Tsetse and Trypanosomiasis Control Programme
TTCP). Tsetse control has largely been government
nded since then. Odour-baited insecticide treated
ue/black/blue targets have remined the main method
control and there are currently 60000 targes
ployed in 20000 km2. Targets are deployed
ctically in grid formation, along drainage lines and
barriers along the North-eastern front.
secticide treated cattle form a wide band of control
hind the area under targets. Computerisation of the
pping office has enabled a more detailed analysis to
carried out. Trends in activity and projected
ans are presented. Continued tsetse control
tivities have kept Trypanosomiasis cases at less
an 10 per year in the country. although the area
claimed using targets has been low, however tsetse
tches in infested areas have decreased by at leasst
%. In addition the Branch has successfully
fended cleared areas against tsetse reinvasion using
rriers of targets.

mbabwe has continued to carry out reserach in tsetse
haviour and ecology. Research on the effects of
oke as a repellent and kraal design were carried
t. Studies on new dips and pour-on formulations were
rried out as well as the study of the effects of

hank you very Much

lement Mangwiro



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Oral Eflornithine monotherapy in late stage T.b gambiense Trypanosomiasis (results observed in 25 patients treated in Daloa Côte d'Ivoire)

Félix DOUA, Norbert Djè N'goran , Tanoe Miézan Wamian et Félix Boa Yapo

ABSTRACT

25 patients with late stage T.b. gambiense trypanosomiasis were treated with oral Eflornithine . These patients were divided in two groups A and B .
Patients of group A (n= 12) were treated with oral Eflornithine at the dosage of 400 mg/kg/day during 14 days and patients of group B (n=13) received oral Eflornithine at the dosage of 500 mg/kg/day during 14 days .
In the two groups of patients the initial cure rate (disapearance of trypanosomes from bodyfluid 24 hours after the end of treatment) was 100% .
Side effects were marked by digestive and hematologic disturbances and have been all reversible at the end of treatment course . No case of death were registered during treatment .
During follow-up one patient died home from pneumonia 4 months after the end of his treatment . Eight cases of relapses (32%) were noted in which 4 were from group A and 4 from group B.
Out of the 16 patients who are still in account , there is no new case of relapse but one patient is lost for follow-up . Out of the 15 patients who are under follow_up , one has 6 months of follow-up , 10 have 12 months of follow-up , 3 have 18 months of follow-up and one 23 months of follow-up without relapse.
In this study there were no difference in the two dosages of oral Eflornithine in terms of tolerance and efficacy.
Search for maximum dosage of oral Eflornithine tolerable and effective in late stage T.b. gambiense trypanosomiasis is necessary for the registration of the oral route of Eflornithine .

L'EFLORNITHINE ORALE DANS LE TRAITEMENT DE LA TRYPANOSOMIASE HUMAINE AFRICAINE A T.B GAMBIENSE EN PHASE NERVEUSE

(Résultats observés chez 25 patients à Daloa – Côte d'Ivoire)

Félix DOUA , Norbert Djè N'goran , Tanoe Miézan Wamian et Félix Boa Yapo

Résumé

25 patients en phase nerveuse de la trypanosomiase humaine africaine (THA) ou maladie du sommeil ont reçu de l'Eflornthine en monothérapie par voie orale . Ces patients ont été divisés aléatoirement en deux goupes A et B . Les patients du groupe A (n=12) ont reçu 400 mg/kg/j d'Eflornithine pendant 14 jours et ceux du groupe B (n=13) ont reçu 500 mg/kg/j pendant 14 jours .

Dans ces deux groupes de patients , le taux de guérison initiale (disparition des trypanosomes des liquides biologiques 24 heures après la fin du traitement) a été de 100%. Les effets secondaires du traitement marqués par les troubles digestifs et hématologiques ont été tous réversibles à la fin du traitement et aucun cas de décès n'a été enregistré au cours de l'hospitalisation des patients .

Pendant le suivi après traitement , un patient du groupe A est décédé 4 mois après la fin de son traitement à son domicile des suites d'une pneumopathie . 8 cas de rechute (32%) ont été notés au total dont 4 du groupe A et 4 du groupe B .

Sur les 16 patients encore en compte aucun nouveau cas de rechute n'est observé , mais un patient reste toujours perdu de vue 18 mois après la fin de son traitement . Sur les 15 patients restants , un a un recul de 6 mois après traitement , 10 ont un recul de 12 mois , 3 ont un recul de 18 mois et un a un recul de 23 mois .

Dans cette étude il n'a pas été notée de différence au plan de la tolérance et de l'efficacité entre les deux posologies de l'Eflornithine orale.

La recherche d'une dose maximale orale bien tolérée et efficace reste nécessaire pour l'enregistrement de cette formulation de l'Eflornithine dans le traitement de la THA à T.b. gambiense .

Abstract to the 27th Meeting of the ISCTRC, Pretoria, South Africa, September 29th 3rd October, 2003

Title: Baseline Survey on Tsetse and Trypanosomiasis on Mafia Island Prior to Tsetse Eradication.

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ABSTRACT:

The tsetse fly (*Glossina*) transmits trypanosomes that cause African trypanosomosis to livestock (nagana) and to humans (sleeping sickness). In Tanzania, tsetse flies infest 60% of the mainland and have been a limitation to the country's development. Losses due to animal mortality and reduced milk yield are estimated at US$ 7.98 million annually.

Sustainable means of controlling the disease can be achieved through eradication of the vector (tsetse flies). Efforts towards this direction in Tanzania began more than 70 years ago, but success remained short lived in most cases because tsetse population in tsetse-suppressed areas frequently recovered. The application of the sterile males to transfer sterile sperm to wild females (Sterile Insect Technique - SIT) seems to be the solution. Mafia Island provides a unique opportunity for successful tsetse eradication in that it is isolated with only one tsetse species and has the potential of becoming a disease free zone.

The purpose of this paper is to describe the tsetse and trypanosomiasis surveys that were carried out as a preparatory phase for eventual eradication of tsetse flies on Mafia Island. Sticky panels were used to trap tsetse flies and the results indicates that almost the whole island is infested by *G. brevipalpis* with higher apparent densities (up to 9.5 flies per trap per day) in thickets. Trypanosomiasis survey indicates a prevalence of 0.4% in February and 1.2% in August 2002.

Répartition des glossines en Guinée

M . F . ONIKOYAMOU

Résumé

Par sa position géographique, la Guinée constitue une zone de transition entre la forêt et la savane. Avec ses forêts denses humides, ses galeries forestières et ses savanes pré forestières, avec une température ambiante comprise entre 16°c et 35°c et une pluviométrie supérieure à 1200 mm, elle constitue également un milieu de prédilection des glossines dans les 4 régions naturelles correspondantes aux zones agro-écologiques du pays.

Aucune carte de répartition des glossines sur l'ensemble de la Guinée n'a jusqu'ici été publiée. A part plusieurs cartes à petites échelles, intéressant soit l'Afrique Occidentale d'expression française, soit l'ensemble de l'Afrique au Sud du Sahara.

Les enquêtes entomologiques ont été réalisées sur les glossines à différentes périodes de l'année tant en saison sèche qu'en saison des pluies dans les quatre(4) régions naturelles de la Guinée au cours des années 1992 et 1993 en Moyenne Guinée, en Haute Guinée et en Guinée Forestière, et en 1995 et 1997 en Guinée Maritime.

A l'issue de ces enquêtes, six(6) espèces de glossines ont été rencontrées G.p palpalis, G. p. gambiensiis, G.tachinoides ; G. m. sub-morsitans, G. longipalpis et G. fusca-fusca..

Bien que ces enquêtes ponctuelles ne donnent qu'une idée fragmentaire sur la répartition des espèces et de leurs densités, elles ont permis de localiser certains foyers et de donner une idée sur la répartition des glossines en Guinée

***Mots Clefs**: glossines, répartition, température, pluviométrie, régions naturelles, la Guinée*

The distribution of glossinas in Guinea.

M . F . ONIKOYAMOU.

Summary

By its geographical position, Guinea constitutes a transit area between the forest and the savannah, with its humid rain forest, forest galleries, its temperature between 16°c and 35°c and its rainfall above 1200mm guinea constitutes a best location for the glossinas. The four natural regions correspond to the four agro-ecological areas of the country.

Up to now, no distribution map of glossinas for the whole country has so far been publised. There are only maps covering small areas of French speaking west Africa or the whole Sub Saharan Africa.

Entomological surveys have been carried out at various times of the year in both dry season and rainny season in four natural regions of Guinea from 1992 to 1993 in Uper Guinea, Middle Guinea and Forest Guinea,in 1995 and1997 lower Guinea.

After those surveys, six species of glossinas have been identified to be G.P palpalis, G.P gambiensis , G.trachinoïdes, G.m Submorsitans G.longipalpalis et G.fusca fusca.

Although, these surveys carried out from time to time have only given fragmented idea about the distribution of glossinas and their density, they have helped locate some areas and give an idea about distribution of glossinas in Guinea.

***Key words** : glossinas,*

distribution, temperature, rainfall, natural regions, Guinea

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I Introduction:

La Guinée avec ses forêts denses humides, ses galeries forestières et ses savanes pré forestières, avec une température ambiante de 16° c à 35° c et une pluviométrie supérieure à 1200 mm, elle constitue un milieu d'élection des mouches tsé-tsé ou glossines vecteurs des trypanosomoses animale africaine(TAA) et humaine(THA) ou maladie du sommeil.

Aucune carte de répartition des glossines sur l'ensemble de la Guinée n'a jusqu'ici été publiée. A part plusieurs cartes à petites échelles, intéressant soit l'Afrique Occidentale d'expression française, soit l'ensemble de l'Afrique au Sud du Sahara.

En 1948-1949 Vilain publie une carte au 1/3000.000^{e} sur la répartition des glossines en Afrique Occidentale francophone.

Ces données sont reprises en 1953 par Potts qui établit une carte de répartition au 1/5000.000^{e} pour l'ensemble de l'Afrique. A la suite de nouvelles prospections, Rickenbach publie en 1961 une carte au 1/10.000.000^{e}, de l'Afrique Occidentale, qui mentionne la présence des glossines par degré carré.

Enfin en 1963 Ford, et en 1973 Ford et Katondo présentent des cartes de répartition pour l'ensemble de l'Afrique, qui reprennent les données antérieures

Ces cartes sont imprécises en raison de leurs trop petites échelles. Depuis leur établissement des modifications apportées par l'homme à la végétation, et aux densités de gibier et de bétail ainsi que les variations climatiques de ces dernières années ont pu entraîner des bouleversements considérables dans les aires de répartition de diverses espèces de glossines.

La Direction Nationale de l'Elevage dans le cadre du «programme de lutte contre la trypanosomose animale » a fait entreprendre des enquêtes entomologiques sur les glossines par Laboratoire Central de Diagnostic Vétérinaire de Diagnostic (LCVD) dans certaines régions du pays

Déterminer les différentes espèces et sous espèces de mouches tsé-tsé ou glossines présentes dans les zones agro-écologiques et actualiser une carte de répartition des glossines en Guinée est l'objectif de cette étude.

II Matériel et méthode

2-1- zones d'étude

Les enquêtes entomologiques sur les glossines ont été réalisées à différentes périodes de l'année tant en saison sèche qu'en saison de pluies dans trois régions naturelles de la Guinée au cours de quatre(4) campagnes de prospection entomologique sur les glossines.

Les enquêtes entomologiques sur les glossines dans les préfectures de Beyla, Kérouané, Mandiana, Kankan et Kouroussa de janvier à juillet 1992.

– Enquêtes entomologiques dans les préfectures de Siguiri, Dinguiraye, Dabola, Faranah et Mamou de janvier à septembre 1993.

- Enquêtes entomologiques dans les préfectures de Boké, Boffa, Fria, Kindia et Telimélé de janvier à juin 1995, Dubréka et au CAE de Boké en février 1997.

2–2- Méthode de travail

Sur le terrain des séances de capture de glossines sont organisées à l'aide de pièges biconiques Chalier–Laveissière, et de pièges mono coniques Va Voua placés le long des cours d'eau, des routes et dans les endroits écologiquement propices aux glossines à des distances de 300 à 500 m puis retournant au point de départ pour une capture manuelle à l'aide de filets de capture. Ils ont été relevés au cours de l'après –midi. Les captures ont lieu dans des conditions différentes et pendant un laps de temps inconstants les glossines capturées ont été regroupées par tournée de capture, puis déterminées et dénombrées selon les espèces et le sexe une partie de chaque échantillon est conservée dans des flacons contenant de l'alcool à 70% et envoyée au Laboratoire Central Vétérinaire de Diagnostic (LCVD) de Conakry.

Dans toutes les zones d'enquêtes deux équipes de travail sont constituées : une conduite par moi-même et l'autre par le technicien spécialisé pour l'exécution des opérations.

III Résultats par campagne de prospection

3 -1- Résultats campagne de prospection 1992

Tableau I Récapitulative des glossines dans les zones de prospection 1992

Préfectures	Espèces Rencontrées	Nombre de glossines attrapées par						Total	D.A.P par espèces	D.A P Totale
		pièges			Capture manuelle					
		M	F	Total	M	F	Total			
Beyla	G. palpalis	27	35	62	2	4	6	68	1,24	
	G.m.submorstans	10	16	26	8	15	23	49	0,52	
	G. longipalpis		3	3	2	4	6	9	0,15	2,71
	G. fusca- fusca	3	5	8				8	0,8	
Kèrouané	G. palpalis	46	50	96		2	2	98	1,6	
	G.m.submorstans	9	11	28	10	17	27	55	0,46	2,2
	G. longipalpis	1	4	5			5	5	0,125	
Mandiana	G. palpalis	42	69	111	3	3	6	117	0,85	
	G. tachinoides	4	7	11				11	0,18	1,53
	G.m.submorstans	19	28	47	28	44	72	119	0,36	
	G. longipalpis	3	7	10	5	12	17	27	0,14	
Kankan	G. palpalis	2	12	17				17	0,42	
	G.m.sub morstans		4	4	9	11	20	24	0,1	0,55
	G. longipalpis		1	1				1	0,02	
Kouroussa	G. papalis	10	22	32	4	7	11	43	0,45	
	G. tachinoides	7	15	22		3	3	25	0,31	0,23
	G.m.sub morstans	3	6	9	17	26	43	52	0,12	
	G. longipalpis	1	4	5			5	10		
Total		187	302	489	88	158	246	735		

Densité apparente DAP = G : (P x J)

G = Nombre de glossines capturées
P = Nombre de pièges déployés
J = Nombre de jours de capture

Tableau 2 : Synthèse récapitulative des glossines 1992

Espèces rencontrées	Nombre de glossines attrapées par			Pourcentage Des mâles par		Pourcentage des espèces par			Densité	Pourcentage cap par pièges
	Pièges	Capture Manuelle	Total	Pièges	Capture manuelle	Pièges	Cap manuelle	Total		
G. palpalis	318	25	343	39,93	36	92,7	7,3	100	4,56	92,7
G. tachinoïdes	33	3	36	33,33	100	91,66	8,34	100	o,49	91,66
G. m. submorsitans	114	185	299	35,96	38,91	38,12	61,88	100	1,75	38,12
G. longipalpis	24	33	57	20,83	21,21	42,1	57,9	100	0,50	42,1
G. fusca-fusca	8	0	8	37,5	0	100	0	100	0,8	100
Total	497	246	743							

Moyenne générale de la densité = 1,62 glossines par piège par jour

3 -1-1 zone de Beyla Guinée Forestière

Quatre(4) espèces glossines ont été rencontrées, ce sont par ordre d'importance :
G.palpalis s.i : qui est trouvée partout :capture par pièges 62, capture manuelle 6 ;

G-m submorsitans : capture par pièges 26, capture manuelle 23 ;

G-longipalis : capture par pièges 3, capture manuelle 6 ;

G. fusca-fusca : capture par pièges 8,capture manuelle 0

3-1-2- La zone de la Haute Guinée

En Haute Guinée 4 espèces ont été rencontrées au cours de la campagne de prospection.1992
G.plalpalis s.i se rencontrée par tout : capture par pièges 256, capture manuelle 19 ;

G.m.submositants : presque partout : capture par pièges 88, capture manuelle 162 ;

G-longipalpis capture par pièges 21, capture manuelle 27 ;

G.tachinoides rencontrée seulement en Haute Guinée dans les préfectures de Kouroussa et de Mandiana :capture par pièges 33, capture manuelle 3

Sur un total de 601 mouches, 390 soit 64,89% ont été capturées par 1079 pièges biconiques et 85 pièges mono coniques de Va Voua.

3 -2- Résultats campagne de prospection 1993

Tableau 3 Récapitulative des glossines dans les zones de prospection 1993

Préfectures	Espèces Rencontrées	Nombre de glossines attrapées par						Total	DAP par espèces	DAP Totale
		piéges			Capture manuelle					
		M	F	Total	M	F	Total			
Siguiri	G. palpalis	20	36	56		2	2	58	0,35	
	G. tachinoides	2	4	6				6	0,036	1,3
	G.m.submorstans	20	55	75	17	27	44	119	0,23	
	G. longipalpis	49	102	151	11	13	24	175	0,70	
Dinguiraye	G. palpalis	41	84	125	3	4	7	132	0,51	
	G. tachinoides		3	3				3	0,05	1,6
	G.m.submorstans	32	39	71	9	30	39	110	0,3	
	G. longipalpis	75	107	182	8	3	11	193	0,72	
Dabola	G. palpalis	75	110	185	8	7	15	200	0,9	
	G. tachinoides		3	3		2	2	5	0,1	1,75
	G.m.submorstans	14	20	34	13	19	32	66	0,24	
	G. longipalpis	12	32	44	1	2	3	47	0,50	
Faranah	G. palpalis	61	108	169		4	4	173	0,67	
	G.m.submorstans	4	3	7	5	9	14	21	0,03	0,78
	G. longipalpis	9	12	21	8	5	13	34	0,08	
Mamou	G.palpalis	18	17	35		7	7	42	3,5	
Worékaba	G.m.submorstans	6	3	9	2	4	6	15	0,9	5,1
	G. longipalpis	1	4	4		1	4	5	0,5	
	G.fusca-fusca		2	2				2	0,2	
Total		439	744	1183	88	139	227	1410		

Tableau 4: Synthèse récapitulative des glossines campagne 1993

Espèces rencontrées	Nombre de glossines attrapées par			Pourcentage des mâles par		Pourcentages des espèces par			Densité	Pourcentage de capture par pièges
	Pièges	Capture Manuelle	Total	Pièges	Capture manuelle	Pièges	Capture manuelle	Total		
G. palpalis	570	35	605	37,71	31,42	94,21	5,79	100	5,94	94,21
G. tachinoïdes	12	2	14	16,66	0	85,71	14,29	100	0,18	85,71
G.m submorsitans	196	135	331	38,77	34,07	59,21	40,79	100	1,7	59,21
G. longipalpis	403	55	458	36,22	56,36	88,421	11,58	100	2,5	88,42
G. fusca-fusca	2	0	2	0	0	100	0	100	0,2	100
Total	1183	227	1410							

Moyenne générale de la densité = 2,18 glossines par piège par jour

3-2-1- La zone de la Haute Guinée

Au cours de la campagne d'enquête entomologique sur les glossines en 1993, il a été rencontré quatre(4) espèces dans les zones prospectées suivant les tableau ci-dessus.

G.plalpalis s.i se rencontre par tout : capture par pièges 570capture manuelle 35 ;

G.m.submositants : presque partout : capture par pièges 196, capture manuelle 135 ;

G-longipalpis capture par pièges 403, capture manuelle 55 ;

G.tachinoides rencontrée dans les préfectures de Dabola, Dinguiraye: capture par pièges 12, capture manuelle 2

Sur un total de 1410 mouches,1183 soit 83,90% ont été capturées par 1079 pièges biconiques et 275 pièges mono coniques de Va Voua.

3-2-2- La zone de la Moyenne Guinée

Dans cette région les prospections ont eu lieu seulement à Worékaba préfecture de Mamou., quatre(4) espèces ont été rencontrées au cours de la prospection.
G.plalpalis s.i se rencontre par tout : capture par pièges 35 capture manuelle 7 ;

G.m.submositants : presque partout : capture par pièges 9, capture manuelle 6 ;

G-longipalpis capture par pièges 5, capture manuelle 0 ;

G. fusca-fusca : capture par piège 2, capture manuelle 0

Sur un total de 64 mouches, 51soit 79,68% ont été capturées par 10 pièges biconiques

3– 3 – Résultats des campagnes de prospection 1995 et 1997

Tableau 5 Récapitulative des glossines dans les zones de prospection 1995 - 1997

Préfectures	Espèces Rencontrées	Nombre de glossines attrapées par						Total	DAP par espèce	D A P Totale
		Pièges			capture manuelle					
		M	F	Total	M	F	Total			
Kindia	G.palpalis	21	53	74	2	4	6	80	2,9	2,9
Télimélé	G..palpalis	115	266	381	12	18	30	411	1,3	
	G.m.submorstans	5	3	8		2	2	10	2	3,75
	G. longipalpis	1	4	5		1	1	6	0,31	
	G.fusca-fusca	3	4	7				7	0,14	
Boké	G..palpalis	57	64	121	2	4	6	127	1,67	
	G.p.gambiensé	214	345	559				559	2,25	
	G.m.submorstans	24	42	66				66	0,28	5,02
	G. longipalpis	5	7	12	3		3	15	0,57	
	G.fusca-fusca		5	5			5	5	0,25	
Boffa	G..palpalis	31	33	64	2	1	3	67	3,33	
	G.m.submorstans	2	5	7	2	1	3	10	0,43	3,9
	G.fusca-fusca		3	3				3	0,14	
Fria	G..palpalis	8	14	22		2	2	24	1,04	1,46
	G.m.submorstans	4	5	9	1	5	6	15	0,42	
Dubréka Khorira	G..palpalis	56	128	184	6	12	18	202	3,68	3,68
Total		646	981	1527	30	50	80	1607		

Tableau 6: Synthèse récapitulative des glossines 1995 – 1997

Espèces rencontrées	Nombre de Glossines attrapées par			Pourcentage des mâles par		Pourcentage espèces par			Densité	Pourcentage capture par pièges
	Pièges	Capture Manuelle	Total	Pièges	Capture manuelle	Pièges	Capture manuelle	Total		
G. .palpalis	846	65	911	38,04	38,46	92,86	7,14	100	13,99	92,86
G.p.gambiensis	559	0	559	38,08	0	100	0	100	2,25	100
G. m. submorsitans	88	11	99	39,77	27,27	88,88	11,12	100	3,56	88,88
G. longipalpis	17	4	21	35,29	75	80,95	19,05	100	0,88	80,95
G. fusca-fusca	15	0	15	20	0	100	0	100	0,14	100
Total	1527	80	1607							

Moyenne générale de la densité = 4,16 glossines par piège par jour

3-3-1 La zone de la Guinée Maritime

Les mouches rencontrées au cours des deux prospections sont par ordre d'importance :
G.palpalis si : capture par pièges 846, capture manuelle 65 ;
G-p gambiensis : capture par pièges 559 pas de capture manuelle
G-m submorsitans: capture par pièges 88 capture manuelle 11

G.longipalpis : capture par pièges 17 capture manuelle 4

G.fusca-fusca : capture par pièges 15, capture manuelle 0.

Sur un total de 1607 mouchés 1527 soit 95 ;02% des mouchés ont été capturées par (295 pièges biconiques Chalier- Laveissière et 200 pièges mono coniques Va Voua.

En 1997 les prospections ont eu lieu au CAE de Boké et dans trois (3) districts couverts par le centre. A Dubréka les opérations d'enquêtes ont été réalisées à Khorira.

Dans ces zones, nous entendons par *G. palpalis* au sens large, sans préciser qu'il s'agit de *G.p. gambiensis* au nord ou de *G.p. palpalis* au sud, car la limite entre les deux espèces n'est pas précise et nous n'avons pas faute de temps, effectué des montages pour les différencier, dans la carte ces deux sous-espèces sont représentées par leur symbole.

IV Discussion

Les enquêtes entomologiques réalisées dans les différentes zones de la Guinée ont permis de mettre en évidence la présence de 6 espèces de glossines appartenant aux 3 groupes classiquement connus sur les 9 espèces déjà identifiées en Guinée. Ces enquêtes ponctuelles ne peuvent donner qu'une idée fragmentaire des répartitions des différentes espèces et de leurs densités dans les zones d'études.

4-1 Comparaison entre les mouches riveraines et mouches savanicoles

En associant les espèces par biotope, on constate que les glossines de galeries forestières capturées par pièges représentent respectivement 61,36%, 41,27% et 87,42% du total des effectifs et encore plus 3,81%, 2,63% et 4,05% si on y ajoute les captures manuelles. Parmi les mouches riveraines G.palpalis domine de très loin G. tachinoides avec 90,50%. 97,73%. G. tahinoides est présente seulement en Haute Guinée. G.palpalis est la seule espèce riveraine rencontrée en Guinée Maritime. Chez les

mouches savanicoles, c'est G. m.submorsitans qui l'emporte sur G. longipalpis avec 83,98% et 82,5% en 1992 et 1995-1997. G. longipalpis domine G. m.submorstans avec 82,5% en Haute Guinée1993

4-2 De degré global d'infestation par les glossines

En calculant la moyenne générale de la densité pour l'ensemble de toutes les prospections effectuée par carte à 1/200.000, on obtient les valeurs assez basses bien que toutes les espèces soient additionnées. Aucune densité n'est forte sur la carte. Cela s'explique par le fait que dans presque toute la carte, il y a à côté de lieux à densités fortes ou moyennes des zones plus ou moins plus étendues, pauvres ou vides de tsé-tsé.

Ces points de concentration des mouches sont particulièrement dangereux et c'est un des intérêts majeurs de la carte au 1/200.000 de les révéler. Plus les tsé-tsé sont nombreuses plus les risques d'infection sont élevés ; la densité peut varier de façon saisonnière sans pour autant qu'il ait une corrélation avec le nombre de cas de trypanosomose. D'où l'importance de l'enquête avant toute campagne de lutte antivectorielle.

Cette étude dont les résultats figurent dans les tableaux détaillés(1, 3 et 5), tableaux synthèses(2, 4 et 6), sur la figure 1 et sur une carte provisoire de répartition des glossines. Elle a permis de connaître quelques réalités sur la répartition actuelle des glossines dans les zones prospectées en Guinée..

Il est évident qu'une prospection entomologique systématique de tout le pays permettra de connaître avec une certaine précision les différentes espèces de glossines et leurs distributions écologiques. Les résultats de ces enquêtes serviront à l'établissement d'une carte actualisée de répartition des glossines en Guinée. Ainsi sur cette base on pourrait concevoir de façon globale, les moyens à mettre en œuvre pour organiser un aménagement humain, pastoral et agricole en Guinée.

V Remerciements

Nous tenons à remercier tous ceux qui nous ont permis de réaliser les enquêtes en particulier toute l'équipe du projet, mais aussi les responsables des préfectures et les agents des services de l'élevage qui ont accepté de travailler avec nous et qui nous ont réservé le meilleur accueil

Nos remerciements vont également aux membres des différents départements et institutions qui nous ont aidé dans notre entreprise.

LA BIBLIOGRAPHIE

1 -**Chalier A. Laveissière C.** Un nouveau piège pour la capture des glossines (Gliossina Diptera, Muscidae) description et essais sur le terrain. Cah.O.R.S.T.O.M sér Ent. Méd. Parasit.. 1973 11(4) : 251 – 262.

2 -**Ford J.** Distribution of the vecteurs of african pathogenics trypanosomes Bull. Ory mond. Santé 1963-28-653-659

3 -**Ford J Katondo K.M.** the distribution of tsé-tsé flies (Glossina) in Africa. Nairobi OUA/STRC.. 1973,9 cartes à 1/500.000

4- **Potts W.H.** Distribution of tsé-tsé species in Africa. Sheet. I. : West Africa compiled ans draxn by Directorate of Coloni Surveys ; Informations collated by Potts. London 1953

5- **RICHENBACH A** Carte répartition des glossines en Afrique Occidentale d'expression française O.R.S.T.O.M Bobo-Dioulasso Centre Muraz, 1961.

6 – **VILAIN P.** De la répartition géographique des glossines en Afrique Occidentale française Bull Méd A.O.F. 1948,5,107,116

7-**Y TAZE, D CUISSANCE, M. CIAIR A. POLITZAR** Contribution à l'étude de répartition des glossines dans le Nord de la Côte D'Ivoire .Rev. Elev. Med. Vét. Pays trop, 1978,31 (3) : 329-340.

8- **M. CLAIR G. LAMARQUE** Répartition des glossines dans le Nord de la Côte d'Ivoire Rev. Elev. Med. Vét. Pays trop, 1984,37 (N° spécial) : 60-83.

9- **LA MARQUE M. CLAIR** Utilisation de la cartographie dans le cadre de l'étude sur l'infestation glossinaire dans le Nord de la Côte d'Ivoire Rev. Elev. Med. Vét. Pays trop,..1983,36 (1) : 55-60.

10 FAO 1969 Lutte et prophylaxie contre les maladies parasitaires animales. Rapport au gouvernement de la Guinée. FAO – Rome

11 D N E 1992 rapport d'activité Projet Gui /177/ C – 37 «Programme de lutte contre la trypanosomiase animale.

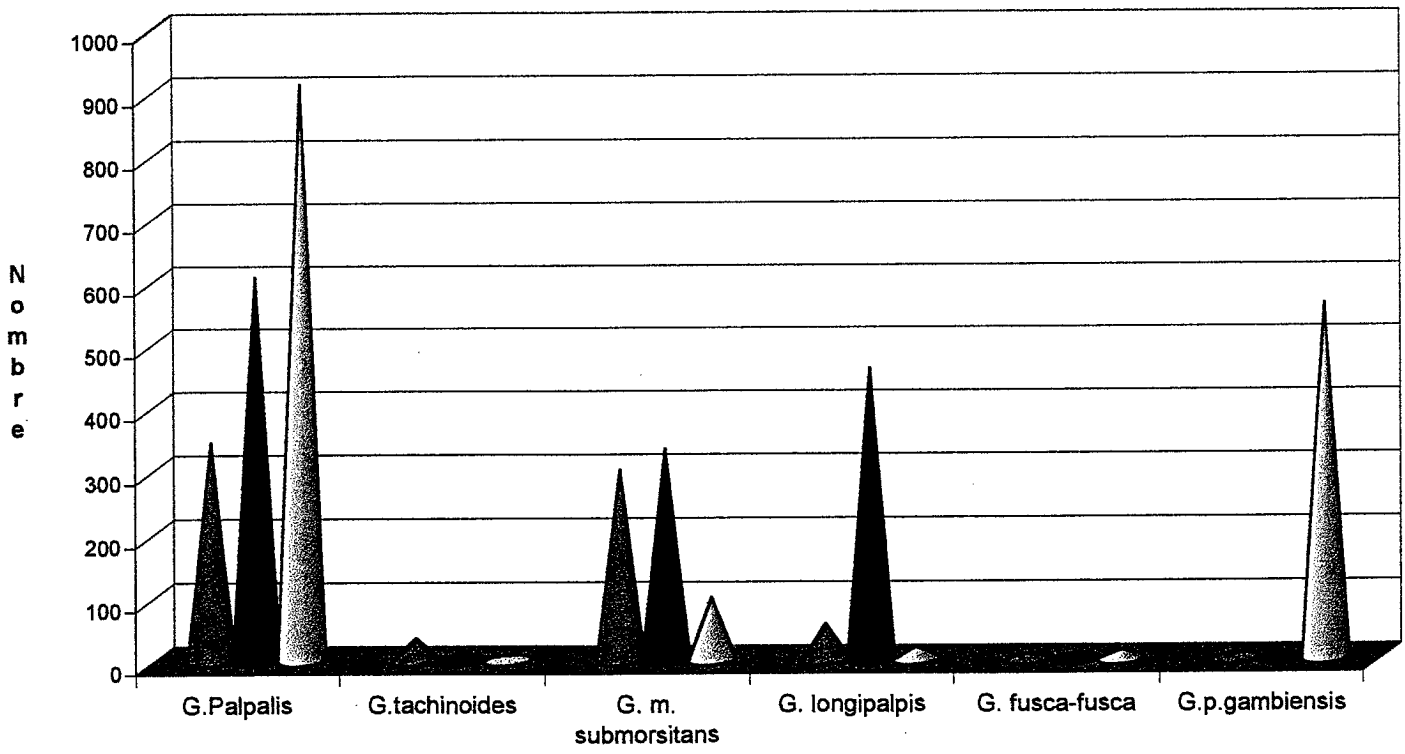
12 D N E 1993 Rapport d'activité du Projet Gui /177/ C – 37 «Programme de lutte contre la trypanosomiase animale ».

13 D N E 1993 Rapport de mission de Dr M.F. ONIKOYAMOU du Laboratoire Central Vétérinaire de Diagnostic(LCVD) au Centre d'Appui à l'Elevage (C A E) de Boké

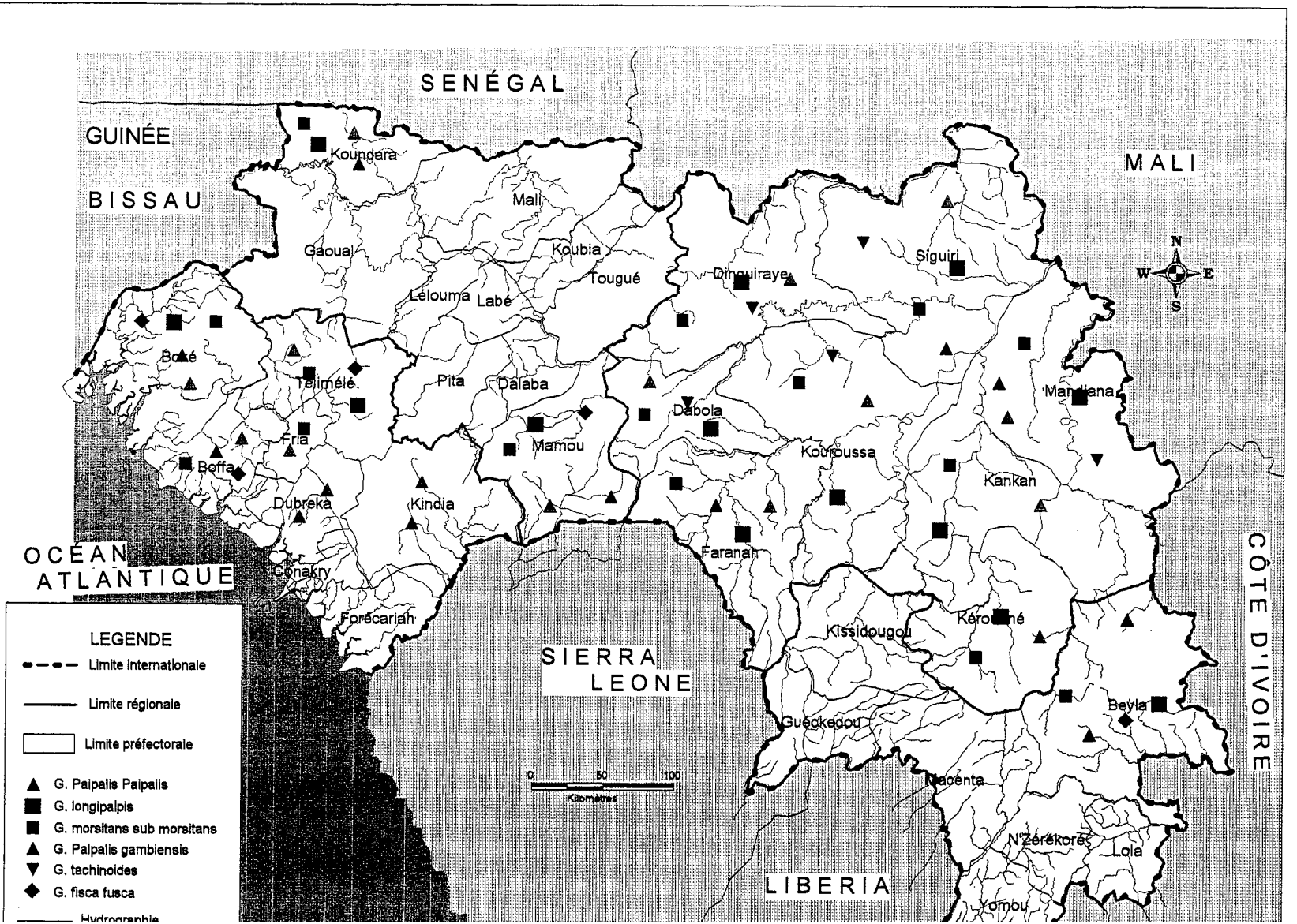
14 D N E 1995 Rapport d'activité Projet I D A / P R S E «Programme de lutte contre la trypanosomiase animale

15 D N E 1997 Rapport de mission de M. L. CEESAY du Centre International de Trypanotolérance (I T C) .Banjul Gambie

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Fig, 1 : Capture par campagne et par espèces


SENÉGAL
GUINÉE
BISSAU
MALI
Koundara
Mali
Gaoual
Koubia
Tougué
Siguiri
Dinguiraye
Lélouma
Labé
Boké
Télimélé
Pita
Dalaba
Mandiana
Dabola
Fria
Mamou
Kouroussa
Boffa
Kankan
Dubreka
Kindia
Faranah
OCÉAN
ATLANTIQUE
Conakry
Forécariah
Kissidougou
SIERRA
LEONE
Guéckedou
Beyla
Macenta
N'Zérékoré
Lola
LIBERIA
Yomou
CÔTE D'IVOIRE
N
W
E
S
0
50
100
Kilomètres
LEGENDE
Limite internationale
Limite régionale
Limite préfectorale
G. Palpalis Palpalis
G. longipalpis
G. morsitans sub morsitans
G. Palpalis gambiensis
G. tachinoides
G. fisca fusca
Hydrographie

NEW CHALLENGES FACING THE SOUTHERN AFRICA REGION IN TSETSE AND TRYPANOSOMIASIS CONTROL – A POST RTTCP PERSPECTIVE

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Abstract

While much was achieved during the fourteen years (1986 – 2000) of the RTTCP, more still remains to be done to consolidate the achievements of the project and to prevent a deterioration of the trypanosomiasis situation. Since the closure of the RTTCP, National Governments in Southern Africa have unilaterally continued to support and fund tsetse control programmes with limited or no donor support. There have been differences in the resources allocated for tsetse and trypanosomiasis control by the various National Governments depending on how important trypanosomiasis is ranked in relation to other animal diseases. While appropriate tools and strategies were developed during the RTTCP, new challenges have now emerged which require concerted action by the countries concerned as well as by International and Donor Communities. These include a) adoption by different countries of different strategies of either controlling the disease through the use of drugs or by eliminating the vector. This situation has resulted in a lack of complementarity of vector control action in neighbouring countries and hence the problem of cross border invasions b) loss of well trained and experienced personnel and the absence of training programmes to replace the lost expertise c) inadequate financial resources d) delay in the implementation of a successor programme to the RTTCP e) restricted liaison and collaboration in the planning and designing of control programmes within the region. There seems to be a shift of strategy from the regional approach towards implementation of separate operations by individual countries. There are however discussions to initiate a Regional programme to deal with the common flybelt of Botswana, Namibia, Angola and Zambia.

The current situation demands greater assistance from Global bodies such as PAAT and PATTEC through offering advice and solutions to the new challenges facing the Southern African region.

Country Report: ZIMBABWE - GIS to analyze trends in tsetse and trypanosomiasis control in Zimbabwe since 2001.

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ABSTRACT

Trypanosomosis control was achieved in most parts of Zimbabwe by the control of the vector. Control of the vector was carried out intensively or extensively using various control methods. Funding was internal and external in the last twenty years. Funding was reduced in 2001 following the completion of Regional Tsetse and Trypanosomiasis Control Programme (RTTCP). Tsetse control has largely been government funded since then. Odour-baited insecticide treated blue/black/blue targets have remained the main method of control and there currently 60000 targets deployed in 20000 km^2. Targets are deployed tactically in grid formations, along drainage lines and as a barrier along the northeastern front. Insecticide treated cattle form a wide band of control behind the area under targets. Computerisation of the mapping office has enabled a more detailed analysis to be carried. Trends in activity are presented and projected plans presented. Continued tsetse control activities have kept trypanosomosis cases at less than 10 per month in the country. Although the area reclaimed using targets has been low. However tsetse catches in infested areas have decreased by at least 50 %. In addition the Branch has successfully defended cleared areas against tsetse reinvasion using barrier of targets.
Zimbabwe has continued to carry out research in tsetse behaviour and ecology. Research on the effects of smoke as a repellent and kraal design were carried out. Studies on new dips and pour-on formulations were carried out as well as the study of the effects of insecticide treated cattle on non target species or species of ecological importance.

Epidemiological Findings on *T. evansi*

As a non-tsetse transmitted trypanosomes *T. evansi* in Sudan is almost exclusively confined to camel herds. However serum samples had been collected and examined from goats and sheep in the same zone. Although no parasitological positives were detected among these species but sero-positives using svratex were present. Indications that sheep and goats can act as reservoir are discussed.

Socio-economic effect of trypanosomiasis on pasturalist communities

A RRA was conducted in various cattle pastural groups in the Sudan, it was clear that they recognized trypanosomiasis as a serious disease which excerts a a continuous movement to avoid its vectors. The disease was ranked second to ticks and tick-borne diseases. Losses due to lowered animal production and use of trypanociadal preparations was estimated to be very high. Proposed control measures are necessary to stop the spread of *Trypanosoma* species to areas where it had not been endemic.

COUNTRY REPORT – ZAMBIA

TSETSE CONTROL IN ZAMBIA DURING THE YEARS 2001 –2003

SUMMARY

About 40% of the natural grazing area in Zambia is denied to domestic livestock due to the presence of tsetse flies and over 25% of the cattle population in Zambia are at risk of the disease. During the years under review clearly defined vector control programmes were conducted to contain the spread of tsetse flies and to protect areas of agricultural importance using an integration of technical, environmental and socially sustainable techniques with maximum community and private sector participation.

The operations during the years 2001 - 2003 concentrated mainly on consolidating existing operations in Western province, Southern province and Eastern province. Target barriers (Southern Province about 75km long and Western Province 200 Km long) were maintained during this period. The Trypanosomosis surveys carried out revealed an average infection rates of about 2% in the areas. Targets will be deployed in September 2003 in the areas were trypanosomes were detected.

In the year 2001/2002 a Social-economic study was also conducted in Choma-Kalomo block in the southern Zambia, the area which was aerial sprayed against tsetse in 1987. Seven hundred (700) house holds were interviewed for this purpose. The surveys revealed many economic benefits.

Dr. Joseph Mubanga
Zambia

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TSETSE CONTROL STRATEGY IN KENYA

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Tsetse flies are the primary vectors of Animal African Trypanosomosis (AAT) and Human African Trypanosomosis (HAT).. HAT was first recorded in Kenya in 1902 where it was restricted between Uganda and Kenya border and is now spread through out the Lake Victoria basin. A non-tsetse-transmitted trypanosomosis is a crucial constraint to the development of the rangelands. About 25% of the country is infested with 8 species of tsetse flies traversing 7 administrative provinces. The arid and semi arid lands (ASAL) occupies 80% of the land surface holding 75% of the livestock population which accounts for 90% of employment. Livestock sector supports 10% of the Gross Domestic Product (GDP). Trypanosomosis is one of the major livestock diseases that causes major economic losses through livestock /human deaths, high cost of trypanocides/ drugs, poor growth, emaciation and loss of draught/oxen power. All these effect negatively on Agricultural Production and poverty alleviation. The control of tsetse and trypanosomosis is a core function of the Veterinary Department (Ministry of Agriculture and Livestock Development) which succeeded in the control of Tsetse and Trypanosomosis since the 1940s. These achievements were not sustained due to problems that have been addressed in the new strategy paper. History of tsetse control as a public good made it difficult for farmers to adjust to the policy of cost sharing and private sector involvement in the delivery of Veterinary services. The tools available for tsetse control were either not appropriate for community participation or were of environmental concern. The future of trypanocidal drugs as an effective tool against animal trypanosomosis is not very promising due to resistance and cross-resistance. The dwindling resource allocation needs new commitments from the Government. New strategies are planned to review public policies and regulations to encourage private sector and community participation in a liberalized economy. In summary, the strategic paper sets out framework within which resources will be mobilized on a proactive and multi sectoral approach basis to create tsetse free zones. The Lambwe Valley Sterile Insect Technique (SIT) and the Farming in tsetse controlled areas (FITCA) projects are the building blocks for Pan African Tsetse and Trypanosomosis Eradication Campaign (PATTEC), the guiding vision for all tsetse and trypanosomosis control projects in the country.

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Trypanosomoses: threat to livestock-agriculture development in Ethiopia

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Abstract

Trypanosomosis is prevalent in two main regions of Ethiopia i.e. the Northwest and the Southwest regions. In the Southwest region where most trypanosomosis work has been carried out, tsetse transmitted trypanosomosis is a major constraint to the utilization of large land resources. Prior to the 60's trypanosomiasis had relatively little impact on the economy of Ethiopia. There were pockets of human sleeping sickness in the west and domestic livestock; particularly cattle could not be kept over extensive areas of the lowlands. However, much of the country is tsetse-free, either because it is north of the main African tsetse belts or because it is too high, hence too cold to support the fly. As of early 70's the significance of the disease has increased enormously and is increasing. The loss of fertility, caused by drought, overpopulation and overstocking of much land in the marginal, high temperature, low rainfall northern regions lead to the resettlement of the affected rural population and their livestock in more potentially productive areas, many of which are tsetse infested. Further more the expansion of tsetse populations into higher altitude areas, bring them into contact with previously unaffected livestock. Tsetse transmitted trypanosomosis is widely distributed in the western and southern lowlands and the river valleys cutting into the central highlands. Livestock, cattle in particular play a major role in the agricultural economy of Ethiopia. Not only do they provide meat, milk and manure, but also draught oxen are more extensively used in tsetse-free highlands of Ethiopia than anywhere else in Africa south of the Sahara. The introduction of draught oxen into the resettlement area in the lowland was severely constrained by the widespread presence of trypanosomosis. Five species of *Glossina (G. morsitans submorsitans, G. pallidipes, G. tachinoides, G. fuscipes fuscipes and G. longipennis)* have been recorded from Ethiopia but only four are widespread and significant economic importance. The most important trypanosomes, in terms of economic loss in domestic livestock are the tsetse transmitted species: *Trypanosoma congolense, T. vivax* and *T. brucei*. The closely related *T. brucei* subspecies, *T. b. rhodesiense* cause human sleeping sickness. The other trypanosoma species of economic importance are *T. evansi* of camels and *T. equiperdum* of horses. Tsetse control activities against, mainly, *G. m. submorsitans* were undertaken in about 1000 km^2 of Didessa Valley. An Eastern Africa Regional Programme "Farming in Tsetse Control Areas (FITCA)" is operating, as an extension of the previous activities, over a total area of 4,500 km^2 of the upper Didessa valley to control tsetse flies and rehabilitate mixed farming practices. Apart from this, operation is underway to eradicate tsetse flies from an area of 25,000 km^2 in the Southern Rift Valley of Ethiopia using the Sterile Insect technique (SIT). If trypanosomosis could be controlled in Ethiopia, much of the best-watered and most fertile land of southwest could be utilized. Land suitability studies carried out in areas of low population density in tsetse infested areas of the country revealed that these areas have the best potential of expanded agriculture, provided that trypanosomosis constraint can be overcome.

REGISTRATION FORM

27th MEETING OF THE INTERNATIONAL SCIENTIFIC COUNCIL FOR TRYPANOSOMIASIS RESEARCH AND CONTROL
(ISCTRC)

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I wish to present the following paper(s)

Oral:

Identification of trypanosomes by polymerase chain reaction (PCR) in *Glossina swynnertoni* Austen and *G. morsitans morsitans* Westwood in Tanzania

Summary

Prevalence of various species and subgroups of trypanosomes in infected tsetse flies from a sleeping sickness focus in Babati district was determined by the use of polymerase chain reaction (PCR) method. The predominant tsetse species found in the area were *Glossina swynnertoni* and *Glossina morsitans morsitans*. Microscopic examination of 2893 *G. swynnertoni* showed that the infection rate was 15.1% whereas for *G. m. mositans*, 5160 were examined and the infection rate was 5.21%. A total of 368 *G. swynnertoni* and 266 *G. m. morsitans* were analysed for trypanosomes identification with primer sets specific for *T. (Duttonella) vivax*, T. (*Nannomonas*) *simiae*, *T. (N) godfreyi* and *T.* (*Nannomonas*) *congolense* (Savannah and Kilifi). PCR succeeded to identify 15.05% of *G. swynnertoni* and 11.68% of *G. m. morsitans*. PCR amplification also allowed identification of mixed infections (double) by 20.9% in *G. swynnertoni* and 25% in *G. m. morsitans*. The PCR techniques failed to identify 86.91% (551/634) of the parasitologically positive flies and the reasons for this failure are discussed.

L'indication de trypanosomes pour la Reaction de Chaîne Polymerase (RCP) en *Glossina swynnertoni Austen* et *G.morsitans morsitans* Westwood en Tanzanie.

Résumé

La dominance des espèces variées et sous-groups de trypanosomes dans les mouches tsé-tsés testées à partir de la maladie du someil mise au point avec la population dense de bétail dans le district de Babati était déterminée par l'utulisation de méthode de Reaction de Chaîne Polymerase (RCP). L'espèce prédominante de tsé-tsé trouvée dans la région était *Glossina swynnertoni* et *Glossina morsitans morsitans*. L'examen microscopique de 2893 *Glossina swynnertoni* a montré que le taux d'infection était de 15.1% alors que pour *G.m.mositans*, 5160 été examinées et le taux d'infection était de 5.21%. Le total de 368 *G.swynnertoni* et 266 *G.m. morsitans* était analisé pour l'identification de trypanosomes avec les series élémtaires spécifiques pour T. (*Duttonella*) *vivax*, T. *(Nannomonas) simiae*, T. *(N) godfreyi* et T. *(Nannomonas) congolense* (Savannah et Kilifi). La RCP avait reussi pour identifier 15.05% de *G. swynnertoni* et 11.68% de *G. m.morsitans*. L'amplification de RCP avait aussi permi l'identification des infections mélangées (double) par 20.9% en *G.swynnertoni* et 25% en *G.m.morsitans*. Les techniques de la RCH ont échouées d'identifier 86.91% (551/634) des mouches paragitologiquement positives et des raisons pour cette defaite sont discutées.

Posters:

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Relationship between *Trypanosoma equiperdum, T. evansi* and *T. b. brucei* as revealed by molecular fingerprinting

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ABSTRACT

Trypanosoma equiperdum causes the disease dourine in horses while *T. evansi* and *T. b. brucei* cause surra and nagana in a broad range of hosts. In horses, clinical signs of dourine, chronic surra and chronic nagana are very similar and prohibit correct differential diagnosis. Before the start of this study, neither parasitological nor serological test could make a distinction between these three parasites. Species-specific molecular tests for all *Trypanozoon* taxa are not available and the existing molecular trypanosome detection techniques have not been validated for diagnostic purposes. In this study, we examined different stocks of *T. equiperdum*, *T. evansi* and *T. b. brucei* using PCR RoTat 1.2, Random Amplified Polymorphic DNA (RAPD) and multiplex-endonuclease genotyping approach (MEGA). The results show that most *T. equiperdum* reported strains are very similar if not identical to *T. evansi*. Only two *T. equiperdum* reported strains, in casu BoTat 1 and OVI differ from *T. evansi* but could not be distinguished from *T. brucei*. From these data, together with the lack of origin information on some of the analysed *T. equiperdum* stocks, it appears that true *T. equiperdum* is a subspecies of *T. brucei*.

Caractérisation de *Trypanosoma equiperdum*, *T. evansi* et *T. b. brucei* par empreinte moléculaire

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RESUME

Trypanosoma equiperdum est responsable de la dourine chez les chevaux alors que *T. evansi* et *T. b. Brucei* sont à l'origine respectivement de surra et nagana dans une large gamme d'hôtes. Chez les chevaux, les signes cliniques de dourine, surra et nagana chroniques sont très similaires ce qui empêche tout diagnostic différentiel avec certitude. Avant le début de cette étude, aucun test parasitologique ou sérologique ne permettait de faire la distinction entre ces trois parasites. Les tests moléculaires espèce-spécifiques pour tout le sous-genre *Trypanozoon* ne sont pas encore disponibles et les techniques moléculaires existantes de détection de trypanosomes n'ont pas été validées à des fins diagnostiques. Dans cette étude, nous avons examiné différents isolats de *T. equiperdum*, *T. evansi* et *T. b. brucei* en utilisant comme technique : la PCR du gène RoTat 1.2 et une approche RAPD (Random Amplified Polymorphic DNA) et MEGA (multiplex-endonuclease genotyping approach). Les résultats montrent que la plupart des souches de *T. equiperdum* sont très similaires ou même identiques à *T. evansi.* Seuls deux isolats de *T. equiperdum,* BoTat 1 et OVI diffèrent *de T. evansi* mais ne peuvent pas être différenciés de *T. brucei.* En l'absence d'information sur l'origine de la plupart des souches de *T. equiperdum* étudiées et en l'absence d'isolat récent, ces résultats préliminaires suggèrent que *T. equiperdum* pourrait constituer une sous-espèce de *T. brucei.*

Oral presentation

Genetic characterization of trypanosomes isolated from pigs in the sleeping sickness focus of Bonon, Côte d'Ivoire

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We investigated the role of domestic pigs as a potential reservoir host for *Trypanosoma brucei gambiense*, in the active sleeping sickness focus of Bonon in Center West Côte d'Ivoire. Since a selective effect of the isolation method has been suspected, two different methods were simultaneously used to isolate trypanosomes from pigs: KIVI (Kit for In Vitro Isolation of trypanosomes) and rodent inoculation. Using isoenzymes, two stocks isolated from a same animal showed a different pattern according to the isolation method used. Irrespective of the isolation method, all the pig stocks belonged to a new group of zymodemes different from both the classical *T. b. gambiense* group 1 and the bouaflé group, infecting human patients in this focus.

When using diagnostic primer sets for *T. b. gambiense* group 1, only trypanosome stocks isolated from pigs by KIVI showed the specific *T. b. gambiense* group 1 amplification products. All the stocks isolated by rodent inoculation showed the same banding pattern, but different from the stocks isolated by KIVI.

These PCR results confirm the selective effect of the isolation techniques and indicate the presence of *T. b. gambiense* group 1 in domestic pigs. The discrepancy between results from isoenzyme analysis and PCR technique could be related to the better sensitivity of the PCR tool.

This work also indicates that pigs could be infected by at least two different trypanosomes of *Trypanozoon* subgenus, of which *T. b. gambiense* group 1 and another still non characterized trypanosome, each being selected by the isolation method. The question about the infectivity of *T. b. gambiense* group 1 from pigs for human remains.

Presentation orale

Caracterisation génétique de trypanosomes isolés de porcs dans le foyer de maladie du sommeil de Bonon, Côte d'Ivoire

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Au cours d'une étude sur le rôle du porc domestique comme réservoir animal de *Trypanosoma brucei gambiense* groupe 1, des trypanosomes ont été isolés de porcs dans le foyer actif de maladie du sommeil de Bonon, au Centre Ouest de la Côte d'Ivoire.

Parce qu'un biais sélectif de la méthode d'isolement était suspecté, deux méthodes ont été utilisées simultanément pour cet isolement: le KIVI (Kit for In Vitro Isolation of trypanosomes) et l'inoculation aux rongeurs. En utilisant les isoenzymes, deux isolats d'un même animal présentaient un profil différent selon la méthode d'isolement utilisée. D'autre part, tous les isolats de porcs, quelque soit la méthode d'isolement, appartiennent à un nouveau groupe de zymodèmes différent de ceux du groupe 1 de *T. b. gambiense* et du groupe bouaflé identifiés chez les malades humains de ce foyer.

En utilisant des amorces PCR diagnostiques de *T. b. gambiense* groupe 1, seules les souches isolées de porcs par KIVI ont montré les produits d'amplification caractéristiques de *T. b. gambiense* groupe 1. En revanche, tous les isolats obtenus par inoculation aux rongeurs présentaient un même profil de bandes, différent de celui des isolats par KIVI.

Ces résultats de PCR confirment le biais sélectif de la méthode d'isolement et montrent la présence de *T. b. gambiense* groupe 1 chez les porcs domestiques. La différence entre les résultats obtenus par analyse des isoenzymes et par PCR peut être reliée à une plus grande sensibilité de la PCR.

Ce travail indique aussi que les porcs pourraient être infectés par au moins deux génotypes de *Trypanozoon* différents, dont *T. b. gambiense* groupe 1 et un autre trypanosome non encore carcatérisé, chacun d'eux étant sélectionné par la méthode d'isolement. La question demeure cependant en ce qui concerne l'infectivité pour l'homme, de *T. b. gambiense* groupe 1 isolé du porc.

MATING RATIOS IN TSETSE SPECIES - MECHTILDA B BYAMUNGU TANZANIA

Awaité d

Identification of vertebrate blood meals in tsetse flies

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Summary

It has been suggested that wild animals could act as reservoir hosts for *Trypanosoma brucei gambiense*. Here we studied feeding preferences of tsetse flies in order to estimate the amount of blood meals taken by these vectors from wildlife.

Tsetse flies were captured in three localities in southern Cameroon (Bipindi, Campo and Nditam) and blood meals were collected. Identification of blood meals were performed by cytochrome B heteroduplex analysis : blood meals DNA and animal reference DNA were amplified using cytochrome B gene primers and hybridized with Giant rat DNA chosen as driver. Blood meals origin were identified by comparing heteroduplex DNA profiles with those of reference DNA.
3080 tsetse flies were captured and 96 blood meals were collected from 77 (80%) *Glossina palpalis palpalis*, 16 (17%) from *G. pallicera*, 2 (2%) from *G. calliginea* and 1 (1%) from *G. nigrofusca*. 40 blood meals have been taken from human, 17 (18%) from pigs, 14 (14%) from sitatunga and 1 (1%) from sheep. 17 blood meals remained unidentified as they did not come nor from domestic or from wild animals with provided DNA samples. 7 blood meals could not be amplified.

G. palpalis feeds on human, domestic and wild animals and at least 18% of blood meals were taken on wildlife.

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Identification de l'origine des repas de sang de vertébrés chez les glossines

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Résumé

La faune sauvage est suspectée de jouer le rôle de réservoir de *Trypanosoma brucei gambiense*. Une étude des préférences trophiques des glossines a été menée pour estimer l'importance des repas de sang pris sur cette faune sauvage.

Pour ce faire, une capture des glossines a été organisée dans trois localités du sud Cameroun (Bipindi, Campo et Nditam) et des repas de sang ont été collectés. L'origine des repas de sang a été déterminée par la technique des hétéroduplex du gène du cytochrome B : l'ADN de référence de ces vertébrés sauvages et l'ADN extrait des repas de sang ont alors été amplifiés par les amorces du gène du cyrochrome B et hybridés avec l'ADN du rat de Gambie choisie comme "driver"; les homoduplexes et hétéroduplexes formés ont été séparés sur gel de polyacrylamide. L'origine des repas de sang a été déterminée par comparaison des profils hétéroduplexes des échantillons avec ceux des ADN de référence.

3080 glossines ont été capturés et 96 repas de sang ont été collectés dont 77 (80%) provenaient de *Glossina palpalis palpalis*, 16 (17%) de *G. pallicera*, 2 (2%) de *G. calliginea* et 1 (1%) de *G. nigrofusca*. 40 (42%) repas de sang ont été pris sur homme, 17 (18%) sur porc, 14 (14%) sur Guib d'eau (sitatunga) et 1 (1%) sur mouton. 17 repas de sang n'ont pas pu être identifiés car ne correspondant à aucun animal domestique ni aux animaux sauvages dont nous disposions d'ADN de référence. 7 repas de sang n'ont pas pu être amplifiés.

G. p. palpalis se nourrit sur homme, animal domestique et animal sauvage et au moins 18 % de repas sont pris sur les animaux sauvages.

Présentation orale

E / F

Différenciation génétique des populations naturelles de *Glossina palpalis s.l.* grâce aux microsatellites : artéfacts, dèmes, ou espèces jumelles?

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A travers l'initiative PATTEC, les pays Africains ont pour l'objectif l'éradication des trypanosomoses et des mouches tsé-tsé. Une méthode serait la technique du « mâle stérile » (SIT), qui suppose une connaissance précise de la génétique des populations des espèces cibles. Nous présentons une revue des travaux menés sur les deux sous-espèces de *Glossina palpalis* à des échelles géographiques variées, grâce à l'ADN microsatellite.

Chez *G.p. gambiensis*, deux loci montrent des différences importantes entre les glossines du Sénégal et du Burkina Faso. Les glossines du Sénégal sont aussi plus petites que celles du Burkina Faso (taille des ailes). Plusieurs dèmes sont mis en évidence, avec des conditions écologiques spécifiques à chacun.

A l'échelle de la zone de Sidéradougou, au Burkina Faso, une structuration de population est trouvée entre des glossines éloignées de quinze kilomètres ($Fst=0,04$, $p<0,001$). Des différences dans le taux d'infection et l' identité des trypanosomes sont trouvées chez ces deux groupes de tsé-tsé. De plus, à l'ouest de la zone, une analyse factorielle des correspondances (AFC) permet de distinguer 2 ensembles génétiquement distincts, qui refléteraient le mélange en ce point de populations génétiques (ou espèces ?) de *G.p. gambiensis* originaires de 2 bassins versants différents : le bassin de la Comoé, et celui du Mouhoun (Volta Noire).

Dans le foyer de THA de Bonon, (Centre Ouest Côte d'Ivoire), *G.p.palpalis* a été étudiée grâce à 5 loci microsatellites. De très forts déficits d'hétérozygotes ont été mis en évidence au sein de la population totale (*Fis* moyen = 0,366, $p<0,001$), à chacun des 5 loci. Des allèles nuls sont identifiés à 2 loci. Une AFC permet de montrer la coexistence, au sein des mêmes pièges, de deux ou plusieurs groupes génétiquement distincts.

Ces résultats suggèrent que, au sein de « l'espèce » *Glossina palpalis*, la présence d'espèces jumelles ne peut pas être exclue. Les implications en terme de lutte génétique pourraient être importantes.

Oral communication

Genetic differentiation in natural populations of *Glossina palpalis s.l.* using microsatellite DNA polymorphism : artifacts, demes or cryptic species?.

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Through the PATTEC initiative, African countries have the aim of eradicating tsetse. One of the main method to fight agains the tsetse could be the Sterile Insect Technique (SIT), which implies a thorough knowledge of population genetics of targeted species. Here is reviewed the work conducted at various spatial scales in West Africa using microsatellite DNA polymorhism on both subspecies of *Glossina palpalis*.

Two microsatellite loci showed significative differences between West African populations. Differences were also found in the size of the wings, tsetse from Senegal appearing significantly smaller than those from Burkina Faso. At this scale, different demes were revealed, with different ecological conditions specific to each deme.

At the scale of an agropastoral area in South West Burkina Faso, population structuring appeared between tsetse distant from about fifteen kilometers (Fst=0,04, p<0,001). Different infection rates and different trypanosomes species were found in these tsetse. In addition, in the western part of the area, A Factorial Correspondence Analysis (FCA) allowed to distinguish two genetically distinct groups. This might reflect the junction, at this point, of two different populations (species?) of *G. palpalis gambiensis* originating from different river basins, the basin of Comoé river, and the basin of the Mouhoun (Volta Noire).

In the sleeping sickness focus of Bonon (Center West Côte d'Ivoire), five microsatellite loci have been used on *G. p. palpalis*. Huge heterozygote deficiencies were found in the whole sample (Fis over loci=0,366, p<0,001). Null alleles were identified at two loci. The FCA also showed that genetically distinct groups coexisted within traps.

All these results suggest that in *Glossina palpalis* sensu lato, the existence of sympatric cryptic species cannot be excluded. There is a need for more extensive studies, the presence of this phenomenon having great potential implications on tsetse control by genetic methods.

 2) Listed 304

Survival of starved adult *Glossina* after exposure for several hours to low temperature

E F

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Tsetse flies are relatively sensitive to the low temperatures that would be required for aerial release systems, as they have been developed for other species. In many insect species it is known that a cold or heat shock can induce protein synthesis for subsequent protection to exposure to low temperatures. In order to see if this approach would be useful for tsetse in relation to an aerial release system a series of experiments has been undertaken. Male *Glossina pallidipes* and *G. fuscipes* that had been fed at least two blood meals were cold shocked for 30 minutes or one hour then returned to normal colony holding conditions for one hour prior to chilling for six hours at 4°C. In another series of observations the male flies were chilled at 4°C for six or twenty-four hours with gradual decrease and increase of temperature at start and end of chilling respectively. Humidity was kept at 40% or 70% for the duration of low temperature exposure. The flies were then returned to normal colony holding conditions to observe survival without feeding as an indicator of energy reserves. When the flies were removed from the chilling chamber the majority of the survivors regained full mobility in the holding cages within five to thirty minutes. Mortality was initially recorded on the morning after return to normal colony conditions. Mortality was variable about eighteen hours (overnight) after removal from low temperature for both *G.pallidipes* and *G.fuscipes*. Most of the flies died within fourteen days with a few surviving longer with 50% mortality between six and eight nine days after chilling. The mortality trend was similar for all treatments and no improvement could be seen following cold shock. The trend was similar at 40% and 70% humidity.

Résumé pour la réunion du CSIRLT à Pretoria

Survie à jeun d'adultes de *Glossina* après exposition de plusieurs heures à basse température

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Les mouches tsé-tsé sont relativement sensibles aux basses températures requises pour l'utilisation de systèmes de lâcher aériens développés pour d'autres insectes ravageurs. Il a été démontré, pour de nombreuses espèces d'insectes, qu'un choc thermique (à haute ou basse température) pouvait induire la synthèse de protéines protégeant l'insecte en cas de nouvelles expositions à des conditions similaires de température. Une série d'expériences a été menée afin de vérifier si cette approche pouvait être validée dans le cas des mouches tsé-tsé. Deux traitements ont étés testés avec *Glossina pallidipes* et *G. fuscipes*. Dans le premier cas, les adultes mâles des deux espèces, ayant préalablement eu deux repas de sang, furent soumis à de basses températures durant trente minutes. Dans le deuxième traitement, les adultes mâles, après le même type de repas, furent soumis aux basses températures durant une heure, puis retournés en conditions de température d'élevage pour une heure avant d'être maintenus à +4°C durant six heures. Dans une autre série d'observations, les adultes mâles furent maintenus à +4°C durant six ou 24 heures, mais avec une diminution et une augmentation graduelle de la température en début et en fin d'expérimentation. L'humidité fut maintenue à 40 ou 70% durant les périodes d'exposition aux basses températures. Après le traitement respectif, les insectes furent replacés en conditions d'élevage standard afin d'observer leur capacité de survie sans nourriture, indicatrice de leurs réserves d'énergie. La majorité des insectes survivants après le passage au froid recouvrèrent entièrement leur mobilité entre cinq et 30 minutes suivant leur sortie de la chambre froide. Les premiers décès furent enregistrés durant la matinée suivant le retour des insectes en conditions d'élevage standard. Un taux de mortalité variable fut enregistré dans les 18 heures suivant le passage au froid pour les deux espèces testées. La plupart des insectes moururent durant les 14 jours suivant le passage au froid (50% de mortalité entre le sixième et le neuvième jour). Aucune différence significative

Abstract for ISCTRC meeting in Pretoria, 2003

Tsetse fly quality assessment using a walk-in field cage

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Abstract

The release of good quality flies in a Sterile Insect Technique field programme requires the development of suitable quality control procedures. To improve behavioural quality control systems currently in use, an investigation on the possibility of using a large walk-in cage for mating behaviour studies as well as other quality control procedures associated with tsetse mass rearing was carried out. Adult, sexually mature virgin female and male tsetse flies were released in a field cage and general behaviour was observed for at least two continuous hours in the morning. Adult males were chilled at 4°C for varying periods and/or exposed to sterilising irradiation prior to the test. Following release most flies flew and landed on the walls of the cage as well as on the trees. The flies tended to rest and preen themselves during most of the observation period with occasional short flights across the cage. In some instances mating 'strikes' immediately followed release of the flies but in general flies flew to, and remained in, one position before attempting to mate. Females and males were observed in close proximity for long periods without any attempts to engage in mating activity. The types of male, number of mating pairs, time at start and end of copulation, and presence or absence of sperm in spermatheca were recorded. These parameters were used in calculation of performance indices. The use of field cages under "near-natural" conditions for assessing sterile fly quality and other mating characteristics can be invaluable in the development of meaningful quality control protocols.

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Résumé pour la réunion du CSIRLT à Prétoria, 2003

Evaluation en cage de terrain de la qualité des mouches tsé-tsé d'élevage

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Résumé

Le lâcher d'insectes dans le cadre d'un programme utilisant la technique de l'insecte stérile requiert le développement de procédures de contrôle de la qualité. Afin d'améliorer les procédures existantes de contrôle de la qualité comportementale des insectes, les possibilités d'utilisation des cages de terrain pour l'étude du comportement sexuel, ainsi que celles d'autres procédures en relation avec l'élevage de masse ont été étudiées. Dans le cadre de ces recherches, le comportement de mouches tsé-tsé adultes (sexuellement matures et vierges) en cage de terrain a été observé, durant un minimum de deux heures consécutives dans la première moitié du jour. Les mouches adultes mâles étaient réfrigérées pour des durées variables et / ou étaient exposées à des doses de radiation stérilisantes avant que le test ne soit effectué. Immédiatement après avoir été lâchées, la plupart des mouches s'envolaient et se posaient sur les parois de la cage, ainsi que sur les arbres. Durant la majeure partie de la période d'observation les mouches restaient immobiles effectuant occasionnellement de cours vols. Dans certains cas, des tentatives d'accouplement suivirent immédiatement le lâcher des insectes. Des mâles et des femelles ont été observés pendant de longues périodes à proximité l'un de l'autre, sans aucune tentative d'accouplement. Le type de mâle, le nombre d'accouplement, la durée de l'accouplement, ainsi que la présence ou l'absence de sperme à l'intérieur des spermathèques ont été enregistrés. Ces paramètres furent utilisés pour les calculs des indices de performance.

En conclusion l'utilisation des cages de terrains en condition semi-naturelles pour l'évaluation de la qualité sexuelle et comportementale des insectes stériles est déterminante pour le développement de protocoles de contrôles de qualité.

Abstract for ISCTRC meeting in Pretoria, 2003.

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DIET FOR TSETSE MASS REARING

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Provision of diet for tsetse mass rearing is one of the most critical components of the Sterile Insect Technique. Blood is readily available as a by-product from abattoirs, but there are problems with cleanliness and storage. The ideal diet would be a dry product, shelf storable at ambient conditions in the tropics. Research and development work at the Agency's Laboratories Seibersdorf has concentrated on the processing of blood to reduce bacterial contamination and to extend storage time, identification of critical diet components, and development of defined and semi-defined diets.

NOURRITURE ARTIFICIELLE POUR L'ELEVAGE DE MASSE DES MOUCHES TSE-TSE

La disponibilité de quantité suffisante de nourriture artificielle est une des composantes les plus critiques de l'utilisation de la technique de l'insecte stérile contre les mouches tsé-tsé. Bien que le sang soit disponible en tant que sous-produit des abattoirs, des problèmes se posent concernant sa propreté ainsi que les conditions de stockage. La nourriture artificielle idéale devrait être un produit déshydraté et pouvant être stocké aisément dans les conditions environnementales des zones tropicales. Les travaux de recherche et développement des laboratoires de l'AIEA à Seibersdorf ont été concentrés sur le traitement du sang en vue de réduire la contamination bactérienne et d'accroître la durée de stockage, ainsi que sur l'identification des composants critiques pour la nutrition des adultes et le développement de nourriture artificielle pour laquelle tout ou partie des composants est identifiée et quantifiée.

Automated Mass Rearing and Molecular Genetic Studies of *Glossina fuscipes fuscipes* at LIRI, Uganda

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Abstract

As part of the "Improved Quality Control for Expanded Tsetse Production Project" several quality control parameters and stadardised reporting procedures on pupal weights, emergence rates, adult survival and sex ratio have been developed for use in tsetse rearing at LIRI [and other participating insectaries in Africa. At LIRI, the colony of *Glossina fuscipes fuscipes* (derived from Central African Republic -CAR from 1998) has been successfully established in the insectaries at LIRI to support the Area-wide Tsetse Eradication PATTEC-Uganda project for the Lake Victoria Basin.
Tsetseflies standing at over 8,000 fertilised females have adapted to the *in-vitro* [membrane] feeding system on fresh frozen bovine blood and the automated self-stocking of production cages was successfully introduced into LIRI insectaries in 2002. The fecundity has been reasonable ranging from 0.23 to 0.78 pupae/female/10 days with an average weight of 29mg, good emergence rates up to 96% and low daily mortality (beolw 1%) and the average fly longevity is about 10 weeks.
Studies have also been started on molecular genetics of the *G. f. fuscipes* strains within Uganda and between the Uganda and the CAR strain to assess gene flow, compatibility, and competence. Mating experiments are being set up and PCR and Agarose gels are being used to analyse DNA. Results will be reported.

Poster

Just a reminder

Oral ??

AFLP and microsatellite analysis of *Glossina pallidipes* Austen populations in Kenya

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Abstract

Trypanosomosis transmitted by tsetse flies is a key impediment to economic growth in more than half of rangelands in Kenya. Of the eight species of tsetse flies that are recognized in Kenya, Glossina pallidipes is considered the most important. Its distribution is discontinuous, not found above altitudes of 2000 meters and its associated with the presence of suitable habitats for land use. Even on a very small geographical scale (within a few squire km), allopatric populations may exist, breeding very independently. AFLP and microsatellite analysis among the populations revealed genetic polymorphism. The samples of tsetse were obtained from 4 geographical zones namely, Narok, Bondo, Nguruman and Lambwe Valley. AFLP analysis showed some allelic frequencies among distant populations as well as populations sampled from different sites of the same area. In two neighboring populations in Bondo district, the population in Rambira showed an amplified locus of about 290 base pairs which was missing in flies from Lambugu. Lambwe Valley and Nguruman populations had 6 similar loci amplified, apart from an additional 1050 base pair allele only amplified for the Nguruman population. Moreover, apart from an 830 base pair allelic form amplified from the Lambwe Valley populations, all the loci amplified were similar to those of a strain reared at KETRI. This accounted for 86% homology. In addition, a 70% homology among Narok and Lambwe Valley populations was revealed. Some alleles (830 base pair, 780 base pair and 290 base pair) identified for Lambwe Valley populations were missing from the Narok populations. Characteristic allelic forms specific to each tsetse population and not others could act as epidemiological markers for these populations. Three alleles measuring 470, 500 and 795 base pair were identified as possible markers for the Glossina pallidipes populations. The three appeared for all the populations sampled. Moreover, those with higher chances of sexual compatibility would easily be identified by use of such markers. This would improve tsetse rearing for the SIT initiatives. Four alleles were identified for a single locus microsatellite marker, CAG 133.

Keywords: *Glossina pallidipes*, AFLP, microsatellite markers, alleles, locus, genetic polymorphism

The performance of a colony of *Glossina pallidipes* under different feeding and mating regimes

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In an effort to rear large numbers of tsetse flies for Sterile Insect Technique programs, a colony of *Glossina pallidipes* (Uganda strain) was initiated at the Kenya Trypanosomiasis Research Institute (KETRI) in mid 2000 using pupae obtained from the International Atomic Energy Agency Seibersdorf laboratory, Austria. The colony was maintained through membrane feeding on frozen bovine blood on a 5 days feeding regime. Six day old females were mated with 10 day old males in the ratio of 1:1 and separated after three days. The holding rooms were maintained at temperatures of 23±2 °C, relative humidity of 70±5% and a photoperiod of 12 hrs darkness and 12 hrs light. The colony experienced high mortalities (>4% daily) and low fecundity (<0.6) until August 2002. More than 90% of the mortality was due to blood mortality. However, from September 2002, the colony was subjected to alternate-day feeding (3 days in a week) and day zero mating regimens, with resident males (10 days old) in a ratio of 1:4 in favor of females (zero day old). These changes resulted in reduced fly handling and the colony started showing improvement, with reduced mortality and improved fecundity. During the period up to February 2003 the fecundity ranged between 0.4-0.9 and daily mortality between 0.3-2.5%. Some of these figures are within those of a viable colony, which should have a fecundity of 0.7 or above and daily mortality of 1% or below. The number of producing females went up from 4500 in September 2002 to 12,000 by February 2003. The results show that the colony performed better when subjected to alternate-day feeding regime and day zero mating regimen with resident males than the previous regime. The colony size is expected to double after six months, and have more than 40,000 producing females by December 2003.

Key words: *Glossina pallidipes*, mating regime, mortality, fecundity

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Oral/Poster depend 1-5 Pae

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Same as 307 of LIRI.

Glossina pallidipes Distribution Belt in South-East Uganda is not limited to the Kenya-Uganda border.

*Okedi, L. M. A., Sekitto, C., Abila, P., Magona, J., Walubengo, J., *Obayi, C., and **Gidudu, A.*

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ABSTRACT

The geo-referenced mapping of *G. pallidipes* distribution belt, in six districts of S. E. Uganda shows that many grids with *G. pallidipes* infestation also have more *T. congolense* and *T. brucei* infections in cattle. The re-description of distribution belt in the FITCA area has continued to provide baseline data and train district Entomologists and allied tsetse control extension staff to implement appropriate tsetse control, rural development and land-use practices to promote modernization of livestock farming where two tsetse species co-exist. Activities in over 200 grids in the districts of Mbale, Tororo, Busia, Bugiri, Iganga and Kamuli have continued to show that *G. pallidipes* pockets are scattered and unlimited, but with FTDs below 10. Within SE Uganda, while the *G. pallidipes* foci traverses *G. f. fuscipes* belt, detection methods have been more focussed towards the later. It has also now been confirmed that the *G. pallidipes* distribution belt is not restricted to the Kenya-Uganda border as previously assumed especially during the last quarter of the last century when a sleeping sickness epidemic had once again ripped SE Uganda.

We report under-estimation of the *G. pallidipes*, a major vector of animal trypanosomosis as confirmed by veterinary surveys and geo-referenced mapping.

Strategies for tsetse control of these two co-existing tsetse species should focus on training various stakeholders on integrated tsetse management approaches and other options, with insecticide-impregnated odor-baited tsetse fly traps and live-bait pesticide formulations.

401 OVERVIEW OF RESEARCH ACTIVITIES ON AFRICAN TRYPANOSOMIASIS IN TDR/WHO - DR. DEBORAH KIOY (Paper Awaited) - SWITZERLAND

27TH MEETING OF THE INTERNATIONAL SCIENTIFIC COUNCIL FOR TRYPANOSOMIASIS RESEARCH AND CONTROL (ISCTRC)

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I wish to present the following paper.

NIGERIA (E+F)

ORAL PRESENTATION

CURRENT SITUATION IN THE ABRAKA SLEEPING SICKNESS FOCUS (ASSF), NIGERIA

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ABSTRACT

TITLE: Current situation in the Abraka Sleeping Sickness Focus (ASSF) focus NIGERIA

Objective

This is a WHO/CDS sponsored project, conducted to screen the population of the villages at the risk, treat diagnosed cases and establish a sustainable diagnosis and treatment center in the Abraka area of Nigeria

Methodology

Seven endemic villages, with a population of thirteen thousand, six hundred and eighty three, were studied during this first phase of the project.
Questionnaires were administered following informed consent from the participants to assess knowledge and beliefs about the disease.
CATT screening was performed using whole blood and seropositive subjects were screened microscopically, for the demonstration of trypanosomes. Lymph nodes were also surgically removed, at the Baptist Medical Center (BMC) Eku

METHODOLOGIE

Sept villages epidemiques avec une population de treize mille six cent quatre vingt trois avaient ete etudies durant la premiere phase du projet .
Les questionnaires etaient administres suivant le consentiment des participants informes pour evaluer les connaissances et les croyances au sujet de la maladie .
CATT utilisaient le sang entier et les sujets a serologie positive etaient depistes microscopiquement pour visualiser les trypanosomes . Les ganglions etaient enleves chirurgicalement au Centre Medical Baptist (BMC) EKU pour la microscopie . Les cas confirmes parasitologiquement sont traites a BMC EKU avec les medicaments fournis par l'OMS\CDS GENEVE . Les sujets serologie positive et sans parasitemie sont maintenant sur le ASSF du programme Nigerian pour le suivi des cas de la maladie du sommeil a BMC EKU .

RESULTATS

Des 13 683 sujets qui vivent dans les sept villages surveilles , seulement 2 437 (17, 8 %) ont accepte d'etre interroges .
Parmi eux , 1568 (64,3 %) sont d'accord pour etre depistes serologiquement .
183 (11,7 %) etaient serologiquement positifs , 6 (0,4 %) etaient parasitologiquement confirmes sur le champ ; en plus , 7 (0,44 %) sur l' ASST Nigeria suivent le programme qui a ete confirme a BMC EKU , ce qui ramene a 13 (0, 8 %) le nombre qui a ete traite .
42 (2,7 %) se sont retires de l'etude , bien que 128 (8,2 %) soient encore suivis.Cinq cent vingt (21,3%) des 2437 sujets interroges disent qu'ils ont entendu parler de la maladie pendant que seulement 316 (12,9 %) avaient une connaissance correcte de la maladie, 420 (17,2 %) croient que la maladie peut etre controle , bien que 593 (24,3 %) croient que la maladie peut etre traitee .

CONCLUSION

La conclusion de cette forme d'etude evolutive fondamentale pour le suivi de la recherche sur la trypanosomiase dans la zone et aussi fournie les elements de base necessaires pour le contrôle a ASST du NIGERIA pour la tsetse et la trypanosomiase .
Cette approche montrera un niveau acceptable de la suppression effective de la maladie avec la participation et la cooperation des communautes affectees dans la zone .
Bien qu'il y ait une legere amelioration de la prise de conscience a la suite de la campagne menee pendant cette enquete , les gens avec la maladie vivent dans la peur , l'incertitude et l'ostracisme .
Le resultat de cette etude est discute , les problemes associes a la recherche sur la maladie du sommeil dans la zone sont presentes .

27 eme RENCONTRE DU CONSEIL SCIENTIFIQUE INTERNATIONAL SUR LA RECHERCHE ET LE CONTROLE DE LA TRYPANOSOMIASE (ISCTRC)

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Je souhaite presenter l'expose suivant :

PRESENTATION ORALE

SITUATION ACTUELLE A ABRAKA AU CENTRE DE LA MALADIE DU SOMMEIL (ASSF) , NIGERIA .

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RESUME

TITRE : Situation actuelle a ABRAKA au Centre de la Maladie du Sommeil . (ASSF) Centre NIGERIA .

OBJECTIFS

Ceci est un projet parraine et conduit par l'OMS\CDS sur le depistage de la population des villages a risque , qui considere les cas diagnostiques et etabli des centres de diagnostic et de traitement soutenables dans la zone de ABRAKA au NIGERIA .

METHODOLOGIE

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Bien qu'il y ait une legere amelioration de la prise de conscience a la suite de la campagne menee pendant cette enquete , les gens avec la maladie vivent dans la peur , l'incertitude et l'ostracisme .
Le resultat de cette etude est discute , les problemes associes a la recherche sur la maladie du sommeil dans la zone sont presentes .

Characterization of a new genetic group of *Trypanosoma brucei s. l.* infecting asymptomatic sleeping sickness patients in Côte d'Ivoire

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Abstract

At the end of a Human African Trypanosomosis (HAT) control program carried out in 1995 and 1996 in the focus of Sinfra in Côte d'Ivoire, 63 patients remained untreated. From 1997 to 1999, a follow-up of these patients was carried out in order to convince them to be cured. However, 19 patients still remained untreated at the end of the follow-up in 1999. Different patterns of HAT clinical forms were observed: gambian classical chronic form, strongly chronic form and acute « rhodesiense-like » form. Three years later (2002), six still untreated and asymptomatic patients were still living in the Sinfra area and were examined once more. While 5 out of the 6 patients were still serologically positives, no trypanosomes could be found in any of them by the classical parasitological methods of diagnosis. However, *Trypanosoma brucei* s. l. DNA was detected by PCR in the blood of all of them, confirming a

lack of sensitivity of the parasitological tests used. The extracted DNA were studied by various recent identification techniques using satellite, minisatellite and microsatellite markers. Results showed that trypanosomes circulating in these asymptomatic patients seem to constitute a new genetic entity, different from the classical *T. b. gambiense* group 1 and bouafle group. The epidemiological consequences of the existence of such a new group are discussed here, including the concept of the individual susceptibility to the disease (human trypanotolerance).

Caractérisation d'un nouveau groupe génétique de *Trypanosoma brucei* s. l. circulant chez des patients asymptomatiques atteints de la maladie du sommeil en Côte d'Ivoire

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Résumé

A la fin d'un programme de lutte contre la Trypanosomose Humaine Africaine (THA) mené en 1995 et 1996 dans le foyer de Sinfra en Côte d'Ivoire, 63 patients étaient toujours non-traités. Entre 1997 et 1999, ces patients ont été suivis dans le but de les convaincre de se rendre dans un centre de traitement. Cependant, 19 patients n'étaient toujours pas traités à la fin du suivi en 1999. Différentes évolutions cliniques de THA ont été observées : des formes chroniques classiques dites gambiennes, des formes asymptomatiques, et des formes aiguës dites « rhodesiense-like ». Trois ans après, en 2002, six patients asymptomatiques non-traités et toujours présents dans le foyer de Sinfra ont été revus. Même si 5 de ces 6 patients étaient toujours séropositifs, aucun trypanosome n'a pu être mis en évidence chez ces personnes par les méthodes classiques de diagnostic parasitologique. Cependant, de l'ADN de *Trypanosoma*

brucei s. l. a été détecté par PCR confirmant le manque de sensibilité des tests parasitologiques. Nous avons identifié les extraits d'ADN à l'aide de plusieurs marqueurs utilisant des séquences satellites, minisatellites et microsatellites. Les résultats ont montré que les trypanosomes circulant chez ces patients asymptomatiques semblent constituer une nouvelle entité génétique différente du classique groupe 1 de *T. b. gambiense* et du groupe « bouaflé ». Les conséquences épidémiologiques de ce résultat sont discutées dans cette communication, en incluant le concept de la susceptibilité individuelle à la maladie (trypanotolérance humaine).

Prédisposition génétique à la Trypanosomose Humaine Africaine (THA): Associations de polymorphismes du promoteur des gènes codant pour le TNF-α et l'IL-10 avec la maladie

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Bien que l'importance des facteurs environnementaux et comportementaux dans l'épidémiologie de la THA aient été démontrés, il semble exister une susceptibilité individuelle à la maladie. L'existence de ce phénomène et son fondement génétique ont été démontré sur des modèles expérimentaux. Des arguments indirects sont en faveur de celui-ci chez l'homme.

L'étude de la susceptibilité génétique chez l'homme a été rendue possible par le développement de méthodes épidémiologiques et génétiques. Parmi elles, les analyses d'association étudient le rôle de polymorphismes de l'ADN dans le déterminisme de l'infection. Ces analyses comparent la fréquence de polymorphismes de gènes potentiellement impliqués dans la maladie entre des malades et des témoins, après ajustements sur les facteurs de risques environnementaux et/ou comportementaux. Ces méthodes ont permis la confirmation d'une susceptibilité génétique pour des maladies parasitaires comme le paludisme et la bilharziose.

L'objectif de notre travail était d'étudier le rôle de polymorphismes des gènes codant pour l'IL-10, l'IL-4, l'IL-2 et le TNF-α dans le contrôle de la THA. Ces cytokines jouent un rôle important dans la réponse immune à cette maladie. Deux études d'associations complémentaires ont été réalisées : une étude Cas Témoins Classique et une étude basée sur le Test de Déséquilibre de Transmission permettant la prise en compte des biais de comparabilité. Les marqueurs génétiques utilisés sont des polymorphismes nucléotidiques simples (SNPs).

Les résultats ont montré deux associations significatives avec la maladie. La première concerne une mutation en position -308 sur le promoteur du gène du TNF-α. Les sujets homozygotes pour cette mutation sont prédisposés à la THA. La seconde intéresse une mutation en position -592 sur le promoteur du gène de l'IL-10. Dans ce cas les porteurs de la mutation à l'état homozygote ou hétérozygote ont également un risque significativement plus élevé de développer la maladie. Ces résultats confirment le rôle important de ces cytokines et du contrôle génétique de leur régulation dans la THA.

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Genetic predisposition to Human African Trypanosomosis (HAT): polymorphisms of TNF-α and IL-10 genes promoters are associated with the disease

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Despite the importance of behavioural and environmental risk factors there are some arguments, in both animal models and human studies, consistent with the existence of an individual susceptibility to the HAT.

In humans, the available means to identify the role of genetic factors in the expression of complex diseases combine epidemiological data (behavioural and environmental risk factors) and genetic information.

Among them, association studies are interested in the distribution of a particular gene polymorphisms between affected and unaffected subjects taking into account behavioural and environmental risk factors. These methods has led to major advances in the identification of host genes involved in human susceptibility to malaria and schistosomosis.

Our objective was to study the role of IL-10, IL-4, IL-2 and TNF-α gene DNA polymorphisms in HAT. These cytokines are strongly involved in the immune response to the disease. Two complementary association studies have been performed: a Classical Case Control study and a Transmission Desequilibrium Test (TDT) to avoid population admixture or incomparability between cases and controls. Genetic markers used are Single Nucleotid Polymorphisms (SNPs).

Our results showed a significant association between two polymorphisms and the disease (one at the –308 base pairs to the promoter of TNFα gene and the second one at position –592 of the IL10 gene promoter). Individuals homozygous for the mutation located in the TNFα promoter are predisposed to HAT. Concerning IL10 polymorphism, both homozygous and heterozygous subjects have an increased risk to develop the disease.

These findings are consistent with immunological reports concerning the role of these cytokines in HAT and allow to formulate assumptions about the role of these genetic defects in immune response regulation. Moreover, this SNP at nucleotide -308 relative to the transcriptional start site has been associated with susceptibility to severe malaria and leishmaniasis, emphasizing the putative involvement of this polymorphism in the control of several parasitic infections.

Oral communication

Abundance and diversity of trypanosomes circulating in the sleeping sickness focus of Bonon, Côte d'Ivoire.

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In order to better understand the relationships between the trypanosome, the tsetse, and the mamalian hosts (man and animals), we tried to characterise the trypanosomes found in these actors of the pathogenic system by using several techniques: microscopical examination, *invitro* culture (KIVI), *invivo* culture (rodent inoculation, RI), and PCR using satellite and microsatellite sequences.
From a total of 16,000 captured tsetse (*Glossina palpalis palpalis*), 1680 were dissected and 25% were infected by trypanosomes. On these infected tsetse, the most prevalent trypanosome was *T. congolense* riverine-forest type (Tcf), followed by *T. vivax*, *T. brucei* sensu lato and *T. congolense* savannah type (Tcs). Mixed infections by two or three of these trypanosomes were also found. Within *T.brucei* infected tsetse, PCR allowed to distinguish *T.b.gambiense* group1 on some tsetse, from *T.b.* "non gambiense group 1" (presumably Bouafle group or *T.b. brucei*) in others.
From humans, out of 74 patients, 43 KIVI gave a positive isolation result. By isoenzymes, all the stocks appeared to belong to *T.b.gambiense* group 1 zymodeme 3. This monomorphism of human stocks from Côte d'Ivoire by KIVI has already been reported.
From a sample of 9 pigs presents in the focus, all were found positive by PCR, whereas only 4 of them were found infected by microscopical examination (HCT); PCR showed mixed infections of *T. brucei* s.l. and *T. congolense* forest in the 9 samples. Trypanosomes were isolated by using KIVI in the 9 samples, and at the end of the culture, only *T. brucei* subsisted. Zymodemes identified by isoenzymes constitued a new genetic group of *T. brucei*, different from those from humans.
These results show a great circulation of mixture of genotypes of trypanosomes at the interspecific and intraspecif level. The interactions between all these types of trypanosomes in the tsetse and the mammalian hosts should be taken into account in the epidemiology of sleeping sickness and might provide new information on the transmission of this disease.

Présentation orale

Abondance et diversité des trypanosomes circulant dans le foyer de maladie du sommeil de Bonon, Côte d'Ivoire

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Dans le but de comprendre les interactions entre le trypanosome, la tsé-tsé et l'hôte mammifère (homme et animal), nous avons utilisé plusieurs techniques d'identification des trypanosomes: l'examen microscopique, la culture invitro (KIVI), la culture invivo (inoculation aux rongeurs, RI), et la PCR avec des marqueurs satellites et microsatellites.

Sur 16000 *G. palpalis palpalis* capturées dans le foyer, 1680 ont été disséquées, et un taux d'infection global de 25% a été trouvé à l'examen microscopique. Sur les tsé-tsé infectées, le trypanosome le plus présent était *T. congolense* type forêt (Tcf), puis *T. vivax*, *T. brucei* sensu lato et *T. congolense* type savane (Tcs). Des infections mixtes associant deux ou trois de ces groupes taxonomiques dans une même tsé-tsé ont été trouvés. Sur les glossines infectées par *T. brucei s.l.* (par PCR), nous avons pu différencier *T.b. gambiense* groupe 1 d'autre *T. brucei*, « non-gambiense groupe 1 » (probablement *T.b.* Bouaflé ou *T.b. brucei*).

Sur 74 malades de THA dans le foyer, nous avons pu isoler 43 souches de trypanosomes à partir du KIVI. Par isoenzymes, toutes les souches appartiennent à *T. b. gambiense* groupe 1 zymodème 3. Ce monomorphisme des souches humaines de Côte d'Ivoire a déjà été décrit.

Sur un échantillon de 9 cochons prélevés au même endroit que les malades, 4 ont été trouvés infectés par l'examen parasitologique (HCT), et 9 par PCR. 9 souches ont pu être isolées par KIVI et 6 souches par RI. La PCR a montré sur les 9 cochons des infections mixtes à *T. brucei* s.l. et *T.c.f.* Au moment de la récolte par KIVI, seul *T. brucei* était présent, et la caractérisation isoenzymatique a montré un nouveau groupe génétique. Aucun des trypanosomes isolés du cochon n'était identique à ceux isolés de l'homme.

Ces résultats suggèrent une intense circulation de divers génotypes de trypanosomes au niveau inter et intra-spécifique chez le vecteur et l'hôte mammifère. Les interactions entre ces trypanosomes pourraient jouer un rôle important dans l'efficacité de la transmission de la THA et devraient être prises en compte.

Géographie et Trypanosomose Humaine Africaine à Bonon, en zone forestière ivoirienne : un diagnostic spatialisé du risque trypanosomien au service de la lutte.

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Dans le difficile contexte socio-politique ivoirien actuel, les acteurs de la lutte contre la THA souhaitent hiérarchiser le territoire selon le risque épidémiologique en définissant, à travers l'étude du foyer actif de Bonon (140 cas dépistés depuis 2000), des indicateurs permettant d'adapter les programmes de prévention et de lutte à l'intensité du risque sanitaire.

La distribution socio-spatiale hétérogène de la prévalence à Bonon dépend notamment des variables sociétales qui modulent l'exposition des populations à une éventuelle contamination. Si l'existence d'une transmission péri-urbaine au sud de la ville est établie (90,5% des cas sont retrouvés en ville et dans les campements sud), l'étude des pratiques spatiales des malades associée aux données sur la présence des vecteurs dévoile une possible transmission intra-urbaine.

De plus, l'ethnie Mossi, la plus touchée (27,1% des cas), est urbaine à 92,3% et fréquente 3,6 points d'eau par personne, dont plus de la moitié (53,3 %) sont utilisés par d'autres trypanosomés. Les plantations de café et/ou cacao (62,5% des cultures pratiquées par l'ethnie), nécessitent un trajet de 4,5 km en moyenne. Les différentes mobilités ethniques participent à l'inégalité du risque de contamination des populations.

La confrontation des données entomo-épidémiologiques aux diverses variables impliquées dans le cycle trypanosomien permet de déceler des lieux et comportements pathogènes, utiles à l'orientation de la lutte dans ce foyer. Il sera nécessaire d'affiner et de tester ces indicateurs pour renforcer l'efficacité des futures actions (prospections médicales, surveillance épidémiologique...) dans les autres foyers ouest-africains.

Geography and African Human Trypanosomiasis in the forest region of Bonon, Ivory Coast : a spatial diagnosis to aid in the fight against the risk of trypanosomiasis.

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In the current social-political context of the Ivory Coast, those fighting against HAT wish to assess the prevalence of trypasomiasis in different areas according to their epidemiological risk. By studying the active focus area of Bonon (96 cases discovered between 2000 and 2002), the definition of different indicators will allow the adaptation of national initiatives to the intensity of the sanitary risk.

The heterogeneous socio-spatial distribution of the HAT prevalence notably depends on social variables which modulate the potential exposure of human societies to an eventual contamination. If the existence of a suburban transmission is established (90.5% of the cases can be found in the city and in the south camp areas), the in depth study of the spacial practice of the patients shows a possible transmission in urban areas.

The Mossi people, the most affected (27,1% of the cases), live for 92,3% in residential area and cater for water at the rate of 3,6 waterpoints per person, in which more than half are also visited by others patients. Coffee and cacao plantations are cultivated by 62,5% of these people, who do daily a mean of 4.5 km to go to their fields.

Different ethnical mobilities contribute to an unequal exposure of those populations to the contamination risk.

The entomo-epidemiologic data once compared to the different variables in the trypanosomian cycle shows very close relationships which allows the discovery of pathological areas and behaviors in this focus, useful to reinforce the efficiency of future health initiatives in other national focuses.

Updating the situation of sleeping sickness in Bahr El Jabel State , Southern Sudan

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Abstract

The active-surveillances carried out on Nov. 2001, in Kator, Rejaf West and Rejaf East localities showed the highest sero-prevalence rate of 28.35%,10.96 and 10.26% respectively, while Rokon and Luri localities showed the lowest sero-prevalence rate of 7.19 and 4.43%, respectively.

In Feb 2002 the survey was continued in Baher El Jabel State in areas left in past survey in November: Gumba , Kit , Logo east and Luri. The serological prevalence in this areas respectively was 7.45, 7.69, 8.22 and 0%.The data analysis showed there was no significant relationship (P>0.05) between exposure to disease and the sex or age of the so far examined people in the region.

In July (2002) another survey was conducted on internal displaced people settled in camps around Juba, the results showed that the percentage of the seropositive among these population (735) was 11.56 % , which indicated the presence of the disease in Eastern Equatoria. According to the data analysis, the variation among these areas to exposure to the disease is not significant (>0.05) because all areas were sleeping sickness endemic areas.No parasitologicaly positive case was detected.

A recent surveillance (Jan-2003) In Bahr ElJabel State was carried out on the internal displaced people from different areas in Eastern Equatoria (Torit, Labonok, Sindru, Bongu), were settled in camps around Juba. In Torit camps the population screened was 53% of the estimated population (1000) and 3.14% of them were serologically positives. In Jabel kujor camps, the results showed that 7.8% of the population screened was seropositives, and 1.5% was parasitological positives.
The survey was conducted also in Lologo and Rejaf East (areas with high percentage of seropositives). The total numbers screened were 24 out of 200 suspected cases. Six cases out of 24 suspected cases were found again serologically positive. No parasitological cases were detected among these seropositives.

In Terkaka province out of the estimated population (3000) in these areas only 35.8% was screened. In both Terkaka town and Muni the seroprevalence rate was 3.5%, no parasitological cases were detected.

Key words: Seeping sickness; Bahr ElJabel State; CATT, Sroprevalence rate

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Historical Review of Sleeping sickness in Sudan

Intisar E. El Rayah*

Abstract

The southern Sudan has suffered series of HAT epidemics. In the last century the disease was first recorded in 1912, since then it is confined to the southern district of Equatoria Province.

Series of succession epidemic occurred in the Yubu (1931-42) , Yambio and Yei (1931-35 and 1937) and Kajo-Kaji districts (1934-39 and 1941-42) were controlled using case detection and treatment (Wilcocks and Corson,1946).

As a result of the first civil war in the southern Sudan a major epidemic of HAT occurred in Yambio-LiRangu –Nzara area (Bloss, 1960; Morris, 1961). The prevalence of the disease was reduced from 8% to 0.5%.

A current severe epidemic of HAT has affected people living in the Tumbura, Yambio, Maridi, Yei and Nzara district in the western Equatoria State.

Recent surveillance of HAT carried out in Eastern and Bahr EL-Jabel States showed a disease sero- prevalence of 19.3 and 30.3%, respectively, using the card agglutination test for trypanosomosis (CATT), (ElRayah, et al 1999)

In the Sudan information regarding HAT epidemiology, etiology and ecology of tsetse fly potential vector are lacking, although these are pre requisites for any attempt to evaluate the management of the disease and to formulate a suitable control strategy.

Key words: Sleeping sickness; Western Equatria; Epdemic series, Prevalense rate; control

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Résumé

Titre :
Faisabilité et sécurité du traitement de la trypanosomiase africaine humaine (*T. b. gambiense*) par 14 jours d'eflornithine parentérale au Sud Soudan et comparaison avec une cohorte historique de 990 patients traités par mélarsoprol.
F. Chappuis et al. – MSF-Switzerland

Introduction
Un programme de contrôle de la maladie du sommeil a été initié par MSF-Suisse en juin 2000 dans le Conté de Kajo-Keji au Sud-Soudan, une région d'endémicité de la trypanosomiase africaine humaine (TAH) due à *T. b. gambiense*. De juin 2000 à décembre 2002, les patients au stade méningo-encéphalitique (stade 2) de la maladie ont été traités par mélarsoprol (2.2 mg/kg/j pendant 10 jours). Depuis janvier 2003, ce traitement de première ligne a été remplacé par l'eflornithine 400 mg/kg/j iv pendant 14 jours. Nous rapportons ici notre expérience et les données acquises pendant les 9 premiers mois d'utilisation de l'eflornithine et nous les comparons avec une cohorte historique de 990 patients traités par mélarsoprol.

Méthode
Les données cliniques, de laboratoire, de traitement, de toxicité ainsi que de suivi des patients traités au Centre de Traitement de Kiri depuis juin 2000 ont été enregistrées dans des questionnaires standards puis entrées dans YoTryp, un programme basé sur Access. En plus du suivi standard (6, 12 et 24 mois), les patients traités par eflornithine ont reçu la visite d'un agent de santé 2 à 4 semaines après leur sortie de l'hôpital afin d'évaluer la morbidité et la mortalité post-hospitalières. Les taux d'hémoglobine et de leucocytes ont été mesurés avant et après le traitement d'eflornithine. Les données seront extraites de YoTryp en septembre 2003 et analysées par SPSS.

Résultats et discussion
Les données de morbidité et mortalité liées au traitement d'eflornithine chez environ 200 patients seront présentées pendant la réunion et seront comparées aux données d'une cohorte de 990 patients traités par mélarsoprol. La prévention des infections liées aux cathéters et d'autres aspects des soins infirmiers seront présentées. Les avantages et désavantages du traitement d'eflornithine dans la TAH de stade 2 dans le Conté de Kajo-Keji, une zone de faible résistance au mélarsoprol, sera discutée.

Abstract

Title :
Feasibility and safety of 14 days intravenous eflornithine for the treatment of Human African Trypanosomiasis (*T. b. gambiense*) in South-Sudan and comparison with an historical cohort of 990 patients treated with melarsoprol

F. Chappuis et al. – MSF-Switzerland

Introduction
A sleeping sickness control program was initiated in June 2000 by MSF-Switzerland in Kajo-Keji County, South-Sudan, an area endemic for Human African Trypanosomiasis (HAT) due to *T. b. gambiense*. From June 2000 to December 2002, patients with the stage 2 HAT were treated with melarsoprol (2.2 mg/kg/d iv for 10 days). Since January 2003, first-line treatment was replaced by eflornithine 400mg/kg/d iv for 14 days. We report here our experience and data on the first nine months of eflornithine use and we compare it with an historical cohort of 990 patients treated with melarsoprol.

Methods
All clinical, laboratory, treatment, toxicity and follow-up data of patients treated in Kiri Sleeping Sickness Treatment Centre since June 2000 were recorded on a standardized patient's file and entered in YoTryp, an Access-based computer program. In addition to the usual follow-up schedule (6, 12 and 24 months), the patients treated with eflornithine were visited by a health worker 2 to 4 weeks after hospital discharge to assess post-hospitalisation morbidity and mortality. White blood cell and hemoglobin counts were measured before and after eflornithine treatment. Data will be extracted from YoTryp in September 2003 and analysed with SPSS software.

Results and discussion
Data on eflornithine treatment-related morbidity and mortality on around 200 patients will be presented in the meeting and compared with the data of the historical cohort of 990 patients treated with melarsoprol. The prevention of catheter-related infections during eflornithine therapy and other aspects of nursing care will be presented. The pros and cons of eflornithine as first-line treatment of stage 2 HAT in Kajo-Keji County, an area of low relapse rate after melarsoprol therapy, will be discussed.

HUMAN AFRICAN TRYPANOSOMIASIS ARE DETECTED IN URBAN AREA THE GOAL IS TO DETERMINE IN A URBAN ENVIRONNEMENT THE PROBABLY INFECTION POINTS OR THE CONTACTS POINTS BETWEEN MEN AND TSETSE FLIES IN KINSHASA TOWN

Philémon Mansinsa Diabakana, Jackie Makabuza Mukabela, Constantin Miaka mia Bilenge, Victor Kande Betu Kumeso
Programme National de Lutte contre la THA en RDC

SUMMARY

Five years ago, a lot of cases of human African trypanosomiasis are detected in urban area in Democratic Republic of Congo. All of the big towns of the country are concerned. The goal is to determine in a urban environnement the probably infection points or the contacts points between men and tsetse flies.

In this work, an identification of the all of hydrographical network and the forestry block in the city permit us to determine where the capture of tsetse flies will be done in Kinshasa.

The Lancien-Gouteux traps of tsetse flies was installed the long of rivers of Kinshasa, and in forestry blocks in to the city and his hinterland.

Tsetse flies was captured in the peripheral area of Kinshasa. Some tsetse flies was captured in urban area in the popular cities and in the valleys near of some rivers.

The entomological geo-referenced data are incorporate for illustrated the spatial distribution of tsetse flies at Kinshasa.

The analysis of the results show that a lot of persons are infected in the periphery of the city in they farms and gardens where they began to go since last pillaging who are destroyed the job of a lot of person at Kinshasa. They are nevertheless some contamination point inside the urban agglomeration of the city of Kinshasa.

LA TRYPANOSOMIASE HUMAINE AFRICAINE EN MILIEU URBAIN DETERMINATION DES POINTS DE CONTACT HOMME-GLOSSINE DANS LA VILLE DE KINSHASA

Philémon Mansinsa Diabakana, Jackie Makabuza Mukabela, Constantin Miaka mia Bilenge, Victor Kande Betu Kumeso
Programme National de Lutte contre la THA en RDC

RESUME

Depuis près de 5 ans, de nombreux cas de THA sont détectés dans les milieu urbain en République Démocratique du Congo. La plupart des grandes villes sont concernés. La question qui s'était toujours posés était de déterminer dans un environnement urbain les endroits probables d'infection c'est à dire les endroits de contact entre l'homme et la mouche tsé-tsé.

Dans ce travail, une identification de l'ensemble du réseau hydrographique de la ville de Kinshasa et les îlots forestiers a permis de déterminer les endroits de capture des glossines dans la ville de Kinshasa.

Des pièges à mouches tsé-tsé de type Lancien-gouteux ont été installés le long de tous les cours d'eau de la ville de Kinshasa, ainsi que dans les amas forestiers à l'intérieur tout comme dans l'hinterland de la ville.

Des mouches ont surtout étaient capturés dans la périphérie de la ville à la limite entre Kinshasa urbain et rural. Des captures régulières ont été réalisés en plein milieu urbain dans les communes populaires et dans les vallées le long de certains cours d'eau.

Les données entomologiques géoréférencés ont été repris pour illustrés la distribution spatiale des mouches tsé-tsé dans la ville de Kinshasa.

L'analyse des résultats obtenus laisse entrevoir que la plupart des personnes s'infectent dans la périphérie de la ville lorsqu'il vont dans leurs porcheries et jardins, habitudes créées depuis les derniers pillages qui ont entraîné la perte de leur emploi à une grande portion de la population, mais qu'il existe aussi d'autres points de contamination à l'intérieur même de l'agglomération urbaine.

(ISCTRC)

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I wish to present the following paper as an oral presentation:

English summary:

Central nervous system involvement in Human African trypanosomiasis: from cellular mechanisms to field diagnosis.

Courtioux B[1], Boda C[1, 2], Boumediène A[3], Roques P[2], Josenando T[4], Vatunga G[4], Ayenengoye CR[5], Bouteille B[1], Jauberteau MO[1,3], Bisser S[1, 2].

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Stage determination in Human African Trypanosomiasis (HAT) has recently been improved. Intrathecal immune response, blood cerebrospinal-fluid (CSF) barrier dysfunction, specific antibodies can assess central nervous system (CNS) involvement. Total CSF-IgM detection is the only new available field test and should be used on large scale for diagnosis. However, their detection is not specific, can fail and cellular mechanisms involved in their production are not clearly understood. The aim of this study is to characterise these mechanisms.
Thirty confirmed *T.b.gambiense* infected patients and 6 controls were included. Patients were identified actively and passively in Angola and Gabon. Paired blood and CSF samples were taken. According to CSF cell number, CSF-IgM or trypanosome detection, 3 groups were identified: early-stage, intermediate-stage and late-stage. Blood and CSF cells were analysed by flow cytometry to identify proportions of T cells (CD3), B cells (CD19), sub-populations (CD4, CD8, CD56) and activation profiles (CD25, CD5, CD95, CD40). Cytokine profiles (TH1 versus TH2) and chemokine levels (RANTES, MIP-1α, IL-8) completed the data.
Whole blood analysis showed a high lymphocyte count in all disease stages compared to controls. Controls showed prevalence of T cells with scarce activation. NK cells were present with a prevalence of NK-T cells. Early, intermediate and late stage patients showed a similar increase in activated B cells (16 %). Activated T cells were scarce with predominance of CD4 cells. NK-T cells were present.
In CSF, a regular increase in activated B cells is observed, early-stage patients already showed B cell activation compared to controls. Early and Intermediate-stage patients showed a prevalence of activated CD4 cells and presence of NK-T cells compared to late-stage patients.
Cellular profiles in CSF can elucidate mechanisms of trypanosomes invasion and can be used even when cells are scarce. Field applications are discussed.

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French summary:

Les mécanismes d'invasion du système nerveux central dans la trypanosomose humaine africaine: caractéristiques cellulaires et application de terrain

Courtioux B[1], Boda C[1, 2], Boumediène A[3], Roques P[2], Josenando T[4], Vatunga G[4], Ayenengoye CR[5], Bouteille B[1], Jauberteau MO[1,3], Bisser S[1, 2].

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Le diagnostic du stade dans la trypanosomose humaine africaine s'est amélioré récemment. La recherche d'une synthèse intrathécale, d'une altération de la barrière hémo-méningée ou d'anticorps spécifiques peut affirmer l'atteinte nerveuse. Seul, le dosage des IgM totaux du liquide céphalo-rachidien (LCR) est un test de terrain et devrait être utilisé à grande échelle. Cependant, ce test est non spécifique et ne permet pas toujours de dépister des stades nerveux débutants. De plus, les mécanismes cellulaires aboutissant à leur production ne sont pas clairement élucidés. Notre objectif est de caractériser ces mécanismes.
Trente patients confirmés parasitologiquement et 6 témoins ont été inclus. Les patients ont été identifiés activement et passivement en Angola et au Gabon. Ils ont été divisés en 3 groupes (stade précoce, intermédiaire et tardif) en fonction du nombre de cellules, des IgM totaux ou de la présence de trypanosomes dans le LCR. Sang et LCR ont été caractérisés en cytométrie de flux afin d'identifier la proportion de cellules T(CD3), B(CD19), les sous-populations (CD4, CD8, CD56) et leur profil d'activation (CD25, CD5, CD95, CD40). Les profils cytokiniques (TH1 versus TH2) et le dosage de chémokines (RANTES, MIP-1α, IL-8) a permis de compléter les données.
Une hyperlymphocytose sanguine est caractéristique chez les patients de même que la présence de cellules B activés (16 %). Les cellules T activées sont rares avec prédominance de CD4. Les cellules NK-T sont majoritaires.
Les témoins présentent surtout des cellules T, peu sont activés, les NK-T sont majoritaires.
Dans le LCR, les cellules B activées augmentent en fonction du stade tandis que les cellules CD4 activées et NK-T diminuent. Les patients au stade précoce ont une activation cellulaire comparée au témoin.
Les profils cellulaires du LCR peuvent permettre de caractériser les mécanismes d'invasion du système nerveux central. Les applications de terrain sont discutées.

ANGOLAN EXPERIENCE IN SLEEPIN SIKNESS RESEARCH

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The « Laboratório de Referência e de Investigação de Viana" – LRIT is one of the 3 departments of the ICCT witch is situated at 12 km around Luanda. This laboratory is in charge of scientific research, quality control and training in trypanosomiasis domain. Since four years, this laboratory is releasing research activities with international institutions collaboration.
Among several research activities done in this laboratory we can quote:

- Geographical, epidemiological and biological evaluation data about Human African Trypanosomiasis in Angola.
- Improvement of the treatment in H.A.T in late stage of the disease.
- Clinical trial about DB289, an oral treatment for the early stage of H.A.T.
- Treatment failure survey about Melarsoprol (in some Angolan regions this failure reach 30%).
- Evaluation of clinical and bioquimical factors linked to encefalopaty syndrome.

Also other laboratory and fled activities are being planed in epidemiological survey and antivectorial domain.

During the meeting we should be in the capacity to present our participation in the studies above mentioned but ours partners have more authority to talk about the results we believe their will be present in that important meeting.

EXPERIENCE DE L'ANGOLA DANS LE DOMAINE DE LA RECHERCHE SUR LA MALADIE DU SOMMEIL

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Le «laboratório de referência e investigação das tripanossomíases de Viana » LRIT est l'un de trois départements nationaux de l 'ICCT.
En Angola, ce laboratoire s'occupe, entre autre, des recherches scientifiques appliquées dans le domaine des trypanosomoses.
Depuis environ 4 ans, ce laboratoire réalise divers travaux de recherches en collaboration avec des institutions internationales.
Nous pouvons citer les travaux sur :

- l'évaluation des données épidémiologiques, biologiques et géographiques de la THA en Angola en vue d'améliorer la stratégie nationale de lutte;
- l'amélioration du traitement de la période nerveuse de la THA ;
- la phase IIa des essaies cliniques de la molécule DB 289 dans le traitement de la première période de la maladie ;
- la surveillance des échecs thérapeutiques dont le taux de résistance au médicament de première ligne (Melarsoprol) pour le traitement de la phase nerveuse se situe aux alentours de 30% dans certaines provinces endémiques du pays ;
- l'évaluation de certains paramètres cliniques et biochimiques liés à la maladie du sommeil.

Outres les travaux évoqués ci- dessus, le laboratoire se propose de réaliser des études dans le domaine de la surveillance épidémiologique et la lutte antivectorielle.
Loin de présenter à l'assemblée les conclusions de ces études réservées à leurs illustres promoteurs qui, pour la quasi-totalité prendront part à la conférence, nous présenterons notre expérience dans le domaine de la recherche.

PSYCHOLOGICAL PERTURBATIONS ON SPEELING SICKNESS PATIENTS IN ANGOLA

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Sleeping Sickness constitue a serious health problem at individual and community level.

Psychic perturbations are psychosomatic manifestations that can be caused by different pathologies.

Sleeping Sickness, besides a number of distinct symptoms, is also characterized by psychological troubles of different types. Mood disturbances can persist in the patient, as sequelae, after the treatment and even after recovery from the disease.

This is an invalidant factor who can contribute to a reduction of the intellectual and working capacities of the patient to the point to be considered as useless from the society.

Sometimes the patient is even banish from his surroundings.

From this perspective, sleeping sickness can be seen as a social disease because its capacity to weaken harmony and balance of the society and hamper factor to the socio-economic development.

In sub-saharian Africa, a patient with psychological perturbations of any kind, is frequently considered as "mad" or under the influences of magical spells.

These two last factors contribute even more to neglect and marginalize the patients from his environment.

In Angola, we observe cases of mood disturbances among sleeping sickness patiens with frequents phenomena of family's rejection and marginalization.

At the "laboratório de referência e investigação das tripanossomíases de Viana"; Luanda, we followed 50 sleeping sickness patients, at different degrees of disease, in order to identify forms and degrees of psychological disturbances, determinants factors, presence and value of eventual factors of predisposition. Analysis of socio-economical impact of these psychological perturbations is also take into account.

The importance to consider, among others, the mental health of sleeping sickness patients is stressed.

ETUDE DES PERTURBATIONS PSYCHOLOGIQUES CHEZ LES SOMMEILLEUX EN ANGOLA

I.M.M. Josenando, Psychologue, G. Vatunga, MD
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La maladie du sommeil est un problème de santé individuelle et communautaire grave.

Les perturbations psychiques sont des manifestations d'atteinte psycho-somatique causées par diverses pathologies.

Les perturbations psychologiques de différents types sont parmi les innombrables manifestations entraînées par la trypanosomose. Elles peuvent, malheureusement, demeurer en état de séquelles après le traitement et même après la guérison. Ceci est un facteur invalidant et débilitant qui réduit considérablement les capacités intellectuelles et laborales du malade au point d'être consideré comme inutile par le reste de la société. Quelques fois, il est banni par son entourage. Vu sur cet angle, la trypanosomose apparaît comme une maladie sociale, car elle fragilise l'harmonie et l'équilibre de la société et apparaît, par conséquent, comme un obstacle au développement. En Afrique sub-saharienne, une personne présentant des perturbations psychologiques, quel que soit son type, est considerée vulgairement comme souffrant de "folie" ou même frappée par les mauvais esprits. Ceci, comme nous l'avons déjà vu un peu plus haut, renforce le phénomène d'abandon et de marginalisation du malade par son entourage. En Angola, on observe des cas de perturbation psychique chez les sommeilleux, ils sont abandonnés ou même reniés par leur proche. Ceci nous a pousse a réaliser une étude sur 50 patients au « laboratório de referência e investigação das tripanossomíases de Viana » pour d'une part identifier les différents types de problèmes psychologiques auxquels sont confrontés les sommeilleux, leurs éventuels facteurs déterminants ou prédisposants. Nous pensons que un apport pluridisciplinaire est important pour une prise en charge plus adaptée et appropriée de ces cas.

417 Replaced

Sleeping sickness caused by *Trypanosoma brucei rhodesiense* continues to spread in north eastern Uganda

J.C.K. Enyaru, E. Matovu, M.Odiit, M.Akol, D. Okitoi and C. Sebikali

Livestock Health Research Institute (LIRI), Tororo, Uganda

In Uganda the two forms of sleeping sickness occur: *T.b.rhodesiense* which causes the acute form of sleeping sickness is found in south eastern Uganda while the *T.b.gambiense*, the causative of the chronic form of the disease occurs in northwestern Uganda. Sleeping sickness cases had not been reported in Soroti district until 1967 when a case was identified in the fishing village of Kagwara, Soroti district. Since 1968 to 1989, no sleeping sickness case was reported in Soroti district until 1990 when one case of sleeping sickness was reported in Serere county. However, in 1998 there was an out break of sleeping sickness in Serere county during which 38 sleeping sickness cases were parasitologically confirmed .The main cause of the sleeping sickness out break was identified among others as due to the restocking of Soroti district with cattle from sleeping sickness endemic areas in south eastern Uganda. Other causes like the movement of persons who had migrated to the sleeping sickness endemic areas during the civil strife back to their areas of origin in Soroti district may also have contributed to the out break. Active surveillance of sleeping sickness was carried out in Asuret county, Soroti district, to assess the magnitude of the problem in the new focus of the disease. The wet thin blood smear and the microhaematocrit centrifugation techniques were used to screen persons who assembled at the selected screening sites. Three villages were screened and their infection rates varied from 1.5 to 2.4% Sleeping sickness has continued to spread to other counties in Soroti district with Asuret county having a high transmission focus with infection rate of 2.1%. Two cases of sleeping sickness have been reported in March 2003 from Kaberamaido district further north east Uganda bordering with Lira district, northern Uganda, indicating how fast the disease is spreading. The spread of sleeping sickness could now be due to the movement of cattle as well as the dense tsetse habitats which have sprang up in the areas as a result of reduced land use.

27TH MEETING OF THE INTERNATIONAL SCIENTIFIC COUNCIL FOR TRYPANOSOMIASIS RESEARCH AND CONTROL (ISCTRC)

Name	MARTIN ODIIT
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I wish to present the following paper

Oral:

1. **Assessing health seeking behaviour among sleeping sickness patients in eastern Uganda**

M. Odiit, A. Shaw, S. C. Welburn, E. M. Fèvre, P.G. Coleman, J.Mcdermott and M. E. J. Woolhouse

Abstract

To study the patterns of health seeking behaviour among sleeping sickness patients in Eastern Uganda, data on socio-demographic and clinical characteristics, health seeking behaviour and delays to presentation and diagnosis was collected from diagnosed sleeping sickness patients. Analysis of Odds Ratios was used to examine factors associated with delay. Among 119 patients, median total delay to diagnosis was 2 months with service provider delay contributing a greater proportion than patient delay. Patient and service provider delays were both independently associated with sleeping sickness patients presenting in the late stage. The absence of a blood examination test at the first visit is associated with service provider delay. Most patients were referred to the sleeping sickness hospital by either the community or on their own initiative and not by the health system. There is considerable delay between symptom onset and diagnosis among sleeping sickness patients. Substantial delay was attributable to the service provider failure to diagnose sleeping sickness among symptomatic individuals.

R. Omolo. SUDAN

From: Solomon Hailemariam
Sent: Monday, April 28, 2003 4:12 PM
To: R. Omolo.
Subject: FW: conference(ISCTRC)

2 papers (E)

Dear Rispa. Please take note. Solomon
-----Original Message-----
From: khalil mohamed [mailto:khallll73@hotmail.com]
Sent: 23 April 2003 14:35
To: Dr. J. Musiime
Cc: Solomon Hailemariam; rbagnall@mweb.co.za; bagnallr@allerton.kzntl.gov.za
Subject: conference(ISCTRC)

Dear Dr.
I want to participate in 27TH ISCTRC

Name: Khalil Mohamed Khalil
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I wish to present the following papers:

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BIOCHAMICAL CHANGES IN SLEEPING SICKNESS SAMPLES DETECTED BY USING CATT IN SUDAN

Khalil M. Khalil[1]; Atif E. Abdel Gader[2] ; Khitma H. El Malik[2]. Intisar E.El Rayah[3]

Biochemical examinations on 48 serum samples from Bahar Eljebal state and Eastern Equatoria state were done and analyzed statically using t-test. The concentration of total serum proteins and serum globulins increased in positive cases of sleeping sickness using CATT ($P = 0.004 < 0.05$, $P = 0.015 < 0.05$, respectively), but no changes were observed in serum ion measurement (sodium, potassium, calcium and zinc), ($P = 0.371 > 0.05$, $P = 0.111 > 0.05$, $P = 0.744 > 0.05$ and $P = 0.20 > 0.05$, respectively.

Melarsoprol short course: Results from a multicountry evaluation

Cecile Schmid[1], Johannes Blum[1], Tom Smith[1], Pierre Cattand[2], Theophile Josenando[3], Mickey Richer[4], Francois Chappuis[5], Constantin Miaka Mia Bilenge[6], Rudy Manthelot[7], Auguste Nangouma[8], Felix Doua[9], Pedro Ndongo Asumu[10] and Christian Burri[1]

The authors present a multinational, multi-centre study to evaluate the efficacy and tolerability of a 10 day treatment schedule for melarsoprol treatment of late stage gambiense sleeping sickness under field conditions.

The study was carried out in collaboration with Ministries of Health and NGOs in 16 centres of 6 countries endemic for the disease. Each center used exclusively the new treatment schedule and enrolled patients for 12 months. A total of 2535 patients were treated according to the new schedule of which 198 with different drug combinations using the 10 day schedule for melarsoprol.

Patient characteristics like age, sex and nutritional status were comparable for all centres. Expectedly, the rates of severe adverse drug reactions (e.g. encephalopathic syndromes, fatalities) showed a very large variation between centres. A high variation was also seen in the reporting of fever and headache. On the other hand, the rates of other important adverse events like skin reactions and polyneuropathies were also in the range of previously reported rates, but did not vary between the centres.

The patients will be followed up for 24 months after treatment. As of April 2003, approximately 50% (range 15 – 100% per country) had at least undergone one follow up examination. Most centres so far reported relapse rates in a low range (average 2.5%) comparable to previous years. However, in two centres of south-western Sudan which had observed elevated relapse rates previous to the study, melarsoprol therapy remained unsatisfactory when the ten day schedule was used (relapse rate 10% & 14%). A high relapse rate was also observed in Brazzaville (11.4%), however no previous figures are available to make a comparative evaluation.

Overall the new schedule was highly appreciated by the patients, many came specifically to centres offering the short course treatment. Physicians appreciated it as well from a technical point of view: daily drug application, no lengthy breaks, no dosage adjustments and a substantially shorter stay at the treatment centre. The compliance with the study protocol turned out to be high in all centres. To our knowledge, the majority of the participating centres continued to use the ten day schedule for melarsoprol after the formal end of enrolment.

[1]Swiss Tropical Institute, Basel, Switzerland; [2]Association against Trypanosomiasis in Africa, St. Lupicin, France; [3]Instituto de Combate e de Controlo da Tripanosomiase, Luanda, Angola; [4]International Medical Corps, Nairobi, Kenya; [5]Medecins Sans Frontières Switzerland, Geneva, Switzerland; 6Programme National de Lutte contre la Trypanosomiase Humaine Africaine, Kinshasa, democratic Republic of Congo; [7]Programme National de lutte contre la Trypanosomiase, Brazzaville, Republic of Congo; [8]Programme National de Lutte contre la Trypanosomiase Humaine Africaine, Bangui, Republique Centrafricaine; [9]Projet de Recherche Cliniques sur la Trypanosomiase, Daloa, Côte d'Ivoire; [10]Programo National de Control de Trypanosomiasis, Bata, Guinea Equatorial;

Protocole de traitement court au mélarsoprol : Résultats d'un essai multicentrique

Cécile Schmid[1], Johannes Blum[1], Tom Smith[1], Pierre Cattand[2], Theophile Josenando[3], Mickey Richer[4], François Chappuis[5], Constantin Miaka Mia Bilenge[6], Rudy Manthelot[7], Auguste Nangouma[8], Félix Doua[9], Pedro Ndongo Asumu[10] and Christian Burri[1]

Les auteurs présentent un essai clinique multinational et multicentrique pour évaluer l'efficacité et la tolérabilité d'un protocole de traitement court de dix jours au mélarsoprol chez des patients au stade avancé de la maladie du sommeil à *T.b. gambiense* et mis en œuvre dans les conditions de terrain.

L'étude a été conduite dans 16 centres de traitement de 6 pays endémiques en collaboration avec les Ministères de la Santé et des ONGs.

Dans chaque centre le protocole court a été mis en œuvre de façon exclusive et tous les malades dépistés pendant 12 mois ont été traités avec ce nouveau protocole. Un total de 2535 malades a ainsi été traité dont 198 avec des combinaisons médicamenteuses incluant le mélarsoprol le protocole court.

Les caractéristiques des patients tel que l'age, le sexe et l'état nutritionnel dans les différents centres étaient comparables. Comme prévu, les résultats en termes de réactions adverses sévères (i.e. syndromes encéphalopatiques, décès) ont montrés une grande disparité entre les centres. On a aussi observé une grande différence dans les rapports concernant la fièvre et les céphalées. Par ailleurs, aucune différence n'a été observée en ce qui concerne le taux des effets adverses comme les problèmes dermatologiques et les polyneuropathies, de plus ces taux étaient tout à fait semblables à ceux rapportés préalablement.

Les patients doivent être suivit pendant 24 mois après le traitement. En avril 2003, environ 50% des malades (15 et 100% selon le pays) ont fait au moins un examen de suivi. A ce jour, la plus part des centres de traitement ont rapporté des taux de rechute faible (moyenne de 2.5%) comparable à ceux des années précédentes. Par contre, dans deux centres de traitement du sud-ouest soudan où un taux élevé de rechute avait déjà fait l'objet d'un rapport, le traitement au mélarsoprol utilisant le protocole de dix jours reste peu satisfaisant (taux de rechute 10% et 14%). On a aussi observé un taux de rechute élevé à Brazzaville (11,4%), mais aucune valeurs pour les années précédentes n'est disponible pour permettre de faire une analyse comparative.

De façon générale, le nouveau protocole a été apprécié par les patients. Nombreux sont ceux qui ont préféré se faire traiter dans les centres offrant le protocole court à cause de la réduction du temps. Ce protocole a aussi été apprécié d'un point de vu technique par les médecins traitant : administration journalière, pas de période de repos, pas d'ajustement de dose et une réduction substantielle du temps d'hospitalisation. A notre connaissance, tous les centres qui ont participés à l'étude ont continués à traiter les patients avec le nouveau protocole après la fin officielle de l'étude.

[1]Swiss Tropical Institute, Basel, Switzerland; [2]Association against Trypanosomiasis in Africa, St. Lupicin, France; [3]Instituto de Combate e de Controlo da Tripanosomiase, Luanda, Angola; [4]International Medical Corps, Nairobi, Kenya; [5]Medecins Sans Frontières Switzerland, Geneva, Switzerland; 6Programme National de Lutte contre la Trypanosomiase Humaine Africaine, Kinshasa, Democratic Republic of Congo; [7]Programme National de lutte contre la Trypanosomiase, Brazzaville, Republic of Congo; [8]Programme National de Lutte contre la Trypanosomiase Humaine Africaine, Bangui, Republique Centrafricaine; [9]Projet de Recherche Cliniques sur la Trypanosomiase, Daloa, Côte d'Ivoire; [10]Programo National de Control de Trypanosomiasis, Bata, Guinea Equatorial;

L'EFLORNITHINE ORALE DANS LE TRAITEMENT DE LA TRYPANOSOMIASE HUMAINE AFRICAINE A T.B GAMBIENSE EN PHASE NERVEUSE

(Résultats observés chez 25 patients à Daloa – Côte d'Ivoire)

Félix DOUA , Norbert Djè N'goran , Tanoe Miézan Wamian et Félix Boa Yapo

Résumé

25 patients en phase nerveuse de la trypanosomiase humaine africaine (THA) ou maladie du sommeil ont reçu de l'Eflornthine en monothérapie par voie orale . Ces patients ont été divisés aléatoirement en deux goupes A et B . Les patients du groupe A (n=12) ont reçu 400 mg/kg/j d'Eflornithine pendant 14 jours et ceux du groupe B (n=13) ont reçu 500 mg/kg/j pendant 14 jours .

Dans ces deux groupes de patients , le taux de guérison initiale (disparition des trypanosomes des liquides biologiques 24 heures après la fin du traitement) a été de 100%. Les effets secondaires du traitement marqués par les troubles digestifs et hématologiques ont été tous réversibles à la fin du traitement et aucun cas de décès n'a été enregistré au cours de l'hospitalisation des patients .

Pendant le suivi après traitement , un patient du groupe A est décédé 4 mois après la fin de son traitement à son domicile des suites d'une pneumopathie . 8 cas de rechute (32%) ont été notés au total dont 4 du groupe A et 4 du groupe B .

Sur les 16 patients encore en compte aucun nouveau cas de rechute n'est observé , mais un patient reste toujours perdu de vue 18 mois après la fin de son traitement . Sur les 15 patients restants , un a un recul de 6 mois après traitement , 10 ont un recul de 12 mois , 3 ont un recul de 18 mois et un a un recul de 23 mois .

Dans cette étude il n'a pas été notée de différence au plan de la tolérance et de l'efficacité entre les deux posologies de l'Eflornithine orale.

La recherche d'une dose maximale orale bien tolérée et efficace reste nécessaire pour l'enregistrement de cette formulation de l'Eflornithine dans le traitement de la THA à T.b. gambiense .

brucei s. l. a été détecté par PCR confirmant le manque de sensibilité des tests parasitologiques. Nous avons identifié les extraits d'ADN à l'aide de plusieurs marqueurs utilisant des séquences satellites, minisatellites et microsatellites. Les résultats ont montré que les trypanosomes circulant chez ces patients asymptomatiques semblent constituer une nouvelle entité génétique différente du classique groupe 1 de *T. b. gambiense* et du groupe « bouaflé ». Les conséquences épidémiologiques de ce résultat sont discutées dans cette communication, en incluant le concept de la susceptibilité individuelle à la maladie (trypanotolérance humaine).

lack of sensitivity of the parasitological tests used. The extracted DNA were studied by various recent identification techniques using satellite, minisatellite and microsatellite markers. Results showed that trypanosomes circulating in these asymptomatic patients seem to constitute a new genetic entity, different from the classical *T. b. gambiense* group 1 and bouafle group. The epidemiological consequences of the existence of such a new group are discussed here, including the concept of the individual susceptibility to the disease (human trypanotolerance).

Comparaison de l'utilisation des principes actifs et des médicaments pour les tests *in vitro* de chimiosensibilité des formes sanguicoles de *Trypanosoma brucei gambiense*

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Les tests *in vitro* de chimiosensibilité sont généralement réalisés pour les trypanosomes africains en utilisant les versions commerciales des médicaments (Pentamidine, Germanin, Ornidyl, Lampit, Arsobal, Bérénil). Cependant, aucune étude n'a été faite pour évaluer les variations d'activité trypanocide des médicaments selon les lots de fabrication, les conditions de stockage, la pureté du principe actif et sa forme (poudre ou solution), l'effet trypanocide éventuel de certains excipients. Pour pouvoir standardiser les techniques, il est nécessaire d'effectuer des tests comparatifs sur des souches de trypanosomes de référence en utilisant en parallèle le principe actif d'une part, et la version commerciale du médicament d'autre part. Les résultats pour la comparaison en particulier DFMO/Ornidyl montrent des différences de détermination des Minimum Inhibitory Concentrations (MIC) pour la même souche. Par exemple la souche (RO15) présente des valeurs élevées pour la molécule commerciale (Ornidyl) testée par rapport à sa forme active (DFMO SIGMA) et des valeurs identiques pour les autres molécules. D'autres résultats pour les diamidines et concernant le stockage des lots commerciaux sont discutés. Il semble impératif de n'utiliser que le principe actif fourni par SIGMA ou une autre compagnie pour standardiser les protocoles et comparer les résultats obtenus par différentes équipes.

Comparison of *in vitro* activities of drugs compared with active molecules for MIC determination for bloodstreams forms of *Trypanosoma brucei gambiense*

Truc P.*, Kohagne Tongué L. & Lekane Likeufack A. C.

Organisation de Coordination pour la lutte contre les Endémies en Afrique Centrale (OCEAC), BP 288 , Service « Trypanosomiase Humaine Africaine », Laboratoire d'étude de la Chimiosensibilité des trypanosomes, Yaoundé, Cameroun

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Drug sensitivities *in vitro* assays are usually performed for african trypanosomes using the commercial drugs (Pentamidine, Germanin, Ornidyl, Lampit, Arsobal, Bérénil). However, no study has been done for evaluate the fluctuation of *in vitro* activity of drugs depending of batches, storage conditions, quality of active molecules and the presence of excipents. In order to propose a standardization of techniques, a comparative study of *in vitro* assays was performed for reference stocks of trypanosomes when using the commercial drug and the pure active molecules. For instance, some results show significant differences of MIC determinations when using DFMO or Ornidyl, as for example R015 strain while no significant difference was observed for other drugs. Other results for diamidines, storage and excipients are discussed. For standardization and reliabiltiy of MIC determinations, use of pure active molecule provided by SIGMA or an other Compagny must be considered as standart for comparing results obtained by different laboratories.

Efficacité et sécurité du DB 289, un nouveau médicament oral pour le traitement de la maladie du sommeil au stade précoce: étude ouverte et non contrôlée de phase IIa,

Christian Burri[1], Patrick D. Yeramian[2], James L. Allen[2], Richard R. Tidwell[3], Ada Merolle[1], Serge Kazadi Kyanza[4], Pascal Lutumba Tshindele[4], Constantin Miaka Mia Bilenge[4], Francisco Manuel[5], Théophilo Josenando[5] & Gabriele Pohlig[1]

[1]Swiss Tropical Institute, Swiss Center for International Health, Basel, Switzerland; [2]Immtech International, Inc., Vernon Hills IL, USA; [3]University of North Carolina, Department of Pathology, School of Medicine, Chapel Hill NC, USA; [4]Programme Nationale de Lutte contre la Trypanosomiase Humaine Africaine, Kinshasa, R.D. Congo; [5]Instituto de Combate e de Controlo das Tripanossomíases, Luanda, Angola

La pentamidine, le médicament de choix actuel pour le traitement du stade précoce de la maladie du sommeil à *T.b. gambiense,* a des limites i.e. inefficace per os, élimination lente et toxicité. Une recherche intensive a été menée pour développer d'autres dications aromatiques possédant un large spectre antimicrobien, une toxicité réduite et des propriétés pharmacocinétiques améliorées. Le DB289 est la prodrogue utilisable per os du DB75, une diamidine diphénylfurane originale qui montre une activité trypanocide in vitro pour les trypanosomes africains et in vivo dans les modèles animaux pour la trypanosomiase.

Nous présentons ici les résultats d'une étude ouverte et non contrôlée de phase IIa pour évaluer la sécurité et l'efficacité du DB289 chez des malades au stade précoce de la trypanosomiase à *T.b. gambiense*. Tous les malades avaient 16 ans ou plus et avaient un poids minimum de 45 kilos. Ils avaient tous des parasites (*T.b. gambiense*) présent dans le sang ou dans la lymphe, mais absent du LCR. Ces patients ont été traités avec 100mg de DB289 per os deux fois par jour pendant 5 jours. Tous ont été hospitalisés pendant 144 heures après administration et ont subit un suivi régulier pour la possible apparition de signes et symptômes due au traitement. Ce suivi incluait un ECG, des tests hématologiques, la biochimie du sang et le contrôle des urines.

Quatre malades ont été inclus dans l'étude en Angola et 28 en République Démocratique du Congo. Deux jours après la fin du traitement, les parasites avaient disparus du sang et de la lymphe chez tous les malades à l'exception de 2. A ce jour 21/27 malades prévus pour leur suivi de 6 mois ont été examinés et une rechute était détectée. Aucune rechute n'a été observée. L'analyse pharmacocinétique a montré que l'équilibre médicamenteux dans le sang était maintenu au dessus des concentrations minimales inhibitrices pendant toute la période du traitement.

Deux malades ont été éliminés de l'étude due respectivement à une hypertension et une hyperthermie persistante.

De façon générale, le traitement a été très bien toléré, les autres effets secondaires étaient des céphalées, des fièvres intermittentes et du prurit. En dehors d'une faible augmentation des enzymes hépatiques (AST, ALT) chez quatre malades suite au traitement, il n'y avait aucune anomalie dans les analyses de laboratoire. Un examen préliminaire des ECG montre une absence d'altérations cliniques significative due au traitement

Efficacy and safety of DB 289, a new oral drug for treatment of first stage sleeping sickness: an open-label, non-controlled Phase IIa trial

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Pentamidine, the current drug of choice for treating first stage *T.b. gambiense* sleeping sickness, has limitations, e.g. inactivity when dosed orally, slow elimination and toxicity. Intensive research has been conducted to develop alternative aromatic dications with broad antimicrobial spectrum, reduced toxicity and improved pharmacokinetic properties. DB289 is the orally applicable prodrug of DB75, a novel diphenylfuran diamidine, shown to be active *in vitro* against African trypanosomes and in animal models for trypanosomiasis.

We present results from an open-label, non-controlled Phase IIa study to evaluate the safety and efficacy of DB289 in patients with first stage *T.b. gambiense* sleeping sickness. Patients were 16 years or older with a minimal weight of 45 kilograms and had *T.b. gambiense* present in blood and/or lymph but not in CSF. Patients were treated with 100 mg of DB289 orally twice a day for 5 days. Patients were hospitalized for 144 hours post dose and underwent regular follow-up for possible treatment-emergent signs and symptoms, including ECG, hematology, biochemistry and urine testing.

Four patients were enrolled in Angola and 28 in the Democratic Republic of Congo. All but 2 patients were parasite free in blood and lymph 2 days after completion of treatment. 21/27 patients due for follow up have returned for the 6-month evaluation so far and one relapse has been detected. Pharmacokinetic analysis has shown that steady-state trough drug levels in blood were maintained above the Minimal Inhibitory Concentration during treatment.

Two patients were withdrawn from the study due to high blood pressure and persistent high fever, respectively. Altogether, tolerance was excellent, other adverse events being headache, intermittent fever and pruritus. Apart from a mild increase in liver enzymes (AST, ALT) after treatment in 4 patients, there were no laboratory anomalies. Preliminary review of the ECGs showed the absence of treatment emergent changes of clinical significance.

Title: Association between melarsoprol-related Encephalopathic Syndromes during treatment of human African trypanosomiasis and HLA type: preliminary communication.

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Background:
Encephalopathic syndromes (ES) are poorly defined and unpredictable life-threatening events that occur during treatment of human African trypanosomiasis (HAT) with melarsoprol. The frequency of ES is about 2-10% and the mortality from ES averages 50 %. ES is generally assumed to be an immune phenomenon. The Human Leukocyte Antigen (HLA) complex is a major determinant of individual immune response.

Objectives:
To prospectively investigate clinical factors associated with ES.
To improve the clinical definition and management of melarsoprol-related ES.
To investigate the existence of an association between ES and the HLA complex.

Methods:
A prospective, case-controlled, non-blinded, non-randomized study, comparing patients in late stage HAT treated with melarsoprol and developing or not an encephalopathic syndrome was designed. Adequate study sample size was estimated at 100 ES cases with 300 controls.
A case report form was created to prospectively collect standardized clinical data from every late stage patient treated with melarsoprol. In addition clinical characteristics of the ES episode and interventions for the prevention and management of ES are recorded. Capillary blood is collected into a special filter paper and HLA typing is performed by PCR-SSOP methods.

Results:
The study was implemented in 5 HAT treatment centers in Angola and in the Democratic Republic of Congo (DRC) in June and August 2002, respectively.
As of April 2003, a total of 38 ES cases (with their controls) corresponding to the definitions set for the study have been enrolled and 4 cases were excluded. All patients were treated with the concise 2.2 mg/kg 10 days schedule. The observed ES episodes consisted mainly of convulsion(s) followed by coma. ES with exclusively mental changes were not observed. HLA Class I typing of the first 43 samples showed ambiguities in 12 instances. Typing for HLA Class II and clinical data processing is ongoing.

Titre: Association entre les Syndromes Encéphalopatiques en rapport avec le mélarsoprol lors du traitement de la trypanosomiase humaine Africaine et le type de HLA: communication préliminaire.

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Encadrement:
Les syndromes encéphalopathiques (SE) sont un événement neurologique sérieux, imprévisible et souvent mortel, en rapport avec le traitement de la trypanosomiase humaine africaine (THA) au mélarsoprol. La fréquence du syndrôme est de 2-10% et la mortalité du SE atteint en moyenne 50%. Il est généralement accepté que cette réaction sévère est un phénomène immunologique. Le complexe des antigènes leucocytaires humains (HLA) est un déterminant majeur de la réponse immunologique individuelle.

Objectifs:
Enquêter sur les facteurs cliniques associés au SE.
Améliorer la définition clinique et la prise en charge du SE en rapport avec le mélarsoprol.
Enquêter sur l'existence d'une association entre le SE et le complexe HLA.

Méthodes:
Une étude prospective, cas-témoin, non-aveugle, non-randomisée, qui vise comparer des malades en deuxième période de THA, traités au mélarsoprol, et qui développent ou non un syndrome encéphalopathique a été conçue. La taille adéquate de l'échantillon a été estimée à 100 cas de SE avec 300 témoins.
Un formulaire d'observation a été créé pour rassembler de forme standardisée les données cliniques de chaque malade en deuxième période traité au mélarsoprol et les caractéristiques cliniques de l'épisode de SE, ainsi que les interventions pour sa prévention et prise en charge sont enregistrées. Du sang capillaire est prélevé sur du papier filtre spécial et le typage HLA est exécuté par des méthodes de PCR-SSOP.

Résultats:
L'étude a été mise en place dans 5 Centres de traitement de la THA en Angola et dans la République Démocratique du Congo juin et août 2002.
Jusqu'au mois d'avril 2003, un total de 38 cas de SE (avec témoins) avaient été recrutés, correspondant aux critères définis pour l'étude, et 4 cas ont été exclu. Tous les malades ont été traités avec le schéma concis de 2.2 mg/kg en 10 jours. Les épisodes de SE observés ont consisté surtout en convulsion(s) suivie(s) de coma. Des SE à caractéristiques exclusivement mentales n'ont pas été observées. Le typage HLA de Classe I des premiers 43 échantillons a montré des ambiguïtés dans 12 déterminations. Le typage de HLA Classe II et le traitement des données cliniques sont en cours.

Evaluation of the efficacy of the diamidine DB289 in the treatment of late stage *Trypanosoma brucei rhodesiense* infections in mice

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Following successful treatment of early stage *Trypanosoma brucei rhodesiense* trypanosomosis in mice with the novel prodrug 2,5-bis(4-aminophenyl-furan-bis-O-methylamidoxine DB289), further trials were carried out in mice in late stage disease. Late stage disease developed when mice infected by intraperitoneal injection with approximately 10^4 *T b rhodesiense* KETRI 2537 were maintained for prolonged durations before treatment. Each experimental group comprised of six animals. The mice were treated on day 21 post infection with DB289 both orally (PO) and intraperitoneally (IP) at various dosages between 6.25 and 50mg/kg body weight for five and four days respectively. The mice were monitored for 60 days post treatment. At 25mg/kg administered orally, 75% (¾) of the mice were cured but 25% relapsed with infection 55 days post treatment. All mice treated at 25mg/kg IP, and both IP and PO at 50mg/kg were cured. The results indicate that DB289 is effective against late stage trypanosomosis in mice. DB289 comes as an oral presentation, which has an overriding advantage because it removes the need for hospitalisation of patients. Experimental trials carried out in this laboratory in vervet monkeys have had mixed results after oral treatment. The major pitfall in the mouse model is based on the different metabolic rates and pharmacology of drugs in small animals as compared to the humans. That there was activity against late stage parasites in the smaller vertebrate gives rise to optimism that better activity in the monkey model is possible. Further trials aimed at increasing the drug concentration in the CNS through variation of the current dosing procedures and protocols are therefore recommended.

Improvement of the vervet monkey model of Rhodesian sleeping sickness at KETRI using a clone of trypanosome

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A field stabilate of *Trypanosoma brucei rhodesiense* (KETRI 2537) has been used as the standard parasite for the vervet monkey model of sleeping sickness established at the Kenya Trypanosomiasis Research Institute (KETRI). Although the model has been very successful, a number of variations in the clinical and pathological parameters have been reported. As a way of improving the model, the use of a clone of the original stabilate has been recommended. The present study was undertaken to compare the disease pattern in

mice infected with the original standard isolate and its clone (KETRI 3741). Two groups of mice were infected by intraperitoneal injection with 10^4 parasites of either KETRI 2537 or KETRI 3741. The parasitaemia was monitored daily on wet smears of tail blood and changes in parasite morphology studied on Giemsa stained blood smears. The mice were euthanised in groups of five at 7, 14, 21 and 28 days post infection (DPI) and samples taken from major organs for histopathology. Two other groups of mice were allowed to run with the disease in order to determine the virulence of the parasites. The infection resulted in a mean prepatent period of 3 (range 3-4) days for KETRI 2537 and 4 (range 3-5) days for KETRI 3741. The first wave of parasitaemia for both isolates reached peak (antilog 8.7) between 6-8 DPI and was followed by secondary latency. Thereafter, the parasitaemia increased and remained elevated, with slight fluctuations. The clone retained the pleomorphism observed in the original isolate. The cumulative mortality rate in mice infected with the field stabilate KETRI 2537 was higher than in the clone, with the latter isolate surviving longer. By 45 DPI, all the mice infected with KETRI 2537 and only 63% (5/8) of the ones infected with the clone had died. At post mortem there were no observable differences in the organs from both groups. Mice infected with the clone had relatively fewer histopathological changes, especially in the liver, spleen and brain. Severe meningoencephalitis was however observed in mice infected with the clone that died after 77 DPI. The pathogenicity of the two parasites would therefore appear to be similar, although the clone caused a more chronic disease. These studies indicate that it may be possible to establish a more stable primate model of sleeping sickness using the clone. Late stage disease might also be established without having to treat sub curatively with diminazene aceturate.

The safety of DB289, a novel drug for the treatment of sleeping sickness, in vervet monkeys

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The safety of 2,5-bis (4-amidinophenyl)-furan-bis-O-methylamidoxime (DB289), an orally active pro-drug being tested for the chemotherapy of sleeping sickness and leishmaniasis, was assessed in the vervet monkey (*Cercopithecus aethiops*) model of sleeping sickness. It was administered at 10mg/kg-body weight for 10 consecutive days to two normal vervets. Thereafter, the monkeys were observed for overt signs of toxicity on a daily basis. Detailed physical examination and collection of blood plasma samples was carried out at various pre-determined time intervals before, during and following application of the drug. At the end of the sampling period, the plasma samples were analysed for the activity of lactate dehydrogenase (LDH), aspartate aminotransferase (AST), creatine kinase (CK) and the concentration of total proteins, albumin and globulins, to assess tissue damage. The VetTest 8008 analyser system was used for the analysis. All the monkeys showed no significant changes in clinical appearance, feeding, body secretions and stool formation. However, the activities of LDH, AST and CK were significantly elevated, with mean peak levels of 1788, 162, 3504 IU respectively attained 24-48 hours after the treatment. The changes in enzyme activities were transient, and normal pre-treatment levels were re-established within seven days. Changes in the concentration of total proteins, albumin and globulins were not correlated to the administration of the prodrug. DB289 was therefore well tolerated in vervet monkeys and is hence recommended for efficacy tests in this monkey model of sleeping sickness.

Efficacy of pentamidine and two novel dicationic diamidines, DB75 and DB289 against acute murine *Trypanosoma brucei rhodesiense* infections

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Pentamidine (Lomidine®), a drug used in the chemotherapy of early stage *Trypanosoma brucei gambiense* infections in man, has been considered ineffective against *T.b. rhodesiense* infections. However, there is scarcity of information on which this clinical practice is based. Consequently, the drug and two recently synthesised "pentamidine like" dicationic diamidines, 2,5-bis (4-amidinophenyl)furan (DB75) and its orally active 2,5-bis (4-amidinophenyl)-furan-bis-O-methylamidoxime (DB289) pro-drug, were evaluated for efficacy against early stage *T. b. rhodesiense* KETRI 2537 infection in mice. Swiss white mice weighing 20-30g at the beginning of the experiment were intraperitoneally inoculated with 10^4 trypanosomes contained in 0.2ml of phosphate saline glucose (PSG). At the onset of parasitaemia, confirmed by microscopy of wet smears of tail snip blood, groups of six mice were intraperitoneally treated with pentamidine at 12.5, 6.25, and 3.13mg/kg body weight for four consecutive days. DB75 was adminstered at 50, 25, 12.5, 6.25, 3.13, 1.56, and 0.78mg/kg body weight once a day for four days intraperitoneally. DB289 was administered orally (5 days) and intraperitoneally (4 days) using dose rates similar to DB75. The mice were monitored for parasitaemia three times a week for at least 60 days before cure was declared. DB289 was curative at dose rates above 6.25mg/kg body weight, irrespective of the route of drug administration. DB75 was equally effective, with a CD_{75} of 0.78mg/kg body weight. Contrary to expectations, pentamidine was also effective, attaining a CD_{80} of 6.25mg/kg body weight. This work shows that both DB75 and DB289 have a high efficacy against early stage *T.b. rhodesiense* infections in mice and are therefore a promising new treatment for early stage Human African Trypanosomosis (HAT). The study recommends a re-evaluation of guidelines for the clinical use of pentamidine and "pentamidine-like" compounds in the treatment of early stage HAT.

DETERMINATION OF THE POTENTIAL USE OF COMMUNITY-BASED ORGANISATIONS IN THE DISSEMINATION OF SLEEPING SICKNESS INFORMATION IN WESTERN KENYA

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ABSTRACT

Successful sleeping sickness control in Africa has been hampered by low level of awareness, within the affected communities, among other factors. Dissemination of correct information and effective utilisation by the affected communities would be a major weapon for the control of the disease, providing the means of encouraging appropriate and informed decisions towards sleeping sickness. Various countries have used different channels of communication in the past but they have not been sustainable. Utilisation of existing community-based organisations has been widely recognised as one of the ways of ensuring sustainability of tsetse control and disease surveillance. The aim of the present study was to assess and document the organisational structures and capacity of identified groups in Busia with a view of using them as entry and dispersal points for tsetse and trypanosomosis control. Focus group discussions and key informant interviews were held with members of different organisations to find out the historical profiles, goals and missions, composition of the groups, their impact on the community and their experience with tsetse and trypanosomosis. A qualitative approach was used in analysing the data. A total of 32 groups, engaged in various income-generating activities, were interviewed. The level of awareness of some of the group members in terms of tsetse and trypanosomosis was found to be low. The common methods of tsetse and trypanosomosis control known by some of the groups were bush clearing, use of impregnated nets, chemotherapy, spraying and pour-on. Groups that were internally initiated seemed to be more active and sustainable than groups that were externally initiated. The groups use field days, *barazas*, church meetings, market places, and posters, among others, to pass information to the rest of the community. Thus, these groups can be resourceful in terms of information dissemination since they have good linkages with the wider community.

Differential sensitivity of cerebrospinal fluid and blood relapse *T. b rhodesiense* to DB75, an anti-trypanosomal compound

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An investigation was carried to determine the differences in sensitivity of blood and cerebrospinal fluid (CSF) relapse *Trypanosoma brucei rhodesiense* following treatment with a diamidine. Trypanosomes that had relapsed in the CSF and blood of vervet monkeys following oral treatment in the second stage of *rhodesiense* sleeping sickness with a novel diamidine compound 2,5-bis (4-amidinophenyl)-furan-bis-O-methlylamidoxime (DB289) were tested for sensitivity in mice. Their sensitivity was compared to that of the original isolate. The CSF relapse trypanosomes were sub-inoculated into donor mice (irradiated) 60 days after relapse while the blood relapse trypanosomes were sub-inoculated into donor mice (irradiated) 30 days after relapse. Groups of experimental mice were infected with the relapsed trypanosomes or the original isolate (KETRI 2537) at an inoculum of 10^4. At the onset of parasitaemia the mice were treated intraperitoneally with various dose rates of DB75, the active metabolite of DB289. The mice were monitored for 60 days. The pre-patent periods of the original isolate, the CSF relapse and blood relapse trypanosomes were 3.98±0.02 days, 3.01±0.03 days and 4.09±0.05 days (mean ±SE) respectively. At the lowest dose rate of the drug used (1.56 mg/kg b.w), 67% and 45% mice infected with the original and the CSF relapse trypanosomes were cured. At the dose rate of 3.125mg/kg, 100% and 92% of mice infected with the original and the CSF relapse trypanosomes were cured. None of the mice infected with the blood relapse trypanosomes were cured when treated at the dose rate of 6.25 mg/kg and below. At the highest dose rate (25mg/kg) used, only 67% of the mice infected with the blood relapse trypanosomes were cured. The results indicate similarities in the sensitivity of the relapsed CSF trypanosomes and the original blood isolate to DB75 and a significant difference ($p<0.001$) in sensitivity between the two sub-populations and blood relapse trypanosomes. It would appear that the relapse of infection in the CNS might be due to inaccessibility of the drug to some sites in the brain where trypanosomes are hiding and/or due to inadequate drug levels. The reduced sensitivity of the relapsed blood trypanosomes would suggest that either the source of the relapse in the blood is other body organ tissues or that after the CSF relapse trypanosomes have crossed back into the blood the sensitivity of these trypanosomes was affected by prolonged exposure to immunological systems in the blood and/or sub-curative drug levels. This needs to be investigated further.

Occurrence, clinical manifestation and the epidemiological implications of naturally occurring canine trypanosomosis in western Kenya

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[1]**Abstract**

Domestic dogs were screened for *Trypanosoma brucei* infection using the haematocrit centrifugation technique as part of routine active surveillance exercises in the Busia and Teso districts of Kenya. The purpose was to assess the role of dogs as sentinels for the occurrence of human sleeping sickness. Out of 200 dogs screened at the various test sites, five of them were found to be infected with trypanosomes. These five succumbed to the disease within four weeks of initial infection, and exhibited a distinct and pronounced corneal opacity before death. Blood samples from two naturally infected dogs were tested for the presence of the serum resistance associated (SRA) gene and one tested positive, indicating that it was potentially human infective (*T. brucei rhodesiense*) prevalence (0.5 %). It is considered that the occurrence of corneal opacity could be used as an early warning prediction of future sleeping sickness outbreaks. This type of prediction could form an integral part of indigenous technical knowledge set in areas lying at the edges of the tsetse (*Glossina spp.*) belts where *T. brucei* is the main trypanosome species that affects dogs. The occurrence of corneal opacity in dogs could indicate presence of *T. brucei,* a proportion of which could be human infective *T. b. rhodesiense* circulating in the population before disease outbreak occurs. It is predicted that during sleeping sickness epidemics the domestic dog would be the first casualty, rapidly succumbing to disease long before it is noticed in man. Prompt prediction of disease outbreaks would thus enable early interventions that would reduce the morbidity, mortality and the general economic losses associated with sleeping sickness to be instituted.

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CHOIX D'UNE STRATEGIE DE DEPISTAGE POUR LA TRYPANOSOMIASE HUMAINE AFRICAINE (THA).

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Introduction

Plusieurs programmes ont remplacé la palpation ganglionnaire comme méthode de dépistage par le Card Agglutination Test for Trypanosomiasis (CATT). D'autres comme le RD Congo par contre combinent les deux.

Ce travail examine les rapports coût-efficacité et temps-efficacité de ces stratégies.

Méthodologie

La stratégie de palpation ganglionnaire (PG) est comparée à celle du CATT et à celle combinant les deux (PG-CATT).

L'efficacité est calculée en nombre de vrais THA détectés et soignés. Le coût et le temps personnel sont calculés par individu participant au dépistage. L'efficience est calculée sur base du rapport coût-efficacité et temps-efficacité.

La comparaison inclut les étapes du diagnostic et traitement. La sensibilité et spécificité des examens parasitologiques combinés (PG,SF,GE) utilisées sont respectivement 70% et 100% et celle du CATT de 90% et 96,5% et le taux de guérison de 90%.

Résultat

1.Efficacité: La stratégie combinée PG-CATT guérit 601 patients sur 1000 , la CATT 561 et la PG 408 dans une population de 100 000 avec une prévalence de 1%.

2. Coût: La stratégie CATT coûte 0.70 U$ par personne participant au dépistage, la combinée 2,71 et la PG à 2,11.

3. Temps: La stratégie CATT prends 91 secondes par personne participant au dépistage; la PG 357 et la combinée 432 .

4. Rapport coût-efficacité: La stratégie CATT revient à 125 U$ par cas guéri ; la combinée à 452 et la PG à 517.

5. Rapport temps personnel-efficacité: La stratégie CATT prends 16 150 secondes par cas guéri; la combinée 71 944 et la PG 87 611.

Après l'analyse de sensitivité, les résultats de comparaison ne changent pas.

Conclusion

La stratégie CATT est la moins coûteuse et la plus efficiente.

Le temps et l'argent récupérables peuvent être réalloué pour améliorer éventuellement la performance du diagnostic ; augmentant ainsi le nombre des patients détectés et traités.

CHOICE OF STRATEGY OF SCREENING FOR HUMAN AFRICAN TRYPANOSOMIASIS (HAT).

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Introduction

Several programs replaced lymph node palpation like method of screening by Card Agglutination Test for Trypanosomiasis (CATT). Others as the DR Congo combine both. This work examines the cost-effectiveness and time-effectiveness of these strategies.

Methodology

The lymph node strategy (LN) is compared with CATT and the combined strategy (LN-CATT). Efficacy is calculated as the number of detected and treated true HAT. Cost and personnel time are calculated for each individual taking part in screening. Effectiveness is calculated on the basis of time-effectiveness and cost-effectiveness. The comparison includes diagnosis and treatment. The sensitivity and specificity of the combined diagnosis method used for this study are respectively 70% and 100% , those of the CATT are 90% and 96.5% and the cure rate is 90%. .

Result

1. Efficacy: In a population of 100 000 with a prevalence of 1%, out of 1000 patients, the combined strategy LN-CATT cured 601 patients, the CATT strategy 561 and the LN strategy 408.
2. Cost: CATT strategy cost 0.70 U$ per person taking part in screening, combined strategy 2.71 U$ and LN 2.11 U$.
3. Time: CATT strategy took 91 seconds per person taking part in screening, LN 357 seconds and the combined strategy 432 seconds.
4. Cost-effectiveness: CATT strategy cost 125 U$ per case cured, combined strategy 452 U$ and PG 517 U$.
5. Personal time-effectiveness: CATT strategy took 16 150 seconds per case cured, combined strategy 71 944 seconds and PG 87 611 seconds.

The results of comparison did not change, after sensitivity analysis.

Conclusion

The CATT strategy is the least expensive and most efficient. Time and money recovered can be used to improve the performance of the diagnosis, increasing the number of patients detected and treated.

Production de la "mini anion exchange centrifugation" (mAECT) kit à Kinshasa (R.D. Congo) pour le diagnostic de la maladie du sommeil

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Le diagnostic de confirmation de la Trypanosomiase Humaine Africaine est obtenu par la détection du parasite dans la lymphe, le sang ou parfois le liquide céphalorachidien. Particulièrement dans la forme chronique de la maladie du sommeil (*T.b. gambiense*), la parasitémie souvent reste en dessous de la limite de détection des examens sur sang frais ou sur goutte épaisse. Une meilleure sensibilité est obtenue par des techniques de concentration comme la centrifugation en tubes capillaires et la mAECT.

mAECT est basée sur la séparation des trypanosomes du sang sur une colonne échangeuse d'anions. mAECT à été introduite sur le terrain dans les années 1970. Historiquement, ce test était produit au Projet de Recherches Cliniques sur la Trypanosomiase à Daloa, Côte d'Ivoire. Plus tard, l'Institut Pierre Richet à Bouaké, Côte d'Ivoire, a également commençé la production. Pour différentes raisons, l'obtention de la mAECT s'avérait difficile. Sur demande du Programme National de la Lutte contre la Trypanosomiase Humaine Africaine en R.D. Congo, l'Institut de Médecine Tropicale et l'Institut National de Recherches Biomédicales (INRB) ont développé un nouveau modèle de mAECT et ont installé une unité de production à l'INRB (Kinshasa, R.D. Congo). Particulièrment la standardisation de la production, la qualité du produit et la formation du personnel ont été considérées. A ce jour, la mAECT peut être obtenue directement de l'INRB à 2 USD/test (prix 2003).

Production of the mini anion exchange centrifugation (mAECT) kit in Kinshasa for diagnosis of sleeping sickness

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Confirmation diagnosis of Human African Trypanosomiasis is obtained by detection of the parasite in lymph node fluid, blood and sometimes cerebrospinal fluid. Particularly in the chronic form of sleeping sickness (*T.b. gambiense*), parasitaemia is often below the detection limit of wet blood film or thick blood smear. Improved sensitivity is obtained by concentration techniques such as capillary centrifugation and the even more sensitive mAECT.

mAECT is based on the separation of trypanosomes from the blood on an anion exchanger column. mAECT has been introduced since the 1970s in the field. Historically, this test was produced at the Projet de Recherches Cliniques sur la Trypanosomiase in Daloa, Côte d'Ivoire. Later, also Institut Pierre Richet in Bouaké, Côte d'Ivoire, started a production unit. For several reasons, the purchase of the test from these production sites remained difficult. On demand of the Programme National de la Lutte contre la Trypanosomiase Humaine Africaine of R.D. Congo, the Institute of Tropical Medicine and the Institut National de Recherches Biomédicales (INRB) developed an improved model of the mAECT and established a production unit at INRB in Kinshasa, R.D. Congo. Special attention has been given to the standardization of the production process, quality control of the product and training of the personnel. The mAECT kit can currently be purchased directly from INRB at 2 USD/test (price 2003).

Isolement amélioré de *Trypanosoma brucei gambiense* dans le rat d'arbre *Grammomys surdaster.*

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La Trypanosomiase Humaine Africaine est due à l'infection des protozoaires *Trypanosoma brucei gambiense* et *T.b. rhodesiense*. Historiquement, un taux d'échec de traitement de 5% est observé chez les patients traités au Mélarsoprol, un dérivé arsénical utilisé pour le traitement de patients trypanosés en stade avançé. Récemment, des taux de rechute jusque 30% ont été notés dans certains foyers à *T.b. gambiense* en Angola, au Soudan et en Ouganda. En conséquence, l'OMS a créé le "Network on Treatment Failure and Drug Resistance in Sleeping Sickness". Un des objectifs est d'améliorer l'isolement de souches de *T.b. gambiense* à partir des cas de rechute afin de les tester sur leurs résistance aux médicaments et d'étudier les méchanismes qui mènent à cette résistance.

Les techniques actuelles d'isolement de *T.b. gambiense* souffrent d'un taux de succès bas et nécessitent de longues périodes d'adaptation pour obtenir des parasitémies suffisantes. D'habitude, des rongeurs sont inoculés avec le sang ou le liquide céphalorachidien d'un patient, suivi par des subinoculations pour adapter le parasite afin d'obtenir des parasitémies suffisamment hautes dans peu de jours après inoculation. A ce jour, le meilleur récipient pour *T.b. gambiense* est le rat *Mastomys natalensis* avec lequel on peut obtenir des taux de succès d'environ 50%.

Dans le cadre du Network de l'OMS, *Grammomys surdaster* a été étudié comme récipient potentiel pour l'isolement amélioré de *T.b. gambiense*. *G. surdaster* (*Thamnomys surdaster*) est un rat d'arbre qui vit dans les forêts de montagne en Afrique Centrale. Des infections expérimentales comparatives démontrent clairement que *T.b. gambiense* est plus virulent dans *G. surdaster* que dans des souris Swiss et des rats Whistar. Des inoculations de ces mêmes espèces de rongeurs avec le sang et le liquide céphalorachidien de patients à Kinshasa (R.D. Congo) confirment la susceptibilité de *G. surdaster* pour *T.b. gambiense*, comparée aux rats et souris de laboratoire.

Improved isolation of *Trypanosoma brucei gambiense* in the thicket rat *Grammomys surdaster*.

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Human African Trypanosomiasis is caused by the protozoan *Trypanosoma brucei gambiense* and *T.b. rhodesiense*. Historically, a treatment relapse rate of about 5% has been observed in patients treated with Melarsoprol, an arsenical derivate used for treatment of both *gambiense* and *rhodesiense* late stage sleeping sickness. More recently, relapse rates up to 30% have been noted in some *gambiense* sleeping sickness foci in Angola, Sudan and Uganda. Therefore, WHO established a Network on Treatment Failure and Drug Resistance in Sleeping Sickness. One of its objectives is to improve isolation of *T.b. gambiense* strains from treatment relapse cases for drug sensitivity testing and for research on drug resistance mechanisms.

Techniques for *T.b. gambiense* isolation suffer from low success rates and long adaptation periods needed to propagate the parasite in sufficient numbers. Usually, rodents are inoculated with the patient's blood or cerebrospinal fluid and subpassaged until the strain becomes sufficiently adapted to yield high parasitemia within few days after inoculation. Until now, the best recipient for *T.b. gambiense* is the *Mastomys natalensis* rat, with a success rate of about 50%.

Within the framework of the WHO Network, *Grammomys surdaster* was investigated as a potential recipient for improved isolation *of T.b. gambiense*. *G. surdaster* (former *Thamnomys surdaster*) is a thicket rat from mountain forests of Central Africa. Comparative experimental infections of Swiss mice, Whistar rats and *Grammomys* rats with *T.b. gambiense* clearly show that this trypanosome grows faster in *Grammomys* rats. Inoculation of the same rodent species with patient's blood and cerebrospinal fluid in Kinshasa (R.D. Congo) confirms the observation that the ticket rats are more susceptible to *T.b. gambiense* infection than typical laboratory rodents.

LUTTE CONTRE LA TRYPANOSOMIASE HUMAINE AFRICAINE DANS LE FOYER DE LA MANDOUL, TCHAD : APPORT D'UNE COOPERATION TECHNIQUE INTERNATIONALE

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Le foyer de trypanosomiase humaine africaine (THA) de Bodo, au sud du Tchad, est connu depuis 1993. De 1993 à 2001, des actions ponctuelles, conduites par le programme national de lutte contre la THA (PNLTHA), et un dépistage passif dans les rares structures sanitaires locales ont permis le diagnostic et le traitement de 100 à 200 cas annuels.

En 2002, un effort particulier est décidé sur ce foyer que l'on pressentait beaucoup plus actif. Il est très vite apparu que le PNLTHA ne pouvait à lui seul assurer le travail. Dans chacune des prospections, il a alors été renforcé par des techniciens venus de RD Congo, de Guinée Equatoriale et du Cameroun.

En février 2002, une première prospection permet de diagnostiquer 73 malades sur 1 325 habitants de 3 villages (5.5 %). En avril, 5 633 habitants de 13 villages sont examinés et 138 malades diagnostiqués (2.5 %). En novembre, une prospection de l'ensemble du foyer de Bodo, sur la rive gauche de la rivière Mandoul, est organisée : 16 273 personnes sont examinées et 361 malades diagnostiqués (2.2 %), la cartographie épidémiologique du foyer est dressée, le rôle majeur de la Mandoul établi, ce qui conduit à un changement de nom du foyer.

En avril 2003, 3 116 habitants de 9 villages de la rive droite de la Mandoul et d'un campement de nomades Bororos sont examinés et 82 malades diagnostiqués (2.6 %).

Dans la même période, de janvier 2002 à mars 2003, 139 malades supplémentaires sont diagnostiqués passivement et ce sont donc 793 malades au total qui ont été diagnostiqués et traités en 14 mois dans ce foyer.

Pour la première fois le foyer de la Mandoul a été prospecté dans son ensemble. Il faut souligner l'importance de l'assistance apportée au PNLTHA du Tchad par des experts venus des pays avoisinants : en plus de l'expertise technique fournie, ils ont pu former sur le terrain les jeunes techniciens et infirmiers nouvellement affectés au PNLTHA du Tchad et réaliser ainsi un modèle de coopération au niveau international dans la lutte contre la maladie du sommeil.

Genetic predisposition to Human African Trypanosomosis (HAT): polymorphisms of TNF-α and IL-10 genes promoters are associated with the disease

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Despite the importance of behavioural and environmental risk factors there are some arguments, in both animal models and human studies, consistent with the existence of an individual susceptibility to the HAT.

In humans, the available means to identify the role of genetic factors in the expression of complex diseases combine epidemiological data (behavioural and environmental risk factors) and genetic information.

Among them, association studies are interested in the distribution of a particular gene polymorphisms between affected and unaffected subjects taking into account behavioural and environmental risk factors. These methods has led to major advances in the identification of host genes involved in human susceptibility to malaria and schistosomosis.

Our objective was to study the role of IL-10, IL-4, IL-2 and TNF-α gene DNA polymorphisms in HAT. These cytokines are strongly involved in the immune response to the disease. Two complementary association studies have been performed: a Classical Case Control study and a Transmission Desequilibrium Test (TDT) to avoid population admixture or incomparability between cases and controls. Genetic markers used are Single Nucleotid Polymorphisms (SNPs).

Our results showed a significant association between two polymorphisms and the disease (one at the –308 base pairs to the promoter of TNFα gene and the second one at position –592 of the IL10 gene promoter). Individuals homozygous for the mutation located in the TNFα promoter are predisposed to HAT. Concerning IL10 polymorphism, both homozygous and heterozygous subjects have an increased risk to develop the disease.

These findings are consistent with immunological reports concerning the role of these cytokines in HAT and allow to formulate assumptions about the role of these genetic defects in immune response regulation. Moreover, this SNP at nucleotide -308 relative to the transcriptional start site has been associated with susceptibility to severe malaria and leishmaniasis, emphasizing the putative involvement of this polymorphism in the control of several parasitic infections.

Comparative performance of CATT and CIATT in the diagnosis of *T.b.gambiense* in Adjumani district, north west Uganda

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Abstract

This study aimed at comparing the sensitivity, specificity and predictive values of Card Indirect Agglutination Test for Trypanosomiasis (CIATT) with Card Agglutination Test for Trypanosomiasis (CATT) in detecting *T.b.gambiense* in a clinical setup. Persons in 17 villages in Adjumani district, north west Uganda, were screened using HCT, CATT and CIATT for sleeping sickness. A total of 2,049 sleeping sickness suspects were tested of whom 409 (19.9%) suspects were CATT and or CIATT positives and 9 persons were parasitologically confirmed as sleeping sickness cases by HCT and were referred to Adjumani district hospital for treatment. Out of the 9 parasitologically confirmed sleeping sickness cases, 3 were CATT negative in whole blood, but CIATT positive in whole blood and one case was CIATT negative and CATT positive in whole blood. If CATT was used alone, as it is normally done, then these 3 cases would have been missed and sent back to the villages to maintain infection. This confirms the previous finding that CATT misses some sleeping sickness cases in north west Uganda. Also if CIATT is to be used alone then some cases will be missed as has already been shown in this study. Seroprevalence based on each test alone was 11.2% for CATT and 15.5% for CIATT, which are quite close to each other. However, when the results of the two tests were combined the seroprevalence was 19.9%, which is higher than the individual prevalences for each test. Prevalence of sleeping sickness based on HCT was 0.20%, which is much lower than sero-pevalances. The relative sensitivity of CATT alone was 66.7% while that of CIATT was 88.9%, indicating that CIATT was more sensitive than CATT. However, the relative specificity of CIATT alone was 84.8% while that of CATT alone was 89.2%. Thus CATT was more relatively specific than CIATT. The combined use of the two serological tests detected more sleeping sickness cases then individual tests.

Oral Eflornithine monotherapy in late stage T.b gambiense Trypanosomiasis (results observed in 25 patients treated in Daloa Côte d'Ivoire)

Félix DOUA, Norbert Djè N'goran , Tanoe Miézan Wamian et Félix Boa Yapo

ABSTRACT

25 patients with late stage T.b. gambiense trypanosomiasis were treated with oral Eflornithine . These patients were divided in two groups A and B .
Patients of group A (n= 12) were treated with oral Eflornithine at the dosage of 400 mg/kg/day during 14 days and patients of group B (n=13) received oral Eflornithine at the dosage of 500 mg/kg/day during 14 days .
In the two groups of patients the initial cure rate (disapearance of trypanosomes from bodyfluid 24 hours after the end of treatment) was 100% .
Side effects were marked by digestive and hematologic disturbances and have been all reversible at the end of treatment course . No case of death were registered during treatment .
During follow-up one patient died home from pneumonia 4 months after the end of his treatment . Eight cases of relapses (32%) were noted in which 4 were from group A and 4 from group B.
Out of the 16 patients who are still in account , there is no new case of relapse but one patient is lost for follow-up . Out of the 15 patients who are under follow_up , one has 6 months of follow-up , 10 have 12 months of follow-up , 3 have 18 months of follow-up and one 23 months of follow-up without relapse.
In this study there were no difference in the two dosages of oral Eflornithine in terms of tolerance and efficacy.
Search for maximum dosage of oral Eflornithine tolerable and effective in late stage T.b. gambiense trypanosomiasis is necessary for the registration of the oral route of Eflornithine .

L'EFLORNITHINE ORALE DANS LE TRAITEMENT DE LA TRYPANOSOMIASE HUMAINE AFRICAINE A T.B GAMBIENSE EN PHASE NERVEUSE

(Résultats observés chez 25 patients à Daloa – Côte d'Ivoire)

Félix DOUA , Norbert Djè N'goran , Tanoe Miézan Wamian et Félix Boa Yapo

Résumé

25 patients en phase nerveuse de la trypanosomiase humaine africaine (THA) ou maladie du sommeil ont reçu de l'Eflornthine en monothérapie par voie orale . Ces patients ont été divisés aléatoirement en deux goupes A et B . Les patients du groupe A (n=12) ont reçu 400 mg/kg/j d'Eflornithine pendant 14 jours et ceux du groupe B (n=13) ont reçu 500 mg/kg/j pendant 14 jours .

Dans ces deux groupes de patients , le taux de guérison initiale (disparition des trypanosomes des liquides biologiques 24 heures après la fin du traitement) a été de 100%. Les effets secondaires du traitement marqués par les troubles digestifs et hématologiques ont été tous réversibles à la fin du traitement et aucun cas de décès n'a été enregistré au cours de l'hospitalisation des patients .

Pendant le suivi après traitement , un patient du groupe A est décédé 4 mois après la fin de son traitement à son domicile des suites d'une pneumopathie . 8 cas de rechute (32%) ont été notés au total dont 4 du groupe A et 4 du groupe B .

Sur les 16 patients encore en compte aucun nouveau cas de rechute n'est observé , mais un patient reste toujours perdu de vue 18 mois après la fin de son traitement . Sur les 15 patients restants , un a un recul de 6 mois après traitement , 10 ont un recul de 12 mois , 3 ont un recul de 18 mois et un a un recul de 23 mois .

Dans cette étude il n'a pas été notée de différence au plan de la tolérance et de l'efficacité entre les deux posologies de l'Eflornithine orale.

La recherche d'une dose maximale orale bien tolérée et efficace reste nécessaire pour l'enregistrement de cette formulation de l'Eflornithine dans le traitement de la THA à T.b. gambiense .

Comparative analysis of two isogenic clones of *Trypanosoma congolense* through Amplified Fragment Length Polymorphism leads to a putative genetic marker for isometamidium resistance

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Abstract

Amplified Fragment Length Polymorphism (AFLP) was used to compare two isogenic clones of *Trypanosoma congolense*. The parent clone, sensitive to isometamidium, has a CD50 in mouse of 0.018 mg/kg and its derivative exposed to increasing doses of isometamidium, has a CD 50 that is 94-fold higher. Sixty-four combinations of eight EcoR I and eight Mse I primers were used in AFLP analysis to detect subtle genetic differences between the two clones. Fifty-eight polymorphic fragments of DNA that were present only in the resistant clone were purified and then sequenced. One of the fragments had a 4Fe-4S-ferredoxin consensus pattern ([C]-x-x-[C]-x-x-[C]-x-x-x-[C]). Ferredoxins might thus play a role in the resistance of *Trypanosoma congolense* to isometamidium chloride. To the best of our knowledge, this is the first report of AFLP fingerprinting of isogenic clones of African trypanosomes pathogenic to livestock.

Mise en évidence d'un candidat marqueur génétique de résistance à l'isométamidium par l'analyse de deux clones isogéniques *de Trypanosoma congolense* par AFLP (Amplified Fragment Length Polymorphism)

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Résumé

La technique d'AFLP a été utilisée pour comparer deux clones isogéniques de *Trypanosoma congolense*. La souche parentale, sensible à l'isométamidium présente une CD50 de 0.018 mg/kg lors de tests sur souris et le clone dérivé qui a été soumis à des doses croissantes d'isométamidium présente une CD50 94 fois supérieure. Pour l'analyse AFLP, 64 combinaisons de huit amorces EcoR I et de huit amorces Mse I ont été utilisées pour la détection des différences génomiques entre les deux clones. Cinquante huit fragments polymorphiques d'ADN présents dans le clone résistant ont été isolés, purifiés et séquencés. Un de ces fragments présente la signature d'une ferrédoxine 4Fe-4S ([C]-x-x-[C]-x-x-[C]-x-x-x-[C]).
Les ferrédoxines pourraient donc être impliquées dans la résistance de *Trypanosoma congolense* à l'isométamidium. A notre connaissance, c'est le premier rapport de l'utilisation de l'AFLP pour la comparaison de deux clones isogéniques de trypanosomes africains pathogènes pour le bétail.

Comparative analysis of two isogenic clones of *Trypanosoma congolense* through Amplified Fragment Length Polymorphism leads to a putative genetic marker for isometamidium resistance

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Abstract for the 27th ISCTRC meeting, Pretoria, South Africa, 2003

Molecular genetic characterisation of small ruminants in West Africa

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Abstract:
Genetic characterisation of West African cattle populations shows that trypanotolerance attributes of the N'Dama population are threatened by introgression of genes emanating from trypanosusceptible Zebu cattle. A similar phenomenon is likely in small ruminants in coastal areas of The Gambia and elsewhere in W. Africa. This introgression of genes from susceptible breeds is of concern due to the vulnerability of the resulting crosses to trypanosomosis, which would threaten the sustainability of traditional West African farming systems. Furthermore, trypanotolerance in small ruminants may have been underestimated in animals previously characterised phenotypically as Djallonké, or WAD trypanotolerant breeds. Genetic characterisation of indigenous goats in West Africa will lead to a better understanding and future exploitation of their disease innate resistance.

A study was therefore initiated to genetically characterise goat breeds and 434 blood samples were obtained from goats at the following sites: St Louis and Fatick (Sénégal); Kolda and Sedhiou (Casamance region of Sénégal); Bansang, Keneba and Kombo Districts (The Gambia); Bafata and Gabu (Guinea Bissau); and Labé and Boké (Guinea Conakry). Those sites form a roughly north-south transect across the region. Phenotypic measurements of live-weight, heart girth, withers height, tail, ear, toggle (if present) and horn length (if present) were recorded. Animal age was estimated from their dentition and they were grouped into milk-, young- and mature animals. Locations (village name and geographical coordinates) and owner name and ethnic groups were recorded.

Samples were genetically characterised at ILRI in Kenya and this paper reports the preliminary results of this work.

Résumé pour la réunion du CISRLT prévue à Pretoria en Afrique du Sud, 2003

Caractérisation génétique des petits ruminants dans les régions ouest africaines

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Résumé
La caractérisation génétique de bovins d'Afrique de l'Ouest a révélé que le caractère trypanotolérant des taurins N'Dama était menacé par l'introgression de gènes de zébus trypanosensibles. Un phénomène similaire est probable chez les petits ruminants en Gambie et dans d'autres régions d'Afrique de l'Ouest. Ceci constitue un problème à cause de la vulnérabilité des produits métissés. Il pourrait donc menacer la robustesse et la durabilité des systèmes d'élevage traditionnels d'Afrique de l'Ouest. De plus, la trypanotolérance des petits ruminants a peut-être été sous-estimée chez des animaux antérieurement caractérisés phénotypiquement comme étant de races trypanotolérantes. La caractérisation génétique des chèvres d'Afrique de l'ouest permettra une meilleure compréhension et exploitation de leur résistance naturelle.

Une étude a donc été initiée pour caractériser génétiquement les races caprines. Du sang a été prélevé sur 434 chèvres, selon un transect nord-sud, à St Louis et Fatick (Sénégal) ; Kolda et Sédhiou (Sénégal) ; Bansang, Keneba et Kombo (Gambie) ; Bafata et Gabu (Guinée Bissau) ; Labé et Boké (Guinée Conakry). Le poids vif des animaux, la circonférence thoracique, la hauteur au garrot, la longueur de la queue, des oreilles, des pendeloques et des cornes ont aussi été enregistrés. Les animaux ont été classés en 3 groupes sur la base de leur dentition : animaux à dents de lait, jeunes ou mâtures. Les locations (nom du village et coordonnées géographiques), les noms des éleveurs et leurs groupes ethniques ont aussi été notés.

Les échantillons ont été analysés à ILRI au Kenya et les résultats préliminaires de ce travail sont rapportés dans ce papier.

Integration of Packed Cell Volume (PCV), parasitological findings and clinical condition of trypanosome-infected cattle in decision making on trypanocidal drug intervention

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Abstract

Trypanosomosis control is an important disease control activity in Tanzania as the disease ranks number one in terms of economic importance. Use of trypanocides is the major method of control. Unfortunately, trypanocidal drug resistance is reported in Tanzania. One of the causes of occurrence of drug resistance is drug pressure. And, one of the means to control drug resistance is to delay development of drug resistance by reducing the frequency of drug administration. Trypanosome-infected cattle can only remain productive if they can control development of anaemia and parasitaemia. Trends of Packed Cell Volume (PCV), parasitaemia and productivity of 13 dairy cows (Friesian/Ayrshire bulls x Boran dams) in a herd of 220 dairy cattle were followed-up at Mbagala in the peri-urban of Dar Es Salaam city in 28-monthly visits from November 2000 to February 2003, in an effort to predict a threshold whereby prescription for treatment would be minimum and productivity would be maintained. Trypanosomosis-positive cattle were treated with either diminazene aceturate (DA) 7.0mg per kg body weight (b.wt) or isometamidium chloride (ISMM) 1.0mg/kg.

Average PCV of the 13 cattle was 29.3. Four out of 13 cattle were microscopically negative for trypanosomosis and calved annually. Their average PCV for the period was relatively high (30.9) and stable. On the other hand, 9 cattle contracted trypanosome infections on 36 occasions. While three cows were infected once only, 6 cattle had the disease on 2-12 occasions albeit were able to control PCV and parasitaemia as well as productivity for periods ranging from 5 to 27 months with an average PCV range of 28.2 to 31.7 for the respective periods. Holding treatment until the diminishing PCV values reached 22 helped reduce treatments from 36 to 13. However, 4 additional treatments were given based on low PCV only (in the absence of trypanosomes and other haemoparasite infections). Trypanocidal drug pressure and treatment costs were reduced, by means of which development of drug resistant trypanosomes would be delayed. Ten out of the 13-disease-detected and treated cases were cured after DA treatment although one of the 10 cases sensitive to DA was resistant to ISMM. The three remaining cases were resistant to DA treatment. An effective treatment was reflected in increased PCV in at least a 30-day period after a successful treatment, whether on ground of trypanosome detection or low PCV. The host finally controlled parasitaemia and PCV values. Hence, animals with persisting trypanosomes should not undergo trypanocidal drug pressure but should have their feed improved to enhance self-cure. Reduction on the number of treatments was only possible by a close follow-up of the trend of PCV, parasitaemia, and productivity. A warning was already foreseeable the moment diminishing PCV values reached 23. Effecting treatment at this stage of PCV depression helped the animal maintain productivity. Waiting further prolonged the period to recovery of PCV and control of parasitaemia, hence productivity.

Integration of Packed Cell Volume (PCV), parasitological findings and clinical condition of trypanosome-infected cattle in decision making on trypanocidal drug intervention

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Key words: Biochemical , Changes, CATT, Sleeping sickness, Sudan

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04

APPLICATION OF CARD AGGLUTINATION TEST FOR TRYPANOSOMIASIS (CATT) AND CARD INDIRECT-AGGLUTINATION ANTIGEN TEST (CIATT) FOR DETECTION OF CAMEL TRYPANOSMOIASIS IN WEST SUDAN

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Summary
A total of blood samples from traditionally managed camels were examined parasitologically and serologically in Northern Kordofan State and Southern Kordofan State. The results revealed that only 4 cases (4.94%) were positive for detection of parasite (Trypanosoma brucei evansi). While,4 and 14 cases (4.94% and 17.28%, respectively) were recorded as ++ and + for Suratex. The results of CATT showed that 20, 15, 12 and 13 cases (out of 81) (24.69%, 18.52%, 14.81% and 16.05%, respectively) were reacted as +++,++,+ and +- , respectively) were recorded as ++ and + for CIAT. On the other hand, Suratex, CATT and CIATT were found to be 100% sensitive for detection of Trypanosoma burcei infection. High specificity was also recorded for CIATT and Suratex (83.1% and 81.8%, respectively). But low specificity was reported for CATT (44.2%).

Key word: Camel trypanosomiasis, Suratex, CATT, CIAT, Sensitivity, Specificity.

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Transmission Mécanique d'une souche africaine de Trypanosoma vivax par des Tabanides d'Afrique : Atylotus agrestis et Atylotus fuscipes

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Résumé

Les écosystèmes des mouches sont profondément modifiés par les changements climatiques globaux, la pression anthropique et la modification du milieu par l'agriculture. Ajoutées aux campagnes de lutte contre les glossines, ces modifications réduisent leur aire de distribution. Dans la partie Nord de l'Afrique de l'Ouest, Glossina morsitans disparaît des savanes tandis que G. tachinoides et G. palpalis gambiensis, les espèces des galeries forestières, sont affectées par la dégradation et la fragmentation de leur milieu. Sous de plus faibles pressions vectorielles, la transmission cyclique des trypanosomes du bétail peut devenir occasionnelle et provoquer le passage de situations enzootiques stables à des situations épidémiologiques instables. Dans ces conditions, la transmission mécanique des trypanosomes pourrait contribuer au développement de foyers épizootiques. La transmission mécanique de Trypanosoma vivax a longtemps été suspectée, en conditions naturelles ou expérimentales, mais sa confirmation, en Afrique, demeurait nécessaire. Pour démontrer la transmission mécanique d'un souche locale de Trypanosoma vivax par les espèces communes de tabanides africains Atylotus agrestis et A. fuscipes, des expériences ont été menées à Lahirasso, Burkina Faso, un secteur de faible pression glossinienne. Pour éviter toute interférence des glossines, les expériences ont été menées dans un corral protégé par une moustiquaire. Huit génisses (croisées zébu X Baoulé), indemnes de trypanosomose, ont été placées en présence de 2 génisses expérimentalement infectées par une souche locale de T. vivax. Des tabanides étaient capturés aux alentours à l'aide de 2 pièges Nzi. Ils ont été identifiés, comptés et immédiatement relâchés dans le corral sous moustiquaire, 5 fois par jour. Dans la première expérience, sous une pression moyenne quotidienne de 32 Atylotus agrestis par génisse pendant 20 jours, 5 des 8 génisses receveuses ont été trouvées infectées par examen microscopique du buffy coat, après des périodes d'incubation allant de 8 à 48 jours. Dans la seconde expérience, sous une pression moyenne quotidienne de 54 Atylotus fuscipes par génisse pendant 20 jours, 6 des 8 génisses receveuses ont été trouvées infectées par examen microscopique du buffy coat, après des périodes d'incubation allant de 9 à 29 jours. La transmission mécanique d'une souche africaine de *T. vivax* par A. agrestis et A. fuscipes a été démontrée de manière univoque, avec des taux d'incidence élevés (63-75% en 20 jours) sous une pression vectorielle moyenne (32-54 insectes/animal/jour). Le rôle des tabanides dans la transmission mécanique de T. vivax doit être re-considéré à la lumière de ces expériences. L'élimination, volontaire ou non, des glossines pourrait ne pas être suffisante pour éradiquer les trypanosomoses du bétail en Afrique.

Mots clef : Afrique, écosystème, Trypanosoma vivax, Tabanides, Atylotus agrestis, Atylotus fuscipes, transmission mécanique.

Mechanical Transmission of African Trypanosoma vivax by African Tabanids Atylotus agrestis and Atylotus fuscipes

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Abstract

Tsetse flies ecosystems are considerably modified by global climatic changes, anthropic pressure and agricultural landscaping. In addition, campaign for tsetse control are reducing their area of distribution. In the Northern part of West Africa, Glossina morsitans is disappearing from savannas while G. tachinoides and G. palpalis gambiensis, the riverine forest species, are affected by alteration and fragmentation of river landscapes. Under lower tsetse flies densities, cyclical transmission of livestock trypanosomes is affected and becomes occasional, which can lead from stable enzootic situations to unstable epidemiological situations. In such situations, mechanical transmission of trypanosomes may contribute to the development of epizootic outbreaks. The mechanical transmission of Trypanosoma vivax as for long been suspected, in both natural and experimental situations, but further confirmation was required. To demonstrate mechanical transmission of an African stock of Trypanosoma vivax by common African tabanids Atylotus agrestis and A. fuscipes, experiments were carried out in Lahirasso, Burkina Faso, an area of low tsetse pressure. To avoid tsetse flies interferences, the experiment was conducted in a fly proof conditions (corral covered by a mosquito net). Eight heifers (crossbred zebu X Baoulé), free of trypanosome infection, were kept together with 2 heifers experimentally infected with a local stock of T. vivax. Tabanids were trapped with 2 Nzi traps in the surrounding area. They were identified, counted and immediatly released into the fly proof corral 5 times a day. In a first experiment, under a mean daily pressure of 32 Atylotus agrestis per heifer during 20 days, 5 of the 8 receiver heifers proved to be infected by microscopic observation of buffy-coats, after incubating periods ranging from 8 to 48 days. In a second experiment, under a mean daily pressure of 54 Atylotus fuscipes per heifer during 20 days, 6 of the 8 receiver heifers proved to be infected by microscopic observation of buffy-coats, after incubating periods ranging from 9 to 29 days. Mechanical transmission of an African stock of *T. vivax* by A. agrestis and A. fuscipes was unequivocally demonstrated, at high incidence rates (63-75% in 20 days), under medium tabanids challenge (32-54 insects/animal/day). The role of tabanids as mechanical vectors of T. vivax should be re-considered, in light of these results. Natural or artificial clearance of tsetse flies may not be sufficient to eradicate livestock trypanosomosis from Africa.

Key words : Africa, ecosystem, Trypanosoma vivax, Tabanids, Atylotus agrestis, Atylotus fuscipes, mechanical transmission.

Identification de *Trypanosoma brucei gambiense* chez les porcs du foyer de la maladie du sommeil de Fontem (Cameroun) en utilisant la « Polymerase Chain Reaction » (PCR).

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Résumé.

Pour comprendre l'importance du réservoir porcin du trypanosome pathogène pour l'homme (*Trypanosoma brucei gambiense*) dans le maintien à bas bruit du foyer de la maladie du sommeil de Fontem, la PCR a été utilisée pour rechercher, chez 133 porcs de ce foyer, une séquence d'ADN répétée caractéristique de *Trypanosoma brucei gambiense*. Dans cette étude, l'ADN a été extrait du sang avec de la résine. Des couples d'amorces spécifiques de plusieurs espèces de trypanosomes ont été ensuite utilisées pour identifier, par PCR, les trypanosomes infectant ces porcs. Les résultats de cette étude montrent que des 133 porcs examinés, 56 (40%) sont porteurs d'ADN de *Trypanosoma brucei s.l.* (*Trypanozoon*). De ces 56 animaux, la séquence d'ADN caractéristique de *Trypanosoma brucei gambiense* a été révélée chez 21 d'entre eux. La prévalence de *Trypanosoma brucei gambiense* est de 15,8% (21/133) chez les porcs examinés du foyer de la THA de Fontem. *Trypanosoma vivax* et *Trypanosoma congolense* "type forest" ont été aussi identifiés chez 34,6% (46/133) et 46% (61/133) de porcs respectivement. Des 133 porcs étudiés, 51 (35,3%) d'entre eux sont porteurs d'infections multiples. Ces résultats montrent que, dans le foyer de la maladie du sommeil de Fontem, les porcs constituent un réservoir important de *Trypanosoma brucei gambiense*. Ces animaux peuvent jouer un rôle d'écran protecteur pour l'homme et seraient un des facteurs importants du maintien de la maladie du sommeil dans le foyer de Fontem.

Mots clés : *Trypanosoma brucei gambiense*, maladie du sommeil, PCR.

Identification of *Trypanosoma brucei gambiense* in pigs from Fontem (Cameroon) sleeping sickness focus using the Polymerase Chain Reaction (PCR).

Abstract.

To understand the importance of pig reservoir for human pathogenic trypanosomes (*Trypanosoma brucei gambiense)* in the maintenance of Fontem sleeping sickness focus, PCR has been used to search, in 133 pigs from this focus, repeated DNA sequences characteristic of *Trypanosoma brucei gambiense.* In this study, DNA has been extracted by anionic resin. Specific primers for several trypanosome species have been used to identify, by PCR, trypanosomes infecting these pigs. Results from this study show that from 133 pigs examined, 56 (46%) hosted *Trypanosoma brucei s.l.* From these 56 animals, DNA sequences characteristics of *Trypanosoma brucei gambiense* have been revealed in 21 of them. The prevalence of *Trypanosoma brucei gambiense* is 15.8% (21/133) in pigs from Fontem sleeping sickness focus. *Trypanosoma vivax* and *Trypanosoma congolense* « forest type » have also been identified in 34.6% (46/133) and 46% (61/133) of pigs respectively. From the 133 pigs studied, 51 (35.3%) hosted multiple infections. These results show that, in Fontem sleeping sickness focus, pigs constitute an important reservoir for *Trypanosoma brucei*

gambiense. These animals may serve as screen for human and could be one of the most important factors of the maintenance of Fontem sleeping sickness focus.

Key words: *Trypanosoma brucei gambiense*, PCR, sleeping sickness.

SUMMARY

Wild fauna as probable animal reservoir for *Trypanosoma b. gambiense* in south Cameroon

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In order to assess the role of wild animal as potential reservoir of *Trypanosoma brucei gambiense* in South Cameroon, we collected blood from game animals in 3 sleeping sickness foci (where cases of sleeping sickness have been reported between 1998 and 2000) and from a non-endemic region as control.

The 1,142 games sampled belonged to 36 different species and 7 different taxa. Parasitological (QBC and KIVI) and molecular (PCR) tests were carried out on blood samples. QBC test identified trypanosomes in 2% (12/609) of the animals examined and Culture (KIVI) test detected 43 of 234 animals diagnosed as positive. Eight trypanosomes stocks were isolated including one from water guib (sitatunga), two from crocodiles, three from blue duikers, one from palm civet and one from greater white-nosed monkey.

Using specific primers, *T. brucei s.l.* was identified in 7.5% of wild animals in the endemic area and in 5% of those of the non-endemic zone. Of the 62 animals that were positive for *T. brucei s. l.* in the endemic zone, PCR revealed *T. b. gambiense* group I DNA in 18, given a prevalence of 2.2%. *T. b. gambiense* group I was absent from animals of the non endemic zone. This species was identified from 2 rodents, 2 ungulates , 2 carnivores and 2 primates. This study showed that wild fauna could constitute an animal reservoir of *T. brucei gambiense* in South Cameroon. The epidemiological implications of these findings have to be determined with further investigations.

RESUME

EF

La faune sauvage est un réservoir animal potentiel de *Trypanosoma b. gambiense* au sud Cameroun

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Dans le but d'étudier le rôle de la faune sauvage comme réservoir animal potentiel de *Trypanosoma brucei gambiense* au Sud Cameroun, du sang a été récolté sur ces animaux dans 3 foyers de maladie du sommeil (où des malades avaient été signalés entre 1998 et 2000) et dans une région non endémique servant de témoin.

Les 1.142 animaux prélevés appartenaient à 36 espèces et 7 taxons différents. Des tests parasitologiques (QBC et KIVI) et moléculaires (PCR) ont été pratiqués sur ces échantillons de sang. Les tests QBC ont permis d'identifier des trypanosomes chez 2% (12/609) des animaux examinés et la mise en culture (KIVI) a permis de détecter des trypanosomes chez 43/234 des animaux diagnostiqués positifs. Huit souches de trypanosomes ont ainsi pu être isolées : une provenant du guib d'eau (sitatunga), 2 du crocodile, 3 du céphalophe bleu, 1 de la nandinie et une du cercopithèque.

Par PCR, *T. brucei s.l.* a été mis en évidence chez 7.5% des animaux de la région endémique et chez 5% de ceux de la zone témoin. Sur les 62 animaux positifs à *T. brucei s. l.* dans la zone endémique, la PCR a mis *T. b. gambiense* groupe I en évidence chez 18 d'entre eux (prévalence de 2.2%). *T. b. gambiense* group I était absent dans la région non-endémique. Cette espèce a été détectée chez 2 rongeurs, 2 ongulés, 2 carnivores et 2 primates. Cette étude montre que la faune sauvage pourrait jouer un rôle de réservoir de *T. brucei gambiense* au sud Cameroun. Les implications épidémiologiques de ces résultats notamment au niveau de la circulation des parasites devraient être évaluées par des études complémentaires.

Développement d'un test d'immunofluorescence directe (DIFAT) pour le diagnostic parasitologique de la trypanosomiase Africaine.

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L'examen de la goutte épaisse colorée au Giemsa est l'une des techniques les plus utilisées pour le diagnostic parasitologique de la trypanosomiase Africaine. Pourtant la technique est laborieuse et la reconaissance du trypanosome peut-être difficile à cause des artéfacts et des déformations morphologiques du parasite. Cependant nous avons développé un test d'immunofluorescence direct pour une lecture plus facile, plus rapide et plus fiable des gouttes épaisses.

Un boeuf à été infecté avec *Trypanosoma brucei* (*T.b.*) *brucei* AnTat 1.1A, traité au bérénil après trois semaines et immunisé avec une préparation brute de *T.b. gambiense* LiTat 1.5 et *T.b gambiense* LiTat 1.3 après 4 et 7 semaines. Après dix semaines, le sérum était très réactif en immunofluorescence indirecte avec *T. evansi*, *T.b. rhodesiense*, *T. congolense* and *T. vivax*. Les anticorps sériques ont été purifiés par précipitation avec le sulfate d'ammonium. La fraction purifiée a été marquée fluorescente avec FITC, et la réactivité du conjugué à été de nouveau testée par immunofluorescence directe sur différentes espèces de trypanosomes. Le conjugué réagissait principalement avec les sous-espèces de *T. brucei*.

Des gouttes épaisses de 1 µl contenant 1, 4, 16 et 64 trypanosomes/µl ont été préparées. Certaines gouttes épaisses ont été colorées au Giemsa, d'autres ont été préparées par la technique DIFAT. Les préparations ont été lues par trois personnes. Le temps nécessaire pour la détection du premier trypanosome a été noté. Les lames ont été notées négatives si aucun trypanosome n'a été observé pendant dix minutes. Pour les gouttes épaisses contenant 4, 16 et 64 trypanosomes/µl, la méthode DIFAT est significativement plus rapide (respectivement 2.4, 9 et 35 fois) que la coloration de Giemsa. Avec la technique DIFAT seul le trypanosome est coloré dans la goutte épaisse, il en résulte une meilleure identification. Ceci permet un screening plus rapide et conduit à une meilleure sensibilité. Par sa réactivité avec les sous-espèces de *T. brucei*, DIFAT peut améliorer de manière significative le diagnostic de la trypanosomiase africaine humaine. La disponibilité d'appareils à faible coût pour adapter des microscopes ordinaires à la fluorescence pourra faciliter l'application du DIFAT sur le terrain. L'amélioration de la technique et la stabilité du conjugué restent nécessaires.

Development of a direct immunofluorescence test (DIFAT) for parasitological diagnosis of African trypanosomiasis.

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Examination of a Giemsa stained thick blood film is one of the most applied parasitological techniques for diagnosis of African trypanosomiasis. The technique is however laborious and trypanosome recognition may be difficult due to artifacts and morphological distortion of the parasite. We therefore developed a direct immunofluorescence test for easier, more reliable and rapid reading of the thick blood film.
A bovine was infected with *Trypanosoma brucei (T.b.) brucei* AnTat 1.1A, treated with berenil after 3 weeks and immunised with crude extracts of *T.b. gambiense* LiTat 1.5 and *T.b. gambiense* LiTat 1.3 after 4 and 7 weeks. After 10 weeks, the serum was highly reactive in indirect immunofluorescence with *T. evansi*, *T.b. rhodesiense*, *T. congolense* and *T.vivax*. Antibodies were purified from the serum by ammoniumsulfate precipitation. The purified fraction was fluorescently labelled with FITC, and the reactivity of the conjugate was again tested in direct immunofluorescence on different trypanosome species. The FITC conjugate was mainly reactive with *T. brucei* subspecies.
One microliter thick blood film preparations with 1, 4, 16, and 64 trypanosomes/µl (*T.b. brucei*) were prepared and Giemsa stained or developed with DIFAT. The preparations were examined by 3 persons. Reading time needed to detect the first trypanosome was recorded. Slides were scored negative when no trypanosomes were detected within 10 minutes. For thick blood film preparations with 4, 16, and 64 trypanosomes/µl, DIFAT was significantly quicker (respectively about 2.4, 9 and 35 times) than Giemsa staining. In DIFAT only the trypanosome is stained in the tick blood film preparation, resulting in better recognition. This allows quicker screening of the preparation and leads to improved sensitivity.
Due to its reactivity with the *brucei*-subspecies, DIFAT can significantly improve the diagnosis of human African trypanosomiasis. The availability of simple, low-cost fluorescence devices to adapt ordinary microscopes will also make it applicable under field conditions. Further improvement, stabilisation and testing of the conjugate remain necessary.

The development of single and mixed *T. brucei* infections in cattle

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Recent outbreaks of human sleeping sickness in Uganda have clearly demonstrated the possible role of cattle as reservoir of *Trypanosoma brucei rhodesiense*. Unfortunately, little is known of the way how *T. brucei* behaves in cattle.

To clarify the development of a *T. brucei* infection in cattle and to evaluate the effect of prior infections with other trypanosome species such as *T. congolense* or subsequent infection with *T. congolense* on this development, experiments were conducted. Cattle were infected through the bites of tsetse infected with *T. b. brucei* or *T. congolense*. Subsequently, the development of the parasitaemia was monitored using parasitological and molecular tools. Teneral tsetse were used to determine the transmissibility of the *T. b. brucei*, *T. congolense* or mixed *T. b. brucei*/*T. congolense* infection throughout their development.

Results show that the development of *T. b. brucei* in cattle can be divided into an initial acute phase with fever and the development of anaemia. The acute phase is followed by a chronic phase of infection during which the infection is cryptic but is still transmitted by tsetse. Eventually, the levels of parasitaemia are below those required to infect tsetse but parasites can still be detected in certain tissues. Concurrent or previous infections with other trypanosome species did not inhibit the development and transmission of *T. b. brucei* and a high proportion of mixed (*T. b. brucei*/*T. congolense*) infections was observed in the infected tsetse flies.

Le développement d'infections simples et mixtes de *T. brucei* chez les bovins

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Les épidémies récentes de la maladie du sommeil en Ouganda ont démontré clairement le rôle des bovins comme réservoir de *Trypanosoma brucei rhodesiense*. Malheureusement, peu d'informations sont disponibles sur le comportement de *T. brucei* chez les bovins.

Plusieurs expériences ont été faites afin d'étudier le développement de *T. brucei* chez le bétail et d'évaluer l'effet d'infections antérieures ou postérieures avec *T. congolense* sur le développement de *T. brucei*. Les infestations des bovins ont été réalisées par la piqûre de mouches tsé-tsé infestées soit avec *T. b. brucei*, soit avec *T. congolense*. Par après la parasitémie a été suivie en utilisant des outils parasitologiques et moléculaires. Des glossines ténérales ont été utilisées afin d'étudier la transmissibilité de *T. b. brucei, T. congolense* ou d'infections mixtes *T.b. brucei/T.congolense* au cours de leur développement.

Les résultats ont montré que le développement de *T. b. brucei* se caractérise par une phase initiale aiguë avec fièvre et développement d'anémie, qui est suivie par une phase chronique, pendant laquelle l'infection est cryptique, mais peut être transmise par des glossines. A la fin de cette phase l'infection n'est plus transmissible par les mouches tsé-tsé, mais les parasites peuvent encore être détectés dans certains tissus. La présence d'infections simultanées ou antérieures avec d'autres espèces de trypanosomes n'empêchait ni le développement, ni la transmission de *T. b. brucei*. Une proportion importante d'infections mixtes (*T. b. brucei/T.congolense*) a été observée chez les mouches tsé-tsé infestées.

R. Omolo.

From: Solomon Hailemariam
Sent: Wednesday, April 30, 2003 2:19 PM
To: R. Omolo.
Subject: FW: Pascherche et la lutte contre les trypanosomoserticipation à la 27è réunion du conseil scientifique international pour la re

Dear Rispa. Please take note. Solomon
-----Original Message-----
From: OUEDRAOGO Georges Anicet [mailto:oga@fasonet.bf]
Sent: 29 April 2003 23:22
To: Dr. J. Musiime
Cc: Solomon Hailemariam; rbagnall@mweb.co.za; bagnallr@allerton.kztl.gov.za
Subject: Pascherche et la lutte contre les trypanosomoserticipation à la 27è réunion du conseil scientifique international pour la re

Effet de l'infection trypanosomienne sur la nutrition chez le mouton Mossi.

Pr OUEDRAOGO G.A* .,LAOUALI A.*

***Institut du Développement Rural, Université Polytechnique de Bobo-Dioulasso**
Burkina Faso.

Le mouton Mossi est reconnu trypanorésistant. Des paramètres de nutrition (ingestion volontaire et digestibilité) ont été étudiés chez cette race , suite à une infection expérimentale par une souche de Trypanosoma congolense.
Cinq essais sur 20 béliers âgés de 1 à 2 ans dont 10 témoins ont permis d'étudier l'impact de l'infection sur la digestibilité d'une ration test composée de foin de Pennisetum pedicellatum fauché au stade épiaison et tourteau de coton et avait de l'eau *ad libitum*.Les animaux infectés ont reçu chacun $1x10^5$ T congolense en intraveineuse.
De manière précoce on constate une diminution de l'ingestion volontaire chez les sujets infectés avec une corrélation positive(r=91p100) entre le nombre de jours après infection et la quantité ingérée.
Trois essais de digestibilité à des périodes différentes (un mois après l'infection, deux mois plus tard et une semaine après traitement par trypanocide) sur les mêmes animaux ont donné les résultats suivants :

- Il n'existe pas de différence significative au niveau de la digestibilité de la matière sèche (MS), de la matière azotée totale (MAT) et de la matière organique (MO).
- Digestibilité des NDF : Pas de différence significative entre lot témoin et lot infecté, mais différence significative entre lot infecté selon le délai de l'infection.
- Digestibilité de ADF : Mise en évidence de différences significatives entre les différents lots.

Le présent travail contribue à la connaissance du comportement du mouton Mossi lorsqu'il est soumis à une forte pression trypanosomienne.

MAPPING THE BENEFITS: FIRST STEPS IN DEVELOPING A NEW DECISION TOOL FOR TSETSE AND TRYPANOSOMIASIS INTERVENTIONS

Alexandra Shaw[1], Guy Hendrickx[2] and William Wint[3]

Considerable investments have been made by FAO, DFID and the PAAT both in mapping and in other tools for enhancing strategic planning of tsetse and trypanosomiasis control. Two key themes have been: the practical applications of GIS for tsetse-trypanosomiasis risk assessment and the analysis of guiding economic principles for the identification/selection of tsetse and trypanosomiasis (T & T) intervention areas in West Africa. This study investigates to what extent these can usefully be combined and whether linking quantitative economic variables to a GIS spatial framework provides new insights and refines and reinforces the decision-making process. The investigation focuses on parts of Benin, Burkina Faso, Ghana, Mali, and Togo.

A range of standardised livestock production and price data were collected at national, province and district level from each country, together with the most recent livestock, cropping and disease data. These were amalgamated with the corresponding data layers from the PAAT Information System and new distribution maps of trypanotolerant and susceptible cattle breeds were produced. Existing information on the disease's impact on cattle production parameters were incorporated in herd models. These were used to estimate the potential benefits of T & T interventions within a series of cattle management systems in dry and moist ecosystems. These systems were then mapped, thereby allowing the potential benefits to be mapped also. The implications for expansions in livestock populations and changes in their distribution are also examined.

Maps of potential benefits for selected regions are presented. The extent to which this approach complements and refines the current range of mapped variables and adds to existing decision making tools is discussed.

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Comparison of the curative activity of two formulations of diminazene aceturate (Veriben®, CEVA Sante Animale, France) (Standard granular and the Sterile injectable solution), against *Trypanosoma Congolense* in cattle

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Summary

A study was undertaken to evaluate the efficacy and pharmacokinetics of a sterile injectable solution against a standard granular formulation of diminazene aceturate (Veriben®, CEVA Sante Animale, France). The drug formulations were tested against a well-characterised sensitive stock of *Trypanosoma congolense* KETRI 3724 (a derivative of IL 1180) in cattle. Each of twenty-one Zebu steers was infected intravenously with 10^5 trypanosomes. At the onset of parasitaemia, the cattle were divided in three groups. Groups 1 and 2 (comprising of 7 animals each) were treated with either the standard granular or the sterile injectable solution formulation at 3.5 mg/kg body weight (bw), respectively. Cattle in Group 3 (7 animals) were infected untreated controls to monitor the course of infection. When the packed cell volumes (PCVs) of the infected animals dropped by 20% from the time they were first detected positive with trypanosomes, they were treated curatively with the standard granular formulation (Veriben®) at 3.5 mg/kg bw intramuscularly (im). All the animals were monitored for 60 days after treatment. Blood samples for plasma preparations from animals in Groups 1 and 2 were collected at pre-determined time intervals for 14 days after treatment. Plasma drug levels were determined using the Diminazene Enzyme Linked Immunosorbent Assay (ELISA).

The two drug formulations cured cattle infected with the drug sensitive *T. congolense* KETRI 3724. Both formulations had similar parasite clearance rate. The ready to use solution formulation had a better positive effect on body weight than the standard granular formulation.

Results of the pharmacokinetics showed significantly higher values for the mean maximum time (T_{max}) at which the mean maximum drug concentration (C_{max}) was achieved in cattle treated with the standard granular formulation than those treated with the new formulation. The mean residence time (MRT) values were higher for the new formulation but the differences between the two products were not significant. However implications of these findings on prophylaxis against animal trypanosomosis need to be investigated further.

In conclusion, the introduction of the sterile injectable solution on the market will contribute to (a) efforts towards the development of formulations of existing trypanocidal compounds for easy use by farmers that avoid complications related to drug preparation in trypanosomosis endemic areas and (b) ensuring proper drug usage in order to minimise cases of drug resistance.

MUNGA

ABSTRACT
Control of tsetse and trypanosomosis in traditionally managed cattle using alpha-cypermethrin 1,5% pour-on (RenegadeTM) in Kenya
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Traditionally managed cattle grazing on a community owned ranch in Southwest Kenya were treated with 1.5g/l alpha-cypermethrin pour-on (RenegadeTM) at two weekly intervals for a period of one year. In an adjacent ranch, cattle were treated with an organophosphate acaricide to control ticks, but not with Renegade. One hundred cattle in each ranch were monitored at monthly intervals for packed cell volume (PCV) of blood and trypanosomosis prevalence, using haematocrit centrifugation/buffy coat technique. Apparent tsetse fly density was monitored using standard biconical traps baited with phenols and acetone in the two ranches where cattle grazed. RenegadeTM application caused a significant reduction in trypanosomosis prevalence in cattle ($P<0.001$), and this effect was cumulative with time. Fly numbers in the two areas showed seasonal fluctuation, and although the RenegadeTM area started with higher tsetse fly catches with a peak of 135 flies/trap/day compared to 50 traps/trap/day in the control area, subsequent peak season catches were lower than in the control area (85 flies/trap/day compared to 120 flies/trap/day). Seasonal weather changes did not have a significant effect on the effects of RenegadeTM on the tsetse fly catches and disease prevalence. Good tick control was apparent although this was not quantified. It was concluded that application of RenegadeTM on cattle had beneficial effects on both the disease and vector control, and can therefore be recommended for use in integrated tsetse and trypanosomosis control in Kenya.

Impact of animal trypanosomosis on dairy cattle production in western Kenya

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ABSTRACT

The social background, farm characteristics, dairy cattle productivity and grazing system of 90 randomly selected dairy farmers in a trypanosomosis-free area of western Kenya were compared with those of 90 and 30 farmers from medium and high trypanosomosis risk areas respectively. All the 210 farmers were visited between July and August 2002. Data analysis was performed using descriptive statistics and analysis of variance. The results showed that increased trypanosomosis risk reduced income from crops by 88 % among the dairy farmers. The mean monthly off-farm incomes were however significantly higher in the high-risk areas. Trypanosomosis risk also altered the grazing management system used and made dairy farming a more costly activity. Trypanosomosis risk was found to have no significant effect on the choice of quality of dairy animals reared but decreased the density of these animals by 62 % and increased the calving interval from about 14 to 25 months. In addition, trypanosomosis reduced human settlement by 20 %. This study concluded that the potential benefits of trypanosomosis control seem to be high. Removal of trypanosomosis constraint on dairy production would lead to significant gains since the demand for, and prices of dairy products are expected to increase both domestically and internationally.

ISCTRC Abstract

Effect of isometamidium prophylaxis on milk yield in dairy cattle under natural trypanosomosis challenge at the coastal region of Kenya

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Isometamidium prophylaxis has been used extensively in the control of animal trypanosomosis in Africa. Reduction in milk yield has been implicated as one of the immediate adverse effects of isometamidium treatment in the field. A study to evaluate the effect of isometamidium prophylaxis on milk production in cattle over two prophylactic periods of 3 months each was conducted in two selected sites in Kwale district in the southern coastal region of Kenya. In each site cattle were divided into two groups, sentinel and isometamidium-treated. On one site cattle were treated with isometamidium at 1 mg/kg b.w while on the other site cattle were treated at 0.5 mg/kg b.w. Milk yield was monitored daily.

In all sites there was no significant different in the milk off take between the two prohylactic periods. Isometamidium prophylaxis decreased milk yield significantly ($p<0.001$). The decrease in milk yield was more evident when isometamidium was administered at 1mg/kg than at the lower dose of 0.5mg/kg. The number of breakthrough infections in a prophylactic period did not appear to have an effect on the milk off take. There was a significant ($p< 0.01$) increase in milk yield with increase in days post isometamidium administration, suggesting that the increase in milk yield was associated with decrease in isometamidium levels in cattle with time. These studies have confirmed the claims by farmers that isometamidium prophylaxis has a detrimental effect on milk productivity. However, this effect is dependent on the dose of the drug administered.

J16 ~~J5~~ 516

ISCTRC Abstract

Evidence of improper use of trypanocidal drugs by farmers and field personnel in one district in Kenya

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With the change in the Kenya government policies on provision of veterinary and other essential services over the years, the health care of livestock has largely become the responsibility of individual owners. The farmers have had to treat their livestock with no relevant training whatsoever. The development of drug resistance over the years has therefore widely been attributed to improper use of the drugs by the farmers. A trial was conducted in one district in Kenya to evaluate the use of isometamidium by farmers and veterinary field personnel. Three sites of similar trypanosomosis risk were selected. In each site two groups of cattle, isometamidium-treated and sentinel were monitored weekly for trypanosomes. Treatment of the animals in each site was administered either by the farmers, an Animal Health Assistant (AHA) or the investigating team respectively. Serum drug levels were determined using the ELISA technique. The drugs used in each site were all purchased from the same pharmaceutical outlet. Isometamidium levels in cattle treated by the investigating team were significantly higher ($p<0.001$) than levels in cattle treated by either the farmers or the AHA. In addition, the drug levels in cattle treated by the AHA were significantly lower ($p<0.05$) than levels in cattle treated by the farmers. The estimated dose for isometamidium administered by the investigating team, the Animal Health Assistant and the farmers ranged from 0.94-1.29 mg/kg bw, 0.24-0.73 mg/kg bw and 0.43-1.8 mg/kg bw respectively. It was evident that the AHA was under dosing the animals with isometamidium while the farmers, though using a dose close to the recommended prophylactic one of 1mg/kg bw were administering the drug incorrectly leading to lower serum drug levels. This incorrect administration of trypanocides may have contributed to development of multiple drug resistance isolates obtained from these areas. There is need for farmers and other users to be re-educated on proper and effective use of prophylactic drugs.

ISCTRC Abstract

Variation in sensitivity of *T. congolense* and *T. vivax* infections to diminazene at the coastal region of Kenya

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The coastal region of Kenya is a tsetse and trypanosomosis endemic area. The common pathogens in livestock in the area are *T. congolense* and *T. vivax*. Over the years of drug usage, reduced sensitivity of cattle infected by these strains to trypanocidal drugs has been observed. This has led to use of higher doses of the drugs than initially recommended to effect cure or prophylaxis. Studies to evaluate the efficacy of trypanocidal drugs in cattle were conducted on Galana Ranch and three selected sites in Kwale district on the coast of Kenya. Groups of cattle under prophylaxis and exposed to natural tsetse challenge were examined weekly for presence of trypanosomes. On detection of parasitaemia, the animals were treated with diminazene aceturate at 7 mg/kg b.w. The efficacy of diminazene treatment was determined by establishing the proportion of first infections in the sentinel cattle that were cured after treatment. First infections were considered as the first infection detected in each sentinel animal from the beginning of the prophylactic period. These infections were assumed to have been cured if cattle became aparasitaemic for 8 consecutive weeks with PCV>26% in each of those weeks following treatment with diminazene aceturate. In Galana ranch, over a three year study period a significantly higher ($p < 0.01$) proportion of *T. congolense* infections (66%) were cured than *T. vivax* infections (36%). The proportion of infection cured appeared to relate to the trypanosome challenge. In the year of low challenge (43 new infections), 84% of the infections were cured while 38% of the infection treated were cured during the year with a higher challenge (107 new infections). In Kwale district, a significantly lower ($p<0.05$) proportion of *T. congolense* infections (43%) were cured than *T. vivax* infections (74%). The proportion of *T. congolense* infections cured was between 30-50% while that of *T. vivax* infection cured was between 64-88% at the selected sites. This is an indication of the existence of different *T. congolense* and *T. vivax* populations with varying susceptibility to diminazene.

Vector-transmitted infections with emphasis on trypanosomosis among indigenous cattle in Teso district, western Kenya

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[1]Abstract

A cross-sectional livestock survey was carried out between May and September 2001 in Teso district of western Kenya. The objective of the study was to establish the disease status in cattle for use in planning control programs. This was done through estimation of the prevalence for vector-transmitted diseases in cattle. A total of 1,265 cattle were sampled during the study. The presence of trypanosomosis in cattle was determined using the buffy coat technique. Prevalence of other haemoparasites (*Anaplasma*, *Babesia* and *Theileria*) was determined parasitologically by examination of Giemsa-stained thin blood smears. Simultaneously, one-off entomological data was collected and Rapid Rural Appraisal of the disease situation done using participatory methods. Parasitological tests indicated that the prevalence rates were 13.4% for trypanosomosis, 13% for anaplasmosis and 2.8% for *Theileria parva*, respectively. *Trypanosoma vivax* was the most predominant trypanosome species encountered, with a prevalence of 11.4%. This accounted for 84.7% of all trypanosomosis positive cases detected. The other results were 1.3% for *T. congolense*, 0.5% for *T. brucei* and 0.0024% for mixed infections. Entomological data revealed a wide variation of Fly/Trap/Density (FTD) from 0 to 22.8, with their infections ranging between 0 and 39.4 to 0 in the various sub locations. From linear regression it was evident that area of origin and sex ($p<0.05$), but not age ($p>0.05$) influenced the prevalence of trypanosomosis. Key informant interviews indicated that grazing in bush and watering at specific sites exposes the cattle to infections. The results further indicated that control interventions were justifiable. It was further recommended that integrated techniques', e.g. synthetic pyrethroids, used for control of both trypanosomosis and tick-borne diseases be considered.

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ISCTRC ABSTRACT

The performance of Orma Boran and Maasai Zebu crossbreeds in a trypanosomosis endemic area of Nguruman, southwestern Kenya

Maichomo, M.W.[1], Ngare, P.M.[1] and Ole-Mapenay, I.M.[2], and Ndung'u, J.M.[1]
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Abstract

Longitudinal studies on the trypanotolerance of Orma Zebu (OZ) cross (F_1 progeny) and their Maasai Zebu (MZ) contemporaries were carried out in Nguruman, southwestern Kenya. The two cohorts were monitored for incidence of trypanosomosis, level of parasitaemia, PCV, body weight and average daily weight gain (ADWG) from birth up to a period of two years and data was analysed using analysis of variance and general linear models. During the study period, overall trypanosomosis incidence was low (3%). The 0Z crosses had a higher prevalence of infection compared to the MZ controls (61% Vs 39%); apparently, the mean PCV and mean daily weight gain for the OZ was higher than that of the MZ. The average weaning weight for the OZ and MZ was 81.3 kg and 73.7 kg respectively, while at 18 months of age their mean body weight was 149 kg and 119 kg respectively. The latter is important to pastoralists as it indicates the market value of mature animals. During the rainy season significant differences in average daily weight gain were noted ($p<0.05$). These were superior in the OZ in spite of higher infection rates, which could be an indicator of enhanced trypanotolerance. More over, the perceived psychological satisfaction of the farmers associated with good performance of the OZ is an important criterion for the adoption of the trypanotolerance genotype, as a sustainable trypanosomosis control strategy.

ISCTRC ABSTRACT

Epidemiological factors associated with trypanotolerance in Orma Boran cattle: a retrospective study of Galana Ranch, Kenyan coast

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Trypanotolerant cattle are known to be relatively productive under low to medium tsetse challenge. Attempts have therefore been made to disseminate these breeds to tsetse-infested areas where the trait could be utilised in improving livestock production. However, the environmental conditions in the areas of introduction could influence the nature and stability of the trypanotolerance phenotype. To understand the nature of the possible influencing factors, an analysis of data collected in a period of over 10 years on trypanotolerant Orma Boran cattle raised at Galana Ranch in Kenya was carried out. Breeding was carried out selectively to enhance trypanotolerance. Th herd was sampled for trypanosomiasis fortnightly using the buffy coat technique and animals that maintained packed cell volumes of more than 25% through subsequent samplings were considered to have an appreciable degree of trypanotolerance. Environmental factors considered were season, previous exposure and trypanosome species. Age and sex of each animal and period since herd establishment were considered as confounding factors and hence included in the analysis. Out of a total of 7046 records examined, 567 (or 7.5%) belonged to the animals that were resistant to trypanosomosis. The proportion of animals that acquired resistance rose steadily from the first year upto the 11th year. Young animals controlled trypanosome infections than older ones. Similarly, females were better than males in managing these infections. Animals infected with *Trypanosoma congolense* were able to control the infection for a longer period than those infected with either *T.vivax*, or both parasites. Moreover, animals that had been infected between 4 to 8 times tolerated trypanosomiasis infection better than those that had been infected less than four or more than 8 times. These results indicate that the level of trypanotolerance at the individual level could be influenced by environmental conditions under which the assessment is made.

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ISCTRC Abstract

The Prevalence of Tsetse-Transmitted Trypanosomosis in Camels in Kajiado District of Kenya.

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In Kenya, camels were traditionally kept in areas free of tsetse flies. However as more pastoralists recognise the importance of these animals due to their ability to survive and be productive in times of drought, camel herds are increasingly being introduced in arid and semiarid areas previously occupied by cattle and small ruminants only, which sometimes are tsetse-infested. A cross-sectional study was undertaken in the tsetse infested Kajiado district of Kenya to determine prevalence of camel trypanosomosis. Blood samples from 347 camels were collected and examined for trypanosomes using the buffy coat (BCT) and Polymerase Chain Reaction (PCR) techniques. The mean point prevalence was 7.8% using BCT, with 96.3 % (26) positive for *Trypanozoon* trypanosomes and 3.7% (1) for *T.congolense*. The mean point prevalence was 15.5% using the PCR technique, with 58.5% (31) positive for *T.evansi*, 22.6% (12) positive for *T.brucei*, 15.1% (8) positive for *T.vivax* and 3.8% (2) positive for *T.congolense* 'savannah'. The detection rate of PCR (15.5%) was two-fold higher than BCT (7.8%), indicating the high sensitivity of PCR. PCR also revealed that the prevalence of tsetse-transmitted trypanosomosis was 41.5% compared to 58.5% for the non-tsetse transmitted one. These results suggest that tsetse-transmitted trypanosomosis is an important disease of camels reared in or near tsetse-infested areas and points to a need for comprehensive studies on the epidemiology of disease in these animals.

ISCTRC ABSTRACT

Conservation of trypanotolerant Orma-boran through utilisation

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Stocking of trypanotolerant breeds has been identified as one of the sustainable approaches to trypanosomosis control in tsetse infested areas of Kenya. However, limited numbers of trypanotolerant animals has hindered their widespread adoption. This has drawn local and international attention necessitating the need to conserve local trypanotolerant breeds. In an effort to conserve the trypanotolerant Orma Boran (OB) cattle found in Kenya, the Kenya Trypanosomosis Research Institute (KETRI) established a breeding herd in 1985. This was followed by demand driven dissemination of bulls to tsetse infested areas of the country. The programme involves identification of superior OB genetic material for use for multiplication and dissemination purposes based on higher growth rates and ability to tolerate trypanosomosis infection. The superior stock are recruited into nucleus breeding herds and subjected to high levels of tsetse challenge. Three sites where this dissemination has been done include Busia, Nguruman and Narok. So far, there are approximately 300 both F1 and F2 Orma/Zebu crosses in the areas with observed good growth rate, resistance to trypanosomosis and better survival after drought (herd turn over). With increased awareness of the breed, which has been registered, there exists high demand requiring its further multiplication. This will prevent erosion of trypanotolerance in the OB while assisting its introgression into local breeds.

The roles of the *Trypanosoma brucei* P2 adenosine transporter (*TbAT1*) in drug uptake and resistance determined through gene knockout.

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Abstract

The mechanisms by which pathogens become resistant to chemotherapeutic agents are generally not well understood. In *Trypanosoma brucei*, the uptake of the diamidine and melaminophenyl arsenical classes of drug is thought to be mediated by the P2 adenosine transporter, encoded by *TbAT1*.

Objective: A *TbAT1* null mutant was constructed to assess the role of this transporter in drug uptake and resistance.

Results: The absence of P2 transport activity in the mutant strain was confirmed by the lack of adenine-sensitive [^{3}H]adenosine uptake. Adenosine-sensitive [^{3}H]pentamidine transport was likewise absent in *ΔTbAT1*, though two additional pentamidine transporters, HAPT1 and LAPT1, were present. The null mutant was only slightly resistant to melaminophenyl arsenicals and pentamidine but highly resistant to diminazene aceturate. The lytic *in vitro* effects of melarsen oxide were delayed in the *ΔTbAT1* line, and the delayed lysis was adenosine-insensitive.

Conclusions: This study confirms TbAT1 involvement in drug resistance due to inability of mutant parasites to import lethal concentrations of arsenical during treatment. Presence of HAPT1 and LAPT1 explains the apparent absence of pentamidine resistance in the field despite use of the drug for decades.

The diagnosis of tsetse-transmitted animal trypanosomiasis. Sense and sensitivity.

Van den Bossche, P.[1, 2], Geysen, D.[1], Delespaux, V.[1], De Deken, R.[1], Brandt, J.[1], Berkvens, D.[1] and Geerts, S.[1]

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The diagnosis of trypanosomiasis is notoriously difficult. This is attributed mainly to the variations in the parasitaemia during the course of an infection affecting the sensitivity of parasitological diagnostic tests. Especially in the chronic stage, when parasitaemias are usually low, detecting an infection becomes difficult often leading to an underestimation of the prevalence of infections. Similarly, the sensitivity of parasitological tests to detect mixed infections is usually low.

The development of molecular diagnostic tools has improved significantly the sensitivity of the diagnosis of trypanosomiasis but has, at the same time, made diagnosis dependent on well-equipped laboratories. However, here also a minimum amount of parasite-DNA is required in the sample for infected animals to be identified as positive. Hence, the diagnostic sensitivity of molecular diagnostic tools may also be insufficient in the case of chronic infections with low parasitaemias.

To evaluate the diagnostic performance of available diagnostic methods and to determine their appropriateness in the course of a trypanosome infection, experimental single and mixed *T. brucei* and *T. congolense* infections in cattle were conducted. Blood samples were taken throughout the infection and analysed using different diagnostic tools. The results were compared and suggestions are made with respect to the appropriateness of diagnostic tools or combination of diagnostic tools depending on the aim of the diagnosis.

Finally, suggestions are made whether, in the absence of a gold standard, Bayesian methods can be used to make inferences about the prevalence of trypanosome infections in a population and the sensitivity and specificity of a diagnostic test.

S 2 4

Le diagnostic des trypanosomiases animales transmises par les mouches tsé-tsé

Van den Bossche, P.[1,2], Geysen, D.[1], Delespaux, V.[1], De Deken, R.[1], Brandt, J.[1], Berkvens, D.[1] and Geerts, S.[1]

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Le diagnostic des trypanosomiases animales est notoirement difficile. Ceci est causé surtout par la variation de la parasitémie au cours de l'infection, ce qui a des répercussions sur la sensibilité des tests diagnostiques. Dans le stade chronique, lorsque la parasitémie est généralement faible, la détection des animaux infectés est particulièrement difficile, ce qui aboutit à une sous-estimation de la prévalence de l'infestation. En plus, les tests parasitologiques montrent une faible sensibilité pour la détection d'infections mixtes.

Le développement d'outils de biologie moléculaire a amélioré significativement la sensibilité du diagnostic de la trypanosomiase, mais simultanément ce diagnostic est devenu dépendant des laboratoires bien équipés. Néanmoins, une quantité minimale d'ADN doit être présente dans l'échantillon afin que les animaux infectés puissent être identifiés comme positifs. Par conséquent en cas d'infections chroniques avec des parasitémies très faibles la sensibilité diagnostique des techniques de biologie moléculaire s'est parfois révélée insuffisante.

Afin d'évaluer la performance des techniques diagnostiques disponibles et de déterminer leur pertinence au cours d'une infection trypanosomienne, des infestations expérimentales simples et mixtes de *T. brucei* et de *T. congolense* ont été réalisées chez des bovins. Des échantillons de sang ont été examinés en utilisant plusieurs techniques. Les résultats ont été comparés et des recommandations ont été formulées en ce qui concerne l'utilité des différents techniques de diagnostic ou la combinaison de plusieurs techniques en fonction de la finalité du diagnostic.

Enfin, il est conseillé d'utiliser des techniques Bayésiennes afin d'estimer la prévalence réelle des trypanosomiases en absence de méthodes de référence ('gold standard') et d'évaluer la sensibilité et la spécificité des techniques diagnostiques.

COMPARATIVE PATHOGENICITY OF THREE GENETICALLY DISTINCT TYPES OF *TRYPANOSOMA CONGOLENSE* IN CATTLE : CLINICAL OBSERVATIONS AND HAEMATOLOGICAL CHANGES.

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ABSTRACT

For the purpose of comparing the pathogenicity of African bovine trypanosomosis of the three genetic distinct types of Trypanosoma congolense (savannah, west african riverine/forest, and kilifi) Zebu cattle were subcutaneously inoculated with 10^5 organismes of each of them and daily controlled on one year for clinical signs, parasiteamias, packed red cell volume percentages and leukocytes counts. All the inoculated animals became parasitaemic between 7 and 11 days post-infection. Along the initial phase of infection, clinical sign were those of prostration, rough hair, inappetance and and rapid respiration and were similar in the three groups. In the savannah –type infected group, the initial symptoms were associated with constant high parasiteamias and irreversible decreasing packed red cell volume percentages and leukocytes counts and all animals were dead between 29 and 54 days post-infection; during the last phase of infection, animals showed consistently diarrhoea, lacrimation and paralysis. In the forest-type infected group, the initial symptoms and haematological changes were similar to those described previously, but they decreased gradually concomitantly with the decrease of the parasiteamias one month following the infection and all the animal self-recovered their normal hematologic and body conditions after three post-infection. In the kilifi-type infected group, the initial symptoms decreased gradually as in the forest-type infection but no haematological alteration was observed along the control. These results indicated clear difference in pathogenicity between the three types of T. congolense; the savannah-type was virulent while the forest-type was of low pathogenecity and the kilifi-type seems to be non-pathogenic.

Keywords : Trypanosoma congolense; three genetic types; Pathogenicity ; Zebu cattle.

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In vivo effect of Ethidium alone or combined with Quinapyramine on *Trypanosoma evansi* resistant strain to Quinapyramine

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Abstract

To assess the effect of the drug Ethidium on the resistant strain of *T. evansi* to Quinapyramine, 16 albino mice were infected with 5 x 10^5 Trypanosomes Intraperitoneal and grouped as follows:

Group (1) consisted of 5 mice infected with *T.evansi* and treated by Ethidium (1 mg / Kg B.W.), and 2 uninfected mice treated with the same dose of Ethidium.

Group (2) consisted of 5 mice, infected with *T.evansi* and treated by Ethidium (1 mg / Kg B.W.) and Quinapyramine (Triquin ®) (4.17 mg / kg B.W.) and 2 uninfected mice treated by Ethidium and Quinapyramine with the same doses.

Group (3) consisted of 2 mice infected with *T.evansi* and untreated. Parasitaemia of all infected mice in the three groups was followed every 2 days.

The infected treated mice in group (1) died within day 10 – 26 post treatment, while the uninfected treated mice in the same group survived until the end of the study (8 weeks).

In group (2), two of the infected treated mice died on day 13, while the uninfected treated mice survived until the end of the study (8 weeks).

In group (3) the 2 infected mice in this group died in day 8 and 15 respectively.

We concluded that Ethidium had no effect on *T. evansi* resistant to Quinapyramine alone or combined with Quinapyramine.

PATHOGENICITE COMPAREE DE TROIS TYPES GENETIQUES DISTINCTS DE TRYPANOSOMA CONGOLENSE CHEZ LES BOVINS : OBSERVATIONS CLINIQUES ET ALTERATIONS HEMATOLOGIQUES.

[1]BENGALY Z., [1]SIDIBE I., [1]GANABA R., [1]DESQUESNES M., [2]BOLY H. and [2]SAWADOGO L.

RESUME

Dans le but de comparer la pathogenicité chez les bovins des trois types génétiques distincts de l'espèce *Trypanosoma congolense* (type savane, type forêt et type kilifi), des bovins de race Zébu ont été inoculés par voie sous-cutanée avec 10^5 organismes de chacun d'eux, et ont été soumis à un contrôle quotidien pendant une année pour évaluer les signes cliniques, la parasitémie, le taux d'hématocrite,la leuco-concentration, et la formule leucocytaire. Les trypanosomes ont été détectés chez tous les animaux inoculés entre 7 et 11 jours post-infection. Au cours de la première phase de l'infection, les signes cliniques étaient représentés par la prostration, le poils piqué et le manque d'appétit, et étaient identiques dans les trois groupes infectés. Chez les bovins infectés par le type savane, les symptômes initiaux étaient associés à des niveaux constamment élevés de parasitémie et une chute progressive et irréversible du taux d'hématocrite, de la leuco-concentration, et des différents leucocytes, et tous les animaux sont morts entre les 29^{è} et 54^{è} jour post-infection ; au cours de la phase terminale, les animaux montraient constamment de la diarrhée, des lacrimations et une parésie des membres. Chez les animaux infectés par le type forêt, les symptômes et les altérations hématologiques initiaux étaient identiques à ceux décrits précédemment, mais ils disparaissaient progressivement concomitamment avec la chute progressive de la parasitémie après un mois d'infection, puis tous les animaux recouvraient leurs constantes hématologiques et leur état général initial après trois mois d'infection. Chez les bovins infectés par le type kilifi, les signes clinques initiaux évoluent comme dans l'infection par le type forêt, mais aucune altération hématologique n'est observée tout au long de l'étude. Ces résultats indiquent clairement que ces trois types génétiques distincts de *T. congolense* présent des niveaux de pathogénicité différents ; le type savane est très pathogène tandis que le type forêt est faiblement pathogène et le type kilifi semble non pathogène pour les bovins.

Mots-clé : Trypanosoma congolense ; trois types génétiques distincts ; pathogénicité ; bovins Zébu

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5 2 1

Drug sensitivity studies on *Trypanosoma simiae* and *T. congolense* infections in pigs.

by
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ABSTRACT

Studies were carried out in pigs to determine the drug sensitivity of *T. simiae* KETRI 2730 in comparison with *T congolense* ADRI and *T. congolense* IL 3575 putatively resistant and sensitive to diminazene aceturate respectively. Pigs infected with these stocks of trypanosomes were treated with diminazene aceturate single dose or three doses (at 48 hour intervals). It was shown that relapse infection occurred in pigs infected with the putative drug sensitive stock *T. congolense* IL 3575 after treatment with diminazene aceturate 3.5 mg/kg while with increase of the single dose to 7.0 mg.kg no relapses occurred. Single dose treatment of *T. congolense* ADRI with diminazene aceturate at 3.5 and 7.0 mg/kg dose rate led to relapse infections while triple treatment (48 hour intervals) at 7.0 mg/kg dose rate resulted in no relapses at least for an observation period of 60 days. Single and triple treatment (48 intervals) of *T. simiae* KETRI 2730 at 7.0 mg/kg dose rate resulted in relapses while triple treatments (48 hour intervals) at 12.4 – 14 mg/kg dose rate resulted in no relapses being detected up to 80 days post last treatment. This finding corroborates previous findings on superior efficacy of divided doses on putative drug resistant trypanosomes and if confirmed in further drug sensitivity studies on *T. simiae* infections, could have far-reaching impact on management of *T. simiae* outbreaks in pigs.

Biological assay of Deltamethrin based sprays and pour-on formulations for controlling tsetse flies (Diptera: Glossinidae)

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ABSTRACT

Various pyrethroid based insecticide formulations have been used to control tsetse and trypanosomiasis. However the use of dips has remained restricted due to high costs compared with anticipated returns. Locally manufactured formulations of deltamethrin based dips and pour-on formulations were biologically assayed at Rukomichi Research Station in the dry season and the wet season. Individual animals were treated with and effectiveness and performance evaluated over a period of time. *Glossina pallidipes* females were allowed to feed naturally and caught with a hand net after feeding. Knockdown, mortality and feeding site of caught tsetse flies were recorded. The results show that new formulations have a marginally lower (10%) effectiveness than currently available products, but may offer affordable options for tsetse control in low-income regions of Africa. 90 % of tsetse caught fed on the lower parts of the leg. There was no significant modification of tsetse feeding site on animals treated with new formulations, old formulations or the control. The results also show that persistent rains have a greater impact than sporadic downpours. The implications of minimum insecticide use through the application of pour-on to selected animals as well as to ideal sites on the animal discussed.

602 STAINABLE SETTLEMENT IN TSETSE CONTROLLED DIDESSA VALLEY IN ETHIOPIA - MIRESSA KENO
(Paper Awaited)

604

THE ROLE OF COMMUNITY PARTICIPATION ING. TACHI-NOIDES CONTROL IN ETHIOPIA (Paper Awaited

605 COMMUNITY INVOLVEMENT IN TSETSE CONTROL ACTIVITIES EXPERIENCE IN **TANZANIA** – JOYCE W.S. DAFFA

6 U 6

Le diagnostic des trypanosomiases animales transmises par les mouches tsé-tsé

Van den Bossche, P.[1,2], Geysen, D.[1], Delespaux, V.[1], De Deken, R.[1], Brandt, J.[1], Berkvens, D.[1] and Geerts, S.[1]

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Afin d'évaluer la performance des techniques diagnostiques disponibles et de déterminer leur pertinence au cours d'une infection trypanosomienne, des infestations expérimentales simples et mixtes de *T. brucei* et de *T. congolense* ont été réalisées chez des bovins. Des échantillons de sang ont été examinés en utilisant plusieurs techniques. Les résultats ont été comparés et des recommandations ont été formulées en ce qui concerne l'utilité des différents techniques de diagnostic ou la combinaison de plusieurs techniques en fonction de la finalité du diagnostic.

Enfin, il est conseillé d'utiliser des techniques Bayésiennes afin d'estimer la prévalence réelle des trypanosomiases en absence de méthodes de référence ('gold standard') et d'évaluer la sensibilité et la spécificité des techniques diagnostiques.

The diagnosis of tsetse-transmitted animal trypanosomiasis. Sense and sensitivity.

Van den Bossche, P.[1,2], Geysen, D.[1], Delespaux, V.[1], De Deken, R.[1], Brandt, J.[1], Berkvens, D.[1] and Geerts, S.[1]

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The development of molecular diagnostic tools has improved significantly the sensitivity of the diagnosis of trypanosomiasis but has, at the same time, made diagnosis dependent on well-equipped laboratories. However, here also a minimum amount of parasite-DNA is required in the sample for infected animals to be identified as positive. Hence, the diagnostic sensitivity of molecular diagnostic tools may also be insufficient in the case of chronic infections with low parasitaemias.

To evaluate the diagnostic performance of available diagnostic methods and to determine their appropriateness in the course of a trypanosome infection, experimental single and mixed *T. brucei* and *T. congolense* infections in cattle were conducted. Blood samples were taken throughout the infection and analysed using different diagnostic tools. The results were compared and suggestions are made with respect to the appropriateness of diagnostic tools or combination of diagnostic tools depending on the aim of the diagnosis.

Finally, suggestions are made whether, in the absence of a gold standard, Bayesian methods can be used to make inferences about the prevalence of trypanosome infections in a population and the sensitivity and specificity of a diagnostic test.

Paper for Animal trypanosomosis

Diagnosis

TrypS.

Comparison of live bait technology and traps intergrated with curative or prophylaxis treatment for control of nagana in Mukono district, South East Uganda.

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Objective: This study was designed to establish the most effective integrated control approach for nagana in Uganda.

Methodology: The efficacies of pyramidal lancien traps or deltamethrin pour-on combined with animal treatment using diminazene aceturate/isometamidium chloride were investigated in Mukono district, South East Uganda.

Following introduction of various treatment combinations, animal trypanosomosis incidence, packed cell volume (PCV), body and hair conditions were monitored every month for one year. At the same time tsetse apparent densities and infection rates were determined.
Results: Over this period, there was 100% and 63% reductions in animal prevalence for cattle treated with isometamidium and diminazene respectively. In addition, the PCV values improved by 17.7%, 10.6%, 30.2%, 14.5% for traps/ diminazene aceturate, traps/ isometamidium chloride, deltamethrin/diminazene aceturate and deltamethrin/isometamidium chloride combinations respectively.
Conclusion: Overall, our results show that combining Isometamidium chloride treatment with deltamethrin application to cattle offers the best protection against trypanosomosis. The advantages and disadvantages of each of the technology combinations are discussed.

Poster.

① If the PCV improvements are considered Reportedly the order is deltamethrin/isometamidium then 14.5% (= NOT 30.
② Use of pour-on - isometamidium combination would be expensive compared to other available approaches. May be the approach could be used with curative instead of prophylactic.

- Paper needs to be re-written as it is now.

Glossina pallidipes Distribution Belt in South-East Uganda is not limited to the Kenya-Uganda border.

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**District Entomologist Office Iganga; **FITCA, Entebbe, Uganda.*

ABSTRACT

The geo-referenced mapping of *G. pallidipes* distribution belt, in six districts of S. E. Uganda shows that many grids with *G. pallidipes* infestation also have more *T. congolense* and *T. brucei* infections in cattle. The re-description of distribution belt in the FITCA area has continued to provide baseline data and train district Entomologists and allied tsetse control extension staff to implement appropriate tsetse control, rural development and land-use practices to promote modernization of livestock farming where two tsetse species co-exist. Activities in over 200 grids in the districts of Mbale, Tororo, Busia, Bugiri, Iganga and Kamuli have continued to show that *G. pallidipes* pockets are scattered and unlimited, but with FTDs below 10. Within SE Uganda, while the *G. pallidipes* foci traverses *G. f. fuscipes* belt, detection methods have been more focussed towards the later. It has also now been confirmed that the *G. pallidipes* distribution belt is not restricted to the Kenya-Uganda border as previously assumed especially during the last quarter of the last century when a sleeping sickness epidemic had once again ripped SE Uganda.

We report under-estimation of the *G. pallidipes,* a major vector of animal trypanosomosis as confirmed by veterinary surveys and geo-referenced mapping.

Strategies for tsetse control of these two co-existing tsetse species should focus on training various stakeholders on integrated tsetse management approaches and other options, with insecticide-impregnated odor-baited tsetse fly traps and live-bait pesticide formulations.

E, F

Approche quantitative du maintien de Trypanotolérance des taureaux N'Dama (*Bos Taurus*) en Gambie

O.O. Akinbamijo[i], *R.A. Pearson* [ii] *& A. Fall*[i]

Résumé

Le bien-être et le gagne-pain de beaucoup de foyers ruraux dépendent de la santé de leurs animaux de trait. Ils comptent sur ces animaux pour les besoins de main-d'œuvre dans la ferme, pour le transport de la récolte agricole, et beaucoup d'autres formes diverses de transport. Dans ce rôle crucial dans la vie et l'économie des populations pour la plupart agraires de l'Afrique de l'Ouest, il est impératif de comprendre le besoin en énergie des animaux de trait surtout lorsque l'environment est compliqué par le trypanosomose. Ce poster identifie le défi trypanosome et les complications de l'utilisation du bétail trypanotolérant pour le travail dans les zones écologiques infestées de tsé-tsé en Afrique Sub-Saharienne (ASS Les interactions qui existent entre l'alimentation, le travail et la trypanotolérance dans plusieurs types d'infection sont revisitées. Les ressources et pratiques alimentaires qui sont disponibles actuellement sont identifiées. Les auteurs soutiennent qu'avec l'alimentation de base offerte par les pâturages naturels en ASS, la plupart des animaux travailleurs couvriront à peine leurs besoins en maintien sans faire face aux besoins de travail. La complémentation alimentaire ne pourrait pas peut-être en elle-même empêcher la perte de poids quand les animaux travaillent, mais peut maintenir le rendement de la main d'œuvre, vitale pour la production de cultures alimentaires. La capacité à réduire les effets débilitants du trypanosomose à travers une alimentation appropriée et un équilibrage réaliste entre la charge de travail et les besoins correspondants en alimentation sont cependant cruciaux pour le processus trypanotolérant. Les effets synergistiques de travail et les demandes physiologiques de résistance aux maladies peuvent avoir un effet considérable sur le métabolisme hôte général même pendant les infections sub-cliniques. En ce qui concerne la trypanotolérance, tandis que des seuils quantitatifs pour le travail et l'alimentation sont proposés dans ce poster, des mesures chemo prophylactiques sont aussi considérées bénéfiques aux animaux de trait trypanotolérants surtout pendant les périodes de travail et de prévalence élevées de maladies.).

Mots clés : Trypanotolérance, trait, stratégies d'alimentation, travail

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Quantitative approaches to the maintenance of Trypanotolerance of working N'Dama (*Bos Taurus*) bulls in The Gambia

Poster abstract

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Summary

Livelihood and welfare of many rural households depend on the well-being of their draught animals. They depend on these animals for on-farm power requirements, transportation of farm produce, and endless varieties of forms of transportation. In this crucial role in the life and economy of mostly agrarian population in West Africa, it is imperative to understand the energy requirement of the draught animals especially where the environment is complicated by trypanosomosis. This poster identifies the trypanosomosis challenge and the complications of using trypanotolerant cattle for work in the tsetse-infested ecological zones in sub Saharan Africa (SSA). The interactions that occur between nutrition, work and trypanotolerance in various types of infection are reviewed. The current feeding resources and practices that are available are identified. The authors argue that with the basic nutrition offered by natural pastures in SSA, most working animals will barely cover their maintenance requirements without meeting the needs for work. Nutritional supplementation in itself may not prevent weight loss when the animals are working, but can maintain work output, important for food crop production. Crucial for the trypanotolerance process is however, the ability to reduce the debilitating effects of trypanosomosis through appropriate nutrition and a realistic balancing of work load with commensurate feed requirements. The synergistic effects of work and the physiological demands for disease resistance can have a significant effect on the general host metabolism even during sub-clinical infections. With respect to Trypanotolerance, while quantitative thresholds for work and nutrition are proposed in this poster, chemo prophylactic measures are also considered beneficial to trypanotolerant draught animals especially during work and high disease prevalence periods.

Keywords: Trypanotolerance, draught, feeding strategies, work

Gambia - Poster

Title of ... should include land use??

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Je voudrais présenter l'article ci-après :

Présentation orale :

Modélisation de la diffusion linéaire des glossines ripicoles en galerie forestière.

RÉSUMÉ :

Modèle de la diffusion linéaire des glossines ripicoles en galerie forestière.

Jérémy Bouyer [1 & 2], Alexandre Sibert[1&3], Marc Desquesnes[1 & 2] et Dominique Cuisance

1 CIRAD-EMVT, BP 5035, 34032 Montpellier, France
2 CIRDES, BP454, Bobo-Dioulasso, Burkina Faso
3 ISRA-LNERV, BP2057, Dakar-Hann, Sénégal

La répartition spatiale des populations d'insectes et son évolution dans le temps sont des questions cruciales lorsque ces insectes sont les vecteurs de pathogènes pour les animaux ou les végétaux. Au moins en terme de prédiction, les enjeux sont considérables.

La problématique de la dispersion des glossines ripicoles, vectrices des trypanosomoses animales et humaines, est d'actualité : l'élaboration de programmes de contrôle ou d'éradication efficaces nécessite une compréhension fine de l'écologie de ces vecteurs, et en particulier de la structuration géographique de leurs populations. À cette fin, les données de lâcher-recapture ainsi que les techniques récentes de génétique des populations sont des outils de choix.

Dans cette perspective, nous avons porté notre attention sur un jeu de données recueilli par D. Cuisance en 1980-1981 dans la région de Bobo Dioulasso. Plusieurs schémas de diffusion, dont certains intègrent la structure du réseau hydrographique, ont été étudiés afin de modéliser les données recueillies par l'auteur. Leur objectif est de proposer des protocoles simplifiés de lâcher-recapture permettant d'estimer les paramètres de diffusion, en particulier à grande distance, de populations naturelles en situations variables (paysages écologiques plus ou moins favorables).

Il apparaît possible de déduire les mouvements d'une population de glossines donnée à partir d'un faible nombre de captures réalisées suite à une séance de lâcher, ces séances servant à étalonner puis à valider le modèle. Il est cependant nécessaire de réitérer ces lâchers à différentes saisons et pour différentes catégories de population (sexe, âge, état physiologique) et de tenir compte de l'évolution des paysages écologiques pour espérer poser des hypothèses de diagnostic de situation, qui feront l'objet de vérifications par des études de génétique des populations.

SUMMARY :

A predictive model for linear diffusion of riverine forest tsetse flies.

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Abstract :

Knowledge and prediction of spatial distribution of insect populations and its evolution is very important in the case of insects which are vectors of plant or animal pathogens. Dispersion of the riverine forest *Glossina* species is of a great concern especially since they are the main cyclical vectors of human and animal trypanosomes. Design of control and/or eradication programmes requires an acurate knowledge of their ecological preferences and the geographic structure of their populations. In this aim, datas on releasing-retrapping as well as modern genetic population analyses are the favored tools.

As a first step an enormous data collection generated by D. Cuisance in the 80s in the area of Bobo-Dioulasso Burkina Faso has been recently analysed. In these experiments a series of models based on regular time and space collection including the structure of the hydrographic network have been proposed to explain the observed data. The objective is to propose a simplified model of releasing-retrapping allowing to estimate diffusion especially at long distance of natural tsetse populations in various situations (ecological landscapes favourable or not).

Movements of the tsetse populations were predictable on the basis of a small number of releasing-retrapping. These experiments allowed to standardize and validate the mathematic model. It is however necessary to carry out several experiments at various seasons and with various types of the flies (sexe, age, physiological status). It is also important to evaluate the evolution of the landscape for a reliable diagnostic of the situation especially in the case of isolated tsetse populations which isolation would be confirmed by genetic studies.

Burkina Faso / France (Oral)

Not very clear, unless but a good concept.
Author to refine English version, Suitable for oral.

POSTER PRESENTATION

A SOCIO-ECONOMIC STUDY ON THE CHOMA-KALOMO BLOCK AERIAL SPRAY TSETSE CONTROL OPERATIONS OF 1987 – REPORT APRIL 2002.

SUMMARY

A Socio-economic survey on the Choma-Kalomo Block Aerial Spray Tsetse Control Operations was conducted between October 2001 and April 2002.
The Overall objective of the study was to determine the socio-economic gains and effects resulting from a sequential tsetse control operations that were conducted in the Choma-Kalomo block, southern province, Zambia in 1987.

Evidence from the survey suggests that control operations were financially and economically rational because of the multiple indirect and direct economic gains that were realised from the area. The indirect benefits included; crop out put increased/marketing points and social amenities increased (Schools, Health centres, water wells, roads). The direct benefit included; Increase in livestock population (from 22,000 to 67,000), calving rates (from 10% to 23%) and decrease in mortality rates (from 7% to 3%).

Tsetse clearance enhanced the carrying out of agricultural activities, as trypanosomiasis, which was a constraint to livestock and crop production was almost eradicated (brought almost to zero percent).

Dr. Joseph Mubanga
Zambia

Zambia - Poster

Evaluation de la chimiorésistance des trypanosomes dans la zone sub-humide et cotonnière de l'Afrique de l'Ouest.

Auteurs : Diall O[1], Clausen P-H[2], Diallo B[3], Muenstermann S[4], Bocoum Z[5], Diarra B[6], Barry A.M[4], Bengaly Z[7], Affognon H[8], Randolph T[9], McDermott J[9].

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6.Unité Centrale de lutte contre les tsetse et la Trypanosomose, Bamako
7. CIRDES, Bobo Dioulasso, Burkina Faso.
8. University of Hannover, Germany
9. International Livestock Research Institute, Nairobi

La Trypanosomose Animale Africaine constitue une contrainte majeure au développement de l'Elevage en zone sub-humide et cotonnière d'Afrique de l'Ouest. Pour lutter contre la Trypanosomose, les producteurs s'appuient essentiellement sur l'utilisation des produits trypanocides, l'Isometamidium en guise de préventif et le Diminazène en guise de curatif.

Des études antérieures ont montré la limite de tels traitements en révélant des foyers de chimiorésistance dans certains pays de la sous-région, notamment au Burkina.

La contention du phénomène nécessite l'accès à des moyens de diagnostic rapide de la chimiorésistance sur le terrain. A cet effet, une approche a été testée en deux phases au Mali et en Guinée. La première phase a consisté à identifier les villages à haut risque de trypanosomose et utilisation importante de trypanocides, grâce à une enquête transversale combinant BCT, piégeage et un questionnaire sur les trypanocides. Cette enquête a permis d'identifier 7 villages sur 25 au Mali et 3 villages sur 30 en Guinée avec une prévalence $\geq$10% et une utilisation importante de trypanocides. Des villages identifiés au cours de la première phase, comme foyers potentiels de chimiorésistance, il en a été choisi 5 au Mali et 3 en Guinée à soumettre, dans la deuxième phase, à une étude longitudinale d'évaluation de l'efficacité des traitements à l' Isometamidium et au Diminazène.

En ce qui concerne l' Isometamidium, 50 bovins de chacun des villages retenus ont été traités à la dose préventive recommandée (1mg/kg) et comparés à 50 autres bovins témoins non traités. Un suivi des infections a été réalisé durant 8 semaines avec des contrôles toutes les deux semaines et traitement curatif des positifs des deux groupes au Diminazène à la dose de 3.5mg/kg, mais portée à 7mg/kg pour les cas à *T.brucei*.

L' efficacité du Diminazène a, quand à elle, été évaluée, en fonction de la résorption ou non des infections, 14 jours après les traitements curatifs, durant la même période.

Cette méthode a permis de mettre en évidence différents niveaux de résistance aux deux produits au Mali, comme en Guinée . Ces résistances deviennent manifestes déjà au cours des 4 premières semaines de suivi ; d'où l'idée de recommander un protocole simplifié de 4 semaines au lieu de 8. Ce nouveau protocole est en cours d'évaluation dans les mêmes pays.

Mali

- This paper is apparently animal trypanosomosis on use of trypanocides. Need English Version.
- Dr. Bauer to Rd and re-discussion.

Abstract for the 27th ISCTRC meeting, Pretoria, South Africa, 2003

Trypanocidal drug efficiency in trypanotolerant cattle in a high challenge area of The Gambia

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International Trypanotolerance Centre, PMB 14, Banjul, The Gambia

Abstract

Trypanosomosis of domestic animals is endemic throughout The Gambia. Nearly 50% of the country is under medium to very severe trypanosomosis challenge. Although 99.6% of cattle are trypanotolerant N'Dama, clinical trypanosomosis is widespread and the use of trypanocides, particularly diminazene aceturate, is the commonest control strategy. It is estimated, that up to 50% of the trypanocides used in 2002 where imported by Government accredited pharmacies and that the other 50% come into the country illegally.

The study reported here was carried out to test for the existence of trypanocide resistance particularly to diminazene aceturate in a high challenge area. A group of 50 cattle was given a block treatment of Berenil® at a 14-day interval over a period of 14 weeks, while 50 animals in the control group received treatment only when parasitologically positive. During the study period no trypanosome infection could be detected in the treatment group, while the mean prevalence in the control group was 10% (range 4 –14%).

During the same period three sentinel herds grazing close to the experimental herd, showed similar trypanosome prevalences. Interviews were carried out with 127 farmers in this area to determine their usage and knowledge of trypanocides. Amongst those farmers, 37% called a livestock assistant to treat sick animals and did not buy drugs or treat animals themselves, whereas 35% bought the drugs and called a livestock assistant for treatment, whilst 28% bought drugs and treated themselves. The overall level of knowledge of farmers on the use of trypanocides was poor.

A sample of 28 trypanocides, all diminazene aceturate based, was collected from surrounding markets and tested for quality. Fifteen percent of the samples (one product only) did not fulfil quality specifications.

It was concluded that, although a number of risk factors existed in the area, there was no evidence of drug resistance.

Gambia (Not Kebe Control)

- Animal trypanosomosis
- Single drug sensitivity design
- Community awareness of use of drugs

Efficacité trypanocide chez le bétail trypanotolérant, dans une zone à haut risque en Gambie

Abstrait

Le trypanosomose des animaux domestiques est endemique partout en Gambie. Presque 50% du pays est sous risque trypanosomosien dit moyen à très sévère. Bien que le N'Dama trypanotolérant constitue 99,6% du bétail, le trypanosomose clinique est répandu et l'utilisation de trypanocides, surtout de diminazene aceturate, est la stratégie de contrôle la plus connue. Il est estimé que jusqu'à 50% des trypanocides utilisés en 2002 étaient importés par des pharmacies accréditées par le Gouvernement, et que les 50% restants sont venus de manière illégale dans le pays.

La présente étude a été menée pour vérifier l'existence de résistance trypanocide particulièrement à diminazène aceturate dans une zone à haut risque. Un traitement block de Berenil® a été donné à 50 animaux à 14 jours d'intervalle durant une période de 14 semaines, tandis que 50 animaux du groupe témoin ont reçu du traitement uniquement en cas de parasitologie positive. Durant la période, aucune infection trypanosomienne n'a été detectée chez le groupe de traitement, tandis que la prévalence moyenne dans le groupe témoin était de 10% (tranche 4 – 14 %).

Durant la même période, trois troupeaux surveillés en patûrage près du troupeau expérimental ont montré les mêmes prévalences trypanosomiennes. Les interviews ont été menés avec 127 éleveurs dans cette zone pour déterminer leur utilisation et connaissance des trypanocides. Parmi ces éleveurs, 37% ont fait appel à un auxilliare pour traiter les animaux malades et n'ont pas acheté les médicaments ni traité les animaux eux-mêmes, tandis que 35% ont acheté les médicaments et fait appel à un auxilliaire pour le traitement, alors que 28% ont acheté les médicaments et traité les animaux eux-mêmes. La niveau de connaissance en général des éleveurs sur l'utilisation des trypanocides était bas.

Un échantillon de 28 trypanocides, tous à base de diminazene aceturate, a été recueilli des marchés avoisinants et analysé pour la qualité. Quinze pourcent des échantillons (seulement un produit) n'ont pas rempli les spécifications de qualité.

Il a été conclu que, même si des facteurs de risque existent dans la zone, il n'y a pas eu d'évidence de resistance à diminazene aceturate.

Drug sensitivity studies on *Trypanosoma simiae* and *T. congolense* infections in pigs.

by
By RD Fyumagwa and RS Silayo
Sokoine University of Agriculture,
Dept of Vet. Microbiology and Parasitology,
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ABSTRACT

Studies were carried out in pigs to determine the drug sensitivity of *T. simiae* KETRI 2730 in comparison with *T congolense* ADRI and *T. congolense* IL 3575 putatively resistant and sensitive to diminazene aceturate respectively. Pigs infected with these stocks of trypanosomes were treated with diminazene aceturate single dose or three doses (at 48 hour intervals). It was shown that relapse infection occurred in pigs infected with the putative drug sensitive stock *T. congolense* IL 3575 after treatment with diminazene aceturate 3.5 mg/kg while with increase of the single dose to 7.0 mg.kg no relapses occurred. Single dose treatment of *T. congolense* ADRI with diminazene aceturate at 3.5 and 7.0 mg/kg dose rate led to relapse infections while triple treatment (48 hour intervals) at 7.0 mg/kg dose rate resulted in no relapses at least for an observation period of 60 days. Single and triple treatment (48 intervals) of *T. simiae* KETRI 2730 at 7.0 mg/kg dose rate resulted in relapses while triple treatments (48 hour intervals) at 12.4 – 14 mg/kg dose rate resulted in no relapses being detected up to 80 days post last treatment. This finding corroborates previous findings on superior efficacy of divided doses on putative drug resistant trypanosomes and if confirmed in further drug sensitivity studies on *T. simiae* infections, could have far-reaching impact on management of *T. simiae* outbreaks in pigs.

NOT tsetse in TZ

Tanzania

- This is a very important paper
- A paper should be published soon for easier understanding

THE EVALUATION OF DELTAMETHRIN APPLICATION TO CATTLE AS MEANS OF TSETSE CONTROL IN THE HONDE VALLEY COMMUNAL AREA, MUTASA DISTRICT, MANICALAND PROVINCE, ZIMBABWE.

A. MHINDURWA

Tsetse and Trypanosomiasis Control Branch, Department of Veterinary Services,

P. O. Box CY 52, Harare, Zimbabwe.

ABSTRACT

Deltamethrin application to cattle on a weekly basis at 0.075% concentration as recommended for tick control was conducted for more than eighteen months in the Honde Valley (Holdenby) Communal Area, Zimbabwe, from six dips that had recorded trypanosomiasis disease. The distribution of tsetse flies and the disease in the 511 sq. km area pre-treatment had a similar pattern. After five months of deltamenthrin treatment to cattle, 7-8 head of cattle per sq. km, the flies were confined to 1-3 km band from the Zimbabwe/Mozambique international border, covering 77 sq. km. The area reclaimed after five months on deltamethrin treatment was 434 sq. km (85%). A drop of 27% and 100%, and 73% and 100% *G. austeni* and *G. pallidipes* with fixed Epsilon trap was realised in the fifth and tenth month of deltamethrin treatment, respectively. Thereafter, *G. austeni* and *G. pallidipes* distribution was confined to the Mozambique border with not more than three tsetse flies being caught in supplementary Epsilon traps only from the tenth to the eighteenth month of treatment in the whole trial area. *G. morsitans* were caught in

ultra-low densities only in the first hot dry to wet period before treatment and in the second hot dry to wet period of the first treatment. A similar trend was observed with the trypanosomiasis challenge that dropped by 81% after five months of treatment. Wet and dry smears were the trypanosomiasis surveillance method used. Results were all negative as from the tenth month of treatment. Since no integrated tsetse control approach was conducted in this area, cattle dipping offered itself as a simple and cost-effective control strategy for the bovine trypanosomiasis disease and its vector when compared to targets that are six times more expensive and do require constant and highly technical supervision.

Zapalzine — Oral preparation

Prevents effect of Diabetic drug dip with deltamethrin 0.05% — also good for ticks weekly

No use of prophylaxis of isometamidium

Good for oral preparation.

Evaluation of the efficacy of new deltamethrin-based insecticide formulations against *Glossina pallidipes* in Kenya

S. Okoth, B. Bett, and L. Munga

Kenya Trypanosomiasis Research Institute, P. O. Box 362, Kikuyu.

The efficacy of three new deltamethrin-based insecticide formulations against laboratory-reared non-teneral *Glossina pallidipes* were evaluated. The formulations comprised a ready to use pour-on (Delete™), an emulsifiable concentrate (Butox™) and a tablet (Deltab™), applied at 500 PPM, 25 PPM and 200 PPM, respectively. Five groups of cattle, each made up of three Boran steers were used in the study. The first three groups were treated with the new formulations while the fourth group was on untreated control, and for comparison, the fifth group was treated with another deltamethrin EC formulation (Decatix™), which is already registered for use in Kenya. Groups of 10 male flies were allowed to feed for 15 minutes on the flanks of the steers on a weekly basis. Knockdown and mortality of flies were recorded during each feeding session from week 0 to week 7, and thereafter at specific time intervals for 24 hours. Feeding success was scored based on visual observation of engorgement status. All the insecticides caused at least 50 percent knockdown and mortality within varying durations from day 0 to 14. Flies exposed to Delete™ and Decatix® showed significantly reduced survival up to day 21, whereas those exposed to Deltab™ showed reduced survival up to day 28 when compared to untreated controls. The new products compared well with Decatix® in terms of knockdown, survival and mortality of flies, Deltab™ being marginally superior although the difference was not significant. None of the insecticides significantly inhibited feeding success although a high proportion of flies (28.7 %) only fed to quarter-capacity. The products were therefore considered to be efficacious against *Glossina pallidipes* under laboratory conditions and further evaluation under field conditions was recommended.

Kenya - Oral will advantage! (NST well done

- Experimental design good
- What happened to the ones in the ~~trypanosomes~~ abstract??
- Marginally superior with no statistical significance
  For simple way to define a trend

1 = Oral will advantage.

Towards the success of community based tsetse and trypanosomosis control in Kathekani location, Makueni district, Kenya

Ngare Paul, Kiragu J., Munga L. and Orenge C.
Kenya Trypanosomiasis Research Institute (KETRI), P. O. Box 362, Kikuyu, Kenya

Abstract
A study was carried out in Kathekani location, Makueni district in 2000-02 aimed at assessing levels of participation and perception with regard to tsetse and trypanosomosis control. The main economic activities in the area is smallholder livestock production mixed with rain-fed subsistence crop farming. A technology transfer community project funded by DFID through KETRI to enhance the capacity of local communities for sustainable control of trypanosomosis was initiated. The technology transfer stakeholders included KETRI, DFID, ITDG, MCC and the farmers. Entomological, epidemiological and socio-economic surveys were carried out and formed the basis for advice to the community on deployment of traps and disease control. Well-structured committees were formed to run the project. Trap monitors and supervisors were appointed to periodically record tsetse catches and assess trap conditions. The main findings show that the most common diseases in the area include trypanosomosis, tick borne diseases (anaplasmosis) and helminthosis. Results also indicate that the area is infested with *Glossina pallidipes, G. longipennis and G. brevipalpis.* The community was able to make 215 modified NGU traps. Trypanosomosis prevalence fluctuated between seasons and any lapses in the control by the community was usually reflected in increased prevalence. The community attests that there has been a substantial reduction in the cost of treating animals with increased herd sizes and improved breeds of goats. Cases of irritating tsetse bites to human and livestock have also reduced. However, sustainability problems are eminent, as farmer's contributions in terms of cash have been low due to poverty. Tsetse control being a public good brings the problem of free riders. The success of any community project will depend on the perception, available resources and magnitude of the problem. Again policy-makers need to understand environmental circumstances under which a given technology is to be implemented for sustainability.

NGO-Non Governmental Organization
DFID-UK'S Department for International Development
ITDG-Intermediate Technology Development Group
MCC-Mbungo Central Committee

LUTTE CONTRE LES GLOSSINES RIVERAINES AU BURKINA FASO : EFFICACITE D'UNE INTERVENTION INTEGREE ET CIBLEE SUR LES POINTS LES PLUS DANGEREUX.

Stéphane de La Rocque[1,2], Wilfried Yoni[2], Thomas Balenghien[2], Jérémy Bouyer[1,2], Idrissa Kaboré[2], Marc Desquesnes[1,2], M. Kamuanga[2,3]

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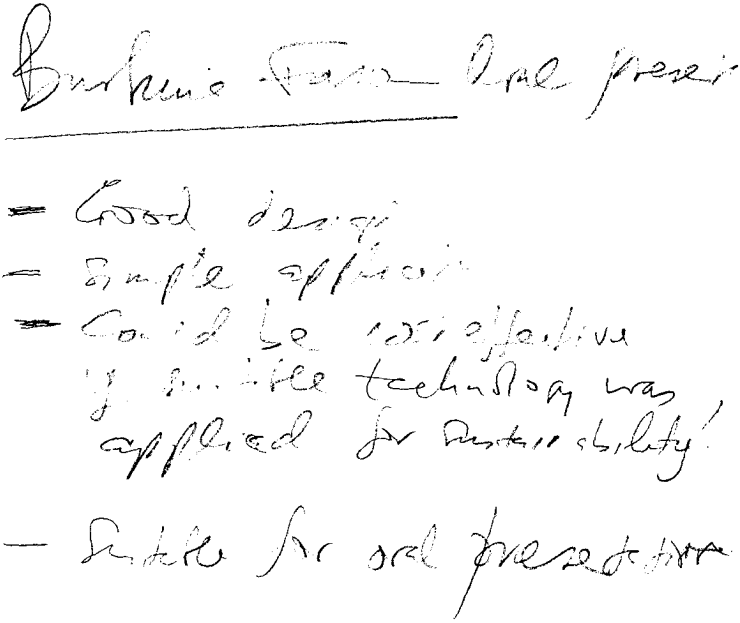
Les importants travaux menés depuis plusieurs décennies sur la lutte contre les glossines ont permis aujourd'hui de disposer d'un arsenal technique diversifié, qui a fait à maintes reprises les preuves de son efficacité. Cependant son application souffre régulièrement de l'étendue des zones à traiter, et en conséquence des difficultés de transfert et d'appropriation de ces technologies par les bénéficiaires locaux.
Des travaux menés ces dernières années dans les paysages soudano-guinéens d'Afrique de l'Ouest (zone de Sidéradougou, Burkina Faso) ont permis de développer des méthodologies permettant de mettre en évidence les zones de transmission des trypanosomes. Ces zones épidémiologiquement dangereuses correspondent aux interfaces, dans le temps et dans l'espace, les plus intenses entre le bétail et les vecteurs. Elles ne représentent qu'une portion réduite de la zone de répartition des glossines.
Une lutte ciblée, limitée à ces zones épidémiologiquement dangereuses, a été appliquée durant les deux dernières années. Dans 3 sites identifiés dangereux par le modèle et séparés de plusieurs kilomètres, un nombre très limité d'écrans ont été disposés sur quelques centaines de mètres. Des applications de formulations pour-on ont été effectuées durant la saison pluvieuse sur les troupeaux sédentaires résidant à proximité. Ce dispositif minimum a permis de diminuer rapidement la densité des populations locales de glossines, malgré les recolonisations par les zones adjacentes. Le suivi de troupeaux sentinelles a mis en évidence une rupture des cycles parasitaires. Les résultats obtenus sur un site témoin, situé à plusieurs kilomètres des sites de lutte, indiqueraient un effet à distance du dispositif. Sa légèreté et son efficacité ont été des éléments déterminants pour la prise en charge de la lutte par les populations locales, qui, moyennant quelques ajustements techniques, se sont organisées et appropriées les méthodes et les acquis. Certaines différences d'appropriation, tenant essentiellement à des raisons socio-culturelles, sont discutées.

EFFICIENCY OF AN INTEGRATED AND TARGETED CAMPAIGN AGAINST RIVERINE TSETSE FLIES IN BURKINA FASO

Years of research have largely improved tsetse control, leading to a set of diversified technical efficient tools. However, campaigns often suffer from the wide size of the area to be controlled and the cost of the protocols, with consequently difficulties for appropriation by the local beneficiaries and sustainability. Recent studies conducted in the Sidéradougou area (Burkina Faso) during the last years have described methodologies to highlight the sites where trypanosomes are transmitted. These "epidemiological dangerous sites" are located where the contact between cattle and riverine tsetse is the most regular and finally concern a very limited part of the flies distribution area.
A targeted control campaign, limited to these dangerous sites, was applied during the two last years. In 3 sites identified by the model and located several kilometers one from the other, a limited number of screens were laid out on a few hundreds of meters distance. Pour-on insecticide applications were applied during the rainy season on sedentary herds residing in

the vicinity. With such a limited protocol, local tsetse densities rapidly decreased, despite reinvasions by flies from the adjacent zones. Surveys in sentinel herds proved that trypanosomes transmission was disturbed and finally stopped few months after the beginning of the campaign. Results in a no-control site, located several kilometers from the others, indicate a potential distant effect.

The efficiency and the limited input of this protocol were determining elements for its appropriation by the local communities, with some technical adjustments. Differences in the answers of various communities are discussed, especially in their socio-cultural aspects.



EVALUATION OF A NEW TRAP FOR TABANIDS AND STOMOXYINES

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Abstract

The impact of tsetse flies in the transmission of trypanosomes has long time masked that of mechanical vectors. Tabanids and stomoxyines have direct effects (cutaneous lesions, blood spoliation, sound and visual harassment, etc.) and indirect effects (transmission of pathogenic agents) on livestock which can have significant medical and economical impact.

In West Africa, trapping of mechanical vectors has generally been made with tsetse fly traps. Only the Nzi trap, developed in Kenya by Mihok, is considered more effective in trapping tabanid flies. For stomoxyines it is the Vavoua trap (monoconic).

The authors compared trapping performances of a new trap (so-called Tetra), conceived and developed by Desquesnes at CIRDES, with Nzi trap. During one year, both traps have been used every two days and regularly rotated to collect insects in Lahirasso, Burkina Faso.
Out of 17,991 tabanids trapped, 62.7% of them were caught by the Tetra trap and 37.3% by the Nzi trap, and out of 2,149 stomoxyines trapped, 53.9% of them were caught by the Tetra trap and 46.1% by the Nzi trap. Results showed that the Tetra trap is an effective tool to be recommended in the capture of mechanical vectors specially tabanids.
A collection of tabanids caught on this occasion is available at CIRDES, as well as a booklet of information and identification of the most common West African Tabanids.

Key words : Tetra trap, Nzi trap, Mechanical vectors, Tabanids, Stomoxyines, Burkina Faso

Burkina Faso (oral)

— A good presentation
— Results need more statistical analysis prior to publication
— The trap description needs to be included

EVALUATION D'UN NOUVEAU PIEGE EFFICACE POUR LA CAPTURE DES TABANIDES ET DES STOMOXES

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Résumé

L'importance des glossines dans la transmission des trypanosomes a longtemps masqué celle des tabanides et des stomoxes. Pourtant, ces derniers qualifiés de vecteurs mécaniques, ont sur le bétail des effets directs (lésions cutanées, spoliation sanguine, harcèlement visuel et sonore, etc.) et indirects (transmission d'agents pathogènes) qui peuvent avoir d'importantes conséquences médicales et économiques.

En Afrique de l'Ouest, la capture des ces vecteurs mécaniques reposait surtout sur l'utilisation de piéges destinés aux glossines. Seul le piège Nzi mis au point au Kenya par Mihok était considéré efficace dans la capture des tabanides et des stomoxes.

Les auteurs ont comparé les résultats de capture d'un piége dénommé « Tétra », conçu et mis au point par Marc Desquesnes (non publié) au CIRDES, par rapport au Nzi. Pendant une année, à Lahirasso au Burkina Faso, les deux piéges sont contrôles tous les deux jours et subi des rotations régulières.

Au Total, 17 991 tabanides et 2 149 stomoxes ont été collectés. Chez les tabanides, 62,7 % sont capturés par le Tétra et 37,3% par le Nzi. Pour les stomoxes, le Tétra a captué 53,9 % et le Nzi, 46,1%. Les résultats montrent que le piége Tétra est un outil efficace dans la capture des vecteurs mécaniques des trypanosomoses animales.
Un opuscule d'identification des Tabanides capturés à cette occasion est disponible sur demande au CIRDES.

Mots clés : piège Tétra, piège Nzi, vecteurs mécaniques, Tabanides, Stomoxes,

Analyse Socio-Economique de la Lutte Anti-Tsé-Tsé en Gambie: Impacts et Perceptions des Eleveurs

M. Kamuanga, J. Somda, W.F. Snow and C.I. Mugalla

La lutte contre les tsé-tsé dans le Central River Division (CRD) en Gambie est un exemple réussi de l'utilisation des pyréthrinoïdes en application épicutanée pour réduire la prévalence de la trypanosomose animale du bétail N'Dama en système de gestion villageois. Le protocole expérimental comprenait 700 bovins de 5 villages (1994-95, pâturage de 90 km^2) traités tous les 15 jours à la delthamétrine en pulvérisation, et 2300 bovins de 15 villages (1996-97, pâturage de 265 km^2) traités au pou-on, en utilisant les pulvérisateurs à dos. Les résultats expérimentaux et du suivi des exploitations ont permis d'évaluer l'impact et les bénéfices de la lutte et de comparer les deux techniques de lutte. Les paramètres de reproduction étaient estimés séparément avec les données du suivi santé-productivité des troupeaux. L'intervention a réduit la densité de *Glossina m. submorsitans de* 17% en pulvérisation et de 33% en pour-on ; le risque trypanosomien était réduit de 68% en zone d'intervention contre 11% en zone de non-intervention. L'emploi de trypanocides (80% des exploitants) n'a pas été affecté par les effets de la lutte, bien que la proportion d'utilisateurs parmi les participants ait augmenté. La croissance pondérale est de 5,2 kg/animal pour le groupe d'animaux traités. Le taux de vêlage augmente de 60,2%, ce qui dans l'ensemble indique un impact positif sur le taux de reproduction. Seule la production laitière ne confirme pas l'hypothèse d'un rendement-lait conséquent à la mise en place de la lutte. La comparaison des coûts de production et des bénéfices d'une exploitation modale de 60 têtes de bovins par budget partiel permet de conclure à un bénéfice net était de 423 $US et 364 $US respectivement pour l'utilisation de la pulvérisation et du pour-on, soit un taux marginal de rentabilité de 506% et 275%. Comparativement ceci représente un bénéfice de 10 $US et 8,70 $US par UBT. Il faut noter que l'impact de la lutte sur le bétail N'Dama reste mitigé par son caractère trypanotolérant, comparé à l'élevage de races sensibles. Les éleveurs perçoivent les avantages et inconvénients de deux méthodes de lutte, mais le plus important reste la garantie de la durabilité des bénéfices, une condition nécessaire à l'adoption de cette technologie, particulièrement en ce qui concerne l'acquisition et l'entretien des pulvérisateurs, l'accès aux insecticides et la fiabilité des services d'approvisionnement.

Socio-Economic Analysis of Tsetse Control Experiments in The Gambia: Impacts and Farmers' Perceptions

M. Kamuanga, J. Somda, W.F. Snow and C.I. Mugalla

Tsetse control with topical applications of pyrethroid insecticide to cattle in the Central River Division (CRD) of The Gambia was successful in reducing trypanosomosis in village N'Dama cattle. The experiments that included 700 cattle in 5 villages (1994-95, grazing 90 km^2) treated with deltamethrin spray twice monthly; and 2300 cattle in 15 villages (1996-97, grazing 265 km^2) treated with pour-on, were conducted with knapsack sprayers. Experiment results and follow up socio-economic surveys helped to estimate the impacts and benefits of the intervention and ascertain farmers' perceptions of the changes in productivity. Reproductive performance traits were assessed from data collected in health and productivity monitoring studies. The intervention resulted in a reduction of *Glossina m. submorsitans* numbers of 17% (spray) and 33% (pour-on); the challenge fell by 68% compared with 11% in the non-intervention area over the first period. The use of trypanocides (80% of the households) was not affected by the intervention, although the numbers of users among trial participants decreased over the 1994-97 period. Productivity estimates indicated 5.2 kg/animal in weight gain for treated animals and 60.2% increase in calving rates, implying a positive impact on reproductive performance. The trend in milk production failed to support the hypothesis of increased yield as a benefit of tsetse control. The costs of control for an average farmer raising 60 cattle were compared to benefits in a partial budget approach, pointing to an average net benefit per farmer of US$423 for spray users and US$364 in pour-on, with marginal rates of returns of 506% and 275%, respectively. This translates into benefits per TLU of about US$10 for spray and $8.70 for pour-on. The impacts of trypanosomosis on the N'Dama breeds was moderated by their tolerance of the disease and both financial and economic benefits of the intervention were less striking than in a situation with tyrpanosusceptible breeds. Farmers perceived advantages and disadvantages in using sprays and pour-on. The sustainability of the benefits remained an important aspect and a condition of technology adoption, particularly with the acquisition and maintenance of the knapsack sprayers, timely delivery of the insecticides and reliability of delivery services.

Evaluating farmers' willingness to adopt integrated packages for trypanosomiasis control in The Gambia: Application of demand revealing mechanisms

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Abstract

Economists investigating farmers' willingness to contribute (money and/or labour) to public goods supply have accumulated evidence showing that the contingent valuation (CV) technique can be applied to livestock diseases control measures. However, the trouble with the CV technique is that it may not provide good incentives for the individual to reveal his true willingness to contribute, because those goods evaluated are semi-public or public goods with market prices. Using data collected in The Gambia from livestock owners facing medium to high tsetse challenge and working closely with the International Trypanotolerance Centre, this paper applies demand-revealing mechanisms to improve the outcomes of the CV technique, and tests the factors affecting farmers' willingness to contribute labour, money or both forms of payment as well as the amount of pledged contributions. The analysis, conducted with Probit and simultaneous equations models, shows that the demand revealing mechanisms can be applied with contingent valuation techniques to improve the outcome of the latter. The results also provide a strong case for future studies to expand the range of variables used away from the broad socio-economic, and demographic factors to include farmers' perceptions of the characteristics of the disease control measures.

Key words: demand revealing mechanisms, contingent valuation, livestock, trypanosomiasis control, West Africa.

Application du mécanisme de demande revelée pour évaluer la volonté des éleveurs d'adopter des méthodes intégrées de lutte contre la trypanosomose en Gambie

Résumé

Les résultats de recherches conduites par les économistes pour évaluer la participation volontaire (main d'œuvre ou argent) des agriculteurs pour la fourniture de biens publics, a mis en évidence l'applicabilité de l'analyse contingente dans le cas des méthodes de luttes contre les maladies de bétail. Le problème avec cette technique est que les agriculteurs peuvent ne pas être suffisamment motivés pour révéler leur vraie capacité de contribution, parce que le bien considéré est soit semi-public ou public mais ayant un prix de marché. Utilisant des données collectées auprès d'éleveurs dans de zones de moyen à fort risque de tsetse, ce papier applique le mécanisme de demande révélée afin d'améliorer les résultats de l'analyse contingente. Il teste ensuite les facteurs affectant la volonté des agriculteurs de contribuer, de même que le montant de la contribution. Les données ont été analysées à l'aide de modèles Probit et d'équations simultanées. Les résultats montrent que la combinaison de l'analyse contingente avec le mécanisme de demande révélée améliore les résultats obtenus avec la première technique. Les résultats suggèrent également qu'en plus des variables socio-économiques souvent utilisées dans pareilles études, il faille prendre en compte la perception qu'ont les agriculteurs sur l'efficacité des traitements connus.

Mots clés : Mécanisme de demande révélée, évaluation contingente, bétail, contrôle de trypanosomose, Afrique de l'Ouest.

French Awarded, 4 Form

ANALYSIS OF ECONOMIC VIABILITY OF PRIVATE VETERINARY PRACTICE IN WESTERN KENYA: A PRELIMINARY REPORT

To be photocopied

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Privatization of veterinary services has been viewed as a means of easing the budgetary constraints on state in many developing nations. Cash flow statements from four private veterinarians facilitated by FITCA (K) project in the dairy meat production systems of western Kenya was monitored for a period of ten months. The private veterinarians and the animal health assistants operating in the area were also interviewed during the period. All the private veterinarians had net positive cashflows for the period. The drug purchases and consultation fees were the main cost and expense items, respectively, to the veterinarians. Lower purchasing power of the livestock owners and unfavourable policy environment hampered the operations of the practitioners. Breed improvement in cattle and chicken and involvement of the veterinarians in supplementary businesses will sustain the practice in dairy and meat production systems.

Key Words: Privatization, cashflow, dairy-meat, western Kenya

COMMUNITY PERCEPTION OF ANIMAL TRYPANOSOMIASIS IN DURBI VILLAGE, JOS EAST LOCAL GOVERNMENT AREA OF PLATEAU STATE, CENTRAL NIGERIA.

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ABSTRACT

Local perception of animal trypanosomiasis was studied in Durbi village, Jos East Local Government Area (LGA) of Plateau State, Nigeria. Focus group discussion (FGD) guide, prepared by the project team, was administered to herdowners, Unit and Sectional heads and the Director in the Agricultural Services Division Jos East Local Government Council. Our findings indicate that the common livestock kept in the area are mainly cattle, goats, sheep, turkey and chicken. These are separately reared from each other. Reasons given for keeping the animals include economic, for social activities, and for animal manure. Animal trypanosomiasis ranks highest among the perceived common diseases of livestock in the area. Signs and symptoms used in the area for diagnosis of the disease include sand eating behaviour, emaciation, anaemia, loss of appetite, liver inflamation observable at slaughter, roughness of body hairs, eye discharge and sluggish movement during grazing. Their perceived causes of the disease are drinking stream water, fly bites, tiredness due to restraining during the rainy season and farming period. Other perceived causes include too much rainfall for any year and an unknown agent that causes the disease between August and September, each year. All those interviewed reported that animal trypanosomiasis is present in their herd throughout the year. It is however, minimal in the rainy season, but has a high incidence in the dry season. The significance of these findings in the development of appropriate integrated disease control programme for the community is discussed.

Abstract of paper for presentation at the 27th Meeting of the International Scientific Council for Trypanosomiasis Research and Control (ISCTRC), organized under the auspices of the African Union (AU), Pretoria - South Africa, September 29th-3rd October, 2003.

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REPORT ON ASPECTS OF THE SOCIOECONOMIC RESEARCH ACTIVITIES IN THE NIGERIAN INSTITUTE FOR TRYPANOSOMIASIS (NITR), I. TSETSE AND ANIMAL TRYPANOSOMIASIS..

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ABSTRACT

Socio-economic and Biomedical Research Scientists in NITR are working closely together, to develop strategies and tools for integrated tsetse and trypanosomiasis control. Part of the work is currently going on in three(03) zones in the Country. These are the North East, Central and North West zones. The socio-economic research group is collecting data and information that will be useful in developing and establishing appropriate education and public enlightenment packages and strategies on the disease and its vector. These are for improving the awareness of livestock farmers and people in the endemic areas. Our studies show that there is a relatively large population of livestock in the three zones. Inspite of the large number of livestock, the people's knowledge of animal trypanosomiasis and the tsetse fly, is grossly inadequate. Only the Local Government Council (LGC) livestock officers/personnel, Fulani herdowners and herdsmen showed any knowledge of both. They reported that animal trypanosomiasis and the nuisance value of the fly, constitute major impediments to livestock production in the zones. Their treatment seeking behaviour includes reporting to the LGC animal health personnels posted to the areas. They also carry out self-medication of their animals using both orthodox and traditional remedies. The local names of the disease and vector have further been recorded in their indigenous languages. These information and data will be useful in preparing appropriate education and public enlightenment packages and strategies, against the disease and its vector.

INTRODUCTION

The Nigerian Institute for Trypanosomiasis Research (NITR), evolved from the former West African Institute for Trypanosomiasis Research (WAITR). It is the only Institute with the national mandate to conduct research into all aspects of control and surveillance on trypanosomiasis in Nigeria. Early efforts in the control of tsetse and animal trypanosomiasis yielded very positive results (Davies, 1964; Onyiah, 1977; David-West, 1987). The disease and its vector were reduced to very low levels of prevalence and infestation respectively. This was achieved through the combined efforts of Researchers in NITR and Staff of the Pest Control Services.

Unfortunately, frequent changes in Government, resulting in changes in policies and priorities, have giving rise to very weak political will and low funding to the Institute. These are considered the most important factors, which have over the years, very adversely affected control and surveillance programmes. Animal trypanosomiasis has consequently become pandemic in Nigeria (Onyiah, 1997). Despite these factors, the Institute has tried to sustain research activities within its mandate. Research on trypanosomiasis in NITR is directed towards the:-

Full text of paper presented at the 27th Meeting of the ISCTRC in Pretorial - South Africa, September 29th - 3rd October 2003.
All correspondences should be addressed to Njoku, C.I.

a) pathology, immunology and methods of treatment of the disease,
b) ecology, life cycle of the vector and the mode of transmission of the disease,
c) chemical, biological and other methods of vector control,
d) socio-economic impacts of the disease on the rural population and
e) any other matters related to the disease.

This report summarises the current socio-economic research works in some parts of the North East, Central and North West Zones of Nigeria.

GOALS OF THE SOCIOECONOMIC RESEARCH GROUP IN NITR

The activities of the Socio-economic research (SER) group in NITR are geared towards:-

i) elucidating the factors which will stimulate and encourage people in tsetse and trypanosomiasis endemic areas to participate in, and gradually take over some, if not all, aspects of control and surveillance programmes in their areas. This will be with minimum assistance from Government and/or donor Agencies,

ii) developing and establising appropriate education and public enlightenment packages and strategies, for improving the awareness of livestock farmers and people in the endemic communities. This will be part of an integrated disease control and surveillance programme against tsetse and trypanosomiasis,

iii) instituting culturally acceptable, economically feasible and locally sustainable control and surveillance programmes,

iv) developing materials that will be useful in changing positively, the perception and attitude of relevant officials of the Federal, State and Local Governments towards control and surveillance programmes,

v) collecting data and information that will be useful in convincing non-government donor organizations (NGDO) on the importance of donating or increasing their allocations of available resources for the control and surveillance on the disease.

LOCATION OF ACTIVITIES

Nigeria is currently divided into six (06) geo-political zones. These are the North East, Central, South East, South South, South West and North West zones. Our research activities on tsetse and animal trypanosomiasis so far, are located in parts of three of the zones, namely, the North East, Central and North West zones.

BRIEF SUMMARY OF RESULTS

NORTH EAST ZONE

The North East zone is made up of Yobe, Borno, Adamawa and Taraba States. The zone is estimated to have a population of 10.53 million people by the year 2003 (NARP, 1995). There are more than 60 different ethnic groups in the zone. Although some of these ethnic groups keep some livestock, the Fulanis are the major pastoralists in the zone. The others are mainly arable farmers.

The zone has about one-third of the national livestock herd. These are mainly in pastoral holdings (NARP, 1995). Total cattle population in the zone is 5,96 million heads of cattle. There

are 28.73 million goats, 6.56 million sheep, 0.62 million pigs and 0.304million camel (RIM, 1992). The zone also has a wide variety of wild animals of economic importance. Some of these are very good reservoir hosts for animal trypanosomiasis. Our SER activities in this zone are currently centred in Taraba State.

Taraba State

Taraba State has a total landmass of about 56,860km^2. Out of this land area, 19,725km^2 is used as pastoral land (JICA), 1993). The type of livestock kept in this area is related to their religious beliefs and gender. Ownership patterns in families, for livestock, show that men usually keep cattle and sheep; women own sheep, goats and pigs. Children may own goats and rabbits. The Fulanis usually do not keep pigs. Muslems forbid pigs.

Animal trypanosomiasis is considered as one of the major livestock diseases in the State. Most of the herdowners in the Local Government Area (LGA) showed a good knowledge of the disease. To avoid the disease, the nomadic pastoralists move out of the State at regular intervals in the year. They also move in search of grazing land and water. Usually, they graze their animals from July to September in the area. At the beginning of the dry season, they migrate southwards in search of pastureland. In some areas, they graze their animals on fallow land and plant residues. This is often seen after crop harvest.

Donga and Takum LGA

The work in Taraba State was carried out in two (02) LGA, namely, Donga and Takum. The two LGA are in the derived savannah region. Their total annual rainfall is between 1250-2000mm. Annual relative humidity values are between 60-80% and temperature range between 24-27°C (Onyiah, 1997).

Part of the aim of our study at this stage is to find out the people's knowledge, attitude, practices, belief (KAPB), and treatment seeking behaviour (TSB), towards the disease and the vector. To achieve this, focus group interviews were conducted with Fulani herdowners and herdsmen, male and female residents in the communities. Key informant interviews were conducted with animal health personnel, Unit and Sectional Heads. Others interviewed include Heads of Veterinary Departments, Directors of Agriculture and Natural Resources and other Administrators, in the LGC. Some of these include Chairmen, Directors of Personnel Management and Directors of Finance.

Our observations indicate that only a few groups of those interviewed in the LGA could identify the tsetse fly in terms of the colour and size. Some residents in the areas had never seen the fly before. However, the Fulani herdowners and herdsmen demonstrated a relatively good knowledge of the fly and the disease. The local names of animal trypanosomiasis and tsetse fly were also recorded. Furthermore, over the years the herdowners and herdsmen have learnt to identify the disease. When they do, they either report to the veterinary personnel in their area, or treat the animals themselves. And they use either orthodox or traditional remedies. Herdowners and herdsmen in the areas also reported that trypanosomiasis and the nuisance value of the tsetse fly constitute a major bane to their livestock production.

CENTRAL ZONE

The Central zone of Nigeria constitutes one-third of the total landmass of Nigeria. It has a land area of 281,796km^2 and spreads from longtitude 2°30' to 10°30'E and from latitude 6°30' to 11°30'N. The rainfall pattern in the zone is bimodal. It often starts between June and mid-April and lasts to mid-October. It peaks by July/August (NARP, 1994). Temperatures on the high Plateau, in the zone, are between 8-10°C (minimums) and can rise to 35°C (maximum). The lower parts of the zone experience a temperature of between 21-23°C (minimum) and a maximum of 31-40°C (Onyiah, 1997). The States within this zone are Kwara, Niger and Benue. Others include Plateau, Kogi and Abuja (the Federal Capital Teritory, FCT).

The total cattle population in the Central zone is estimated at 3,083,628 heads of cattle (NARP, 1994). This is about 22% of the national herd. The main breeds of cattle are the zebu and the West African short horn. The short horn is also called the Muturu or Keteku or N dama. The Muturus are more trypanotolerant than the Zebus (NARP, 1994). They are the traditional cattle breed of the Angas and Piapung of the Plateau. Although the other indigenous tribes keep livestock, again, the Fulanis are the major pastoralists. They herd cattle and sheep, rarely with goats except when sedentary. They carry their personal belongings on donkeys and/or castrated bulls.

Some socio-economic factors that initiate the movement of pastoralists with their animals include 1) the desire to avoid conflict with crop farmers, 2) closeness to major urban areas and/or built-up towns, 3) search for grazing land. Transhumant agro-pastoralists in the zone move relatively short distances at certain seasons of the year. This group comes back home later to harvest their crop. There are also sedentary agro-pastoralists. These migrate very short distances with their herd, especially during the dry season. They grow yams, cassava and cereals like sorghum, millet, maize, etc. Our socio-economic activities in this zone are currently going on in parts of Plateau State.

Plateau State

Plateau State is located within longitude 8° 10' to 30°E and latitude 7°10' and 40°N. Its land area is 56,245km^2 (NARP, 1994). Cattle population in Plateau State is put at 1,054,133 heads. Other livestock found in the State include goats (1,865,805); sheep (1,964,188) pigs (535,139), donkeys (28,281) horses (3,401). Dog meat is a delicacy in some parts of Plateau State. The largest dog market is in Dawaki. Dog population in the State is estimated at 286,274.

Bassa, Jos East and Bokkos LGA

Our SER work in Plateau State has been carried out in Bassa, Jos East and Bokkos LGA. These LGA are on the high Jos plateau. Over the years the belief has been that the Plateau is a tsetse and trypanosomiasis-free zone. Consequently, while some Fulani herdowners have settled there, the nomadic ones have created cattle routes through the area. The net effect of this, is a change in the epizootiology of livestock diseases, including animal trypanosomiasis on the Plateau. This is confirmed from reports from the area (Joshua and Shanthikumar 1989; Kalu, 1991; Uzoigwe et al, 1991; Kalu & Uzoigwe, 1996).

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NORTH WEST ZONE

States in the North West zone are Bauchi, Gombe, Jigawa, Kaduna, Kano, Katsina, Kebbi and Sokoto. The total landmass covered by these States is approximately 227,517km^2. The rural population especially in the northern part of the zone is made up predominantly, of Hausas and Fulanis. The southern parts are made up of about 8 ethnic groups.

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Kaduna State

Studies in Kaduna State have been carried out in Lere, Ikara, Chukun and Kaura Local Government Areas.

Lere LGA

In Lere LGA, focus group discussions were held with the herdsmen and herdowners in three administrative Districts in the LGA. Key informant interviews were also held with the Chairman of Miyyetti Allah Cattle Breeders Association, Sarki Fulani, Village and District heads.

The people identified tsetse and trypanosomiasis as the most important problem of their livestock. Those interviewed showed a good knowledge of the tsetse fly vector. They reported that the fly population and biting rate are very high in the rainy season. Consequently, the herdsmen move their livestock to Bauchi State, where the fly infestation at this time is low. In the dry season however, the people reported increased animal-fly contact, at the watering points - ie the riverine forest galleries.

The interviews also revealed that the commonest signs and symptoms usually used by them to diagnose animal trypanosomiasis are emaciation, poor hair coat, lacrimation, leather- and soil-eating behaviour. Their treatment seeking behaviour showed that they administer trypanocides (berenil) themselves. They also employ traditional remedies in their treatment (Osue et al, 2000).

Ikara and Chukun LGA

Livestock farmers in Ikara and Chukun LGA of Kaduna State demonstrated a relatively good knowledge of animal trypanosomiasis. The clinical signs and symptoms they use in recognizing the disease in their animals are almost the same as those in Lere and the other LGA mentioned earlier. However, they could not distinguish the tsetse fly from the other biting flies.

Their treatment seeking behaviour showed that they use traditional methods in the treatment of the disease. A few of them patronise veterinary clinics, where they are available. Most of the farmers interviewed, showed no knowledge of the recent technologies in the control of the disease and its vector. (Lawani et al, 1998).

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In another study in Kaura LGA of the State, an attempt was made to encourage the farmers to employ trapping technology. The newly developed NITSE trap by Research Scientists in NITR was introduced to them. They were told to purchase the traps and adopt the technology in fly control (Agbede et al, 1994). This method has been used by our Scientists to bring down tsetse populations in Agaie, Niger State (Ezebuiro et al, 1998).

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Yamaltu-Delta LGA

The work in Gombe State has so far been carried out in Yamaltu-Deba LGA. Results from the LGA showed that the people see trypanosomiasis as a very serious health problem of their livestock. They believe that the disease reaches its peak infection in animals during the rainy season. They further reported that their livestock acquire trypanosomiasis, when they are taken to Tungo and Bazara, in the neighbouring Taraba State, for grazing. The areas have suitable forest vegetation that harbours tsetse flies. The residents however, could not distinguish tsetse flies from other biting flies.

Their treatment seeking behaviour showed that they carryout self-medication of their animals. It was also observed that they treat without making any effort to find out exactly what the animals is suffering. This has resulted in great losses of their livestock.

DISCUSSION

Our studies indicate that there is a large population of livestock in the three zones studied. This is inspite of the fact that animal trypanosomiasis is wide spread in the area (Onyiah, 1997). It is therefore reasonable to state that control of tsetse and animal trypanosomiasis in the zones will enormously increase their potential for livestock production. It will also be necessary to institute adequate and sustainable surveillance programmes in the areas.

Current emphasis in the control and surveillance on tsetse and animal trypanosomiasis in Nigeria is shifting to community participation (Agbede et al, 1994; Njoku et al, 1998). For the effective implementation of any community participation programme, adequate education and public enlightenment packages and strategies for the area(s) will be very essential. Lack of appropriate packages and strategies in the past have been observed as one of the major reasons for the difficulty and/or failure in implementing effective and sustainable control and surveillance programmes in the Country (Njoku et al, 1998). To achieve this, data and information on the people's knowledge, attitude, practices, belief (KAPB) and their treatment seeking behaviour (TSB) will be invaluable.

Our results indicate that the perception of the people in the communities studied range from total lack of knowledge, to gaps in their knowledge of the disease and its vector. This is despite the fact that they consider the disease as a major hindrance to their livestock production. Furthermore, the livestock farmers in the zones employ self-medication/treatment of their livestock with both orthodox and traditional remedies. These are two practices they require to be properly informed on. Packages therefore, incorporating these and other relevant information, developed in the various indigenous languages, will be very important in any integrated control programme.

ACKNOWLEGEMENT

The Authors are very grateful to the Chairmen and Staff of the various LGC where our work is currently going on for their assistance, especially in mobilising people in their communities for the studies. We thank NITR Management for fund to carry out the work. Mr Daniel Agono kindly typed the manuscript.

REFERENCES

Agbede, R.I.S.; Maikaje, D.B.; Lawal, I.A. and Otobe, S. 1994. Tsetse and trypanosomiasis control using traps and the transfer of technology to resource poor farmers in Kaura Local Government Area of Kaduna State, Nigeria. Meeting Abstract. TTIQ Vol 22, Part 2, 1999 No.10868, pp77

Davies H. 1964, The eradication of tsetse in the Chad River system of Northern Nigeria. J. Appl. Ecol. 2, 387-403.

David-West, K.B., 1987. Integrated tsetse control: Present and future programme of national and international organisations In: Caralloro R. (Ed) PP.153-155.

Ezebuiro, O.G.C.; Abenga, J.N.; Ahmed, A.B.; Lawani, F.A.G. 1998. An observation on the prevalence of animal trypanosomiasis in Agaie integrated tsetse control pilot study area. Meeting Abstract. TTIO Vol.22, Part 2, 1999, No.10876 pp86.

JICA. 1993. Interim Report. In the Study in the National Water Resources Master Plan Vol.1, Text and Vol.2, Supporting Report FMA&RD, Abuja, Nigeria

Joshua, R.A. and Shanthikumar, S. 1989. Naturally occurring trypanosomiasis in some cattle herds around the Jos plateau of Nigeria. Bull. Anim. Hlth. Prod. Afr. 37, 95-96.

Kalu, A.U. 1991. An outbreak of trypanosomiasis on the Jos plateau, Nigeria. Trop. Anim. Hlth. Prod. 23, 215-216.

Kalu, A.U. and Uzoigwe, N.R. 1996. Tsetse and trypanosomosis on the Jos plateau: Observations on outbreaks in Barkin-Ladi Local Government Area. Trop. Vet. 14, 117-126.

Lawani, F.A.G., Thompson, G.A. and Osue H.O. 1998. Socio-economic status and awareness of animal trypanosomiasis among livestock farmers in Ikara and Chikum LGAs of Kaduna State, Nigeria. Meeting Abstract TTIO Vol.22, Part 2, 1999, No.10827.pp56.

NARP, 1994. National Agricultural Research Project, Department of Agricultural Sciences, Federal Ministry of Agriculture. Preparation of National Agricultural Research Strategy Plan. Central zone. University of Agriculture, Makurdi, Nigeria. December 1994.288pp.

NARP, 1995. National Agricultural Research Strategic Plan. Draft Report on the North East Zone. 278pp.

Njoku, C.I.; Thompson, G.A.; Sanda, S.A.U.; Zakari, M.E.; Igweh, A.C.; Osue, H.O. 1998. Community knowledge of the tsetse fly vector of trypanosomiasis in Takum Local Government Area of Taraba State, Nigeria. NITR Annual Report (in press)..

Onyiah, J.A. 1977. Fluctuation in numbers and eventual collapse of a population of G.p.palpalis in Anara Forest Reserve. NITR Annual Report, 1997.

Onyiah, J.A. 1997. Annual trypanosomosis: an overview of current status in Nigeria. Trop. Vet. 15 (3-5): 111-116.

Osue H.O.; Abenga, J.N.; Offor, I.I.; Lawani, F.A.G.; Thompson, G.A. and Njoku, C.I. 2000. Preliminary report of a diagnostic survey of cattle trypanosomosis in Lere Local Government Area of Kaduna State, Nigeria. NITR Annual, Report (in press)

RIM. 1992. Nigerian Livestock Resources, RIM Report. Vols. I-IV. Presented to the Federal Livestock Department and Pest Control, Abuja.

Uzoigwe, N.R.; Omoogun, G.A.; Njoku, C.I. and Kalejaiye, J.O. 1991. Natural trypanosome infection in goats in Vom, an indication of possible presence of tsetse on the Jos plateau. 23rd Anim. Conf. Entom. Soc. Nig. held at the University of Ibadan, Oyo State, Nigeria.

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ABSTRACT

Socio-economic Research Scientists in NITR are collecting and collating data and information for developing health education, public enlightenment and advocacy packages and strategies. This is part of efforts by the Institute towards developing appropriate tools and technologies for the integrated control and surveillance on tsetse and human African trypanosomiasis (HAT). The work so far has been carried out in the North East and North West zones of Nigeria. Our results show that the people in the Communities have little or no knowledge of HAT, especially in relation to its vector. This has consequently, adversely affected their attitude, belief and treatment seeking behaviour towards the disease. Those interviewed listed signs and symptoms of HAT as the major public health problems in the areas, instead of the disease itself. They showed a good knowledge of the social and economic risk factors for the bite of the tsetse fly. This was however, after showing them a sample of the fly. Information and data on the various ethnic/cultural and religious groups in the areas were collected. The different names of the disease and vector in the indigenous languages have also been recorded. The usefulness of these and other findings in the development of appropriate packages and strategies for health education, public enlightenment and advocacy is discussed.

Abstract of paper for presentation at the 27th Meeting of the International Scientific Council for Trypanosomiasis Research and Control (ISCTRC), organized under the auspices of the African Union (AU), Pretoria - South Africa, September 29th - 3rd October, 2003.

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RAPPORT SUR LES ASPECTS DES ACTIVITES DE RECHERCHES SOCIO-ECONOMIQUES A L'INSTITUT NIGERIAN POUR LA RECHERCHE EN TRYPANOSOMIASE (NITR), II. LES MOUCHES TSETSE ET LA TRYPANOMIASE HUMAINE AFRICAINE.

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EXTRAIT

Les scientiques, recherches en Socio-Economiques du NITR, sont en train de ressembler des donnees et des informations pour developper l'education sanitaine, la sensibiisation des masses, et la mise en place des strategies. Ceci fait partie des efforts deployes par l'Institut pour developper des outils appropries et des technologies pour un controle integre et la surveillance des mouches tsetse et de la trypanosomiase humaine africaine (HAT). Ce travail a ete mene jusqu'a present dans les zones. Nord-Est et Nord-Ouest du Nigeria. Nos resultats montrent que les gens dans ces communautes ont tres peu ou pas du tout de connaissances sur le HAT, specialement en ce qui concerne son vecteur., ceci a par consequent neativement affecte leurs attitudes, leurs croyances et leurs comportements dans le traitement de cette maladie. Ceux qui ont ete interroges ont montre des signes et des symtomes du HAT comme etant le probleme sanitaire majeur dans la region, au lieu de la maladie elle meme. Ils montrent une bonne connaissance des risques socio-economiques engendres par la piqure des mouches tsetse. Mais seule apres leur avoir montre le type de mouche en question. Des informations et de donnees sur les differents groups ethniques, culturels et religieux de la regions ont ete rassemblees. Les differents noms de la maladies et de son verteur en langues locales ont ete enregistres. L'utilite de ces recherches et d'autres enquetes pour le developpement de mesures appropriees, pour l'education sanitaire, pour la sensibilisation des masses et pour un plaidoyes ont ete discutes.

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ABSTRACT

Socio-economic and Biomedical Research Scientists in NITR are working closely together, to develop strategies and tools for integrated tsetse and trypanosomiasis control. Part of the work is currently going on in three(03) zones in the Country. These are the North East, Central and North West zones. The socio-economic research group is collecting data and information that will be useful in developing and establishing appropriate education and public enlightenment packages and strategies on the disease and its vector. These are for improving the awareness of livestock farmers and people in the endemic areas. Our studies show that there is a relatively large population of livestock in the three zones. Inspite of the large number of livestock, the people's knowledge of animal trypanosomiasis and the tsetse fly, is grossly inadequate. Only the Local Government Council (LGC) livestock officers/personnel, Fulani herdowners and herdsmen showed any knowledge of both. They reported that animal trypanosomiasis and the nuisance value of the fly, constitute major impediments to livestock production in the zones. Their treatment seeking behaviour includes reporting to the LGC animal health personnels posted to the areas. They also carry out self-medication of their animals using both orthodox and traditional remedies. The local names of the disease and vector have further been recorded in their indigenous languages. These information and data will be useful in preparing appropriate education and public enlightenment packages and strategies, against the disease and its vector.

INTRODUCTION

The Nigerian Institute for Trypanosomiasis Research (NITR), evolved from the former West African Institute for Trypanosomiasis Research (WAITR). It is the only Institute with the national mandate to conduct research into all aspects of control and surveillance on trypanosomiasis in Nigeria. Early efforts in the control of tsetse and animal trypanosomiasis yielded very positive results (Davies, 1964; Onyiah, 1977; David-West, 1987). The disease and its vector were reduced to very low levels of prevalence and infestation respectively. This was achieved through the combined efforts of Researchers in NITR and Staff of the Pest Control Services.

Unfortunately, frequent changes in Government, resulting in changes in policies and priorities, have giving rise to very weak political will and low funding to the Institute. These are considered the most important factors, which have over the years, very adversely affected control and surveillance programmes. Animal trypanosomiasis has consequently become pandemic in Nigeria (Onyiah, 1997). Despite these factors, the Institute has tried to sustain research activities within its mandate. Research on trypanosomiasis in NITR is directed towards the:-

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a) pathology, immunology and methods of treatment of the disease,
b) ecology, life cycle of the vector and the mode of transmission of the disease,
c) chemical, biological and other methods of vector control,
d) socio-economic impacts of the disease on the rural population and
e) any other matters related to the disease.

This report summarises the current socio-economic research works in some parts of the North East, Central and North West Zones of Nigeria.

GOALS OF THE SOCIOECONOMIC RESEARCH GROUP IN NITR

The activities of the Socio-economic research (SER) group in NITR are geared towards:-

i) elucidating the factors which will stimulate and encourage people in tsetse and trypanosomiasis endemic areas to participate in, and gradually take over some, if not all, aspects of control and surveillance programmes in their areas. This will be with minimum assistance from Government and/or donor Agencies,

ii) developing and establising appropriate education and public enlightenment packages and strategies, for improving the awareness of livestock farmers and people in the endemic communities. This will be part of an integrated disease control and surveillance programme against tsetse and trypanosomiasis,

iii) instituting culturally acceptable, economically feasible and locally sustainable control and surveillance programmes,

iv) developing materials that will be useful in changing positively, the perception and attitude of relevant officials of the Federal, State and Local Governments towards control and surveillance programmes,

v) collecting data and information that will be useful in convincing non-government donor organizations (NGDO) on the importance of donating or increasing their allocations of available resources for the control and surveillance on the disease.

LOCATION OF ACTIVITIES

Nigeria is currently divided into six (06) geo-political zones. These are the North East, Central, South East, South South, South West and North West zones. Our research activities on tsetse and animal trypanosomiasis so far, are located in parts of three of the zones, namely, the North East, Central and North West zones.

BRIEF SUMMARY OF RESULTS

NORTH EAST ZONE

The North East zone is made up of Yobe, Borno, Adamawa and Taraba States. The zone is estimated to have a population of 10.53 million people by the year 2003 (NARP, 1995). There are more than 60 different ethnic groups in the zone. Although some of these ethnic groups keep some livestock, the Fulanis are the major pastoralists in the zone. The others are mainly arable farmers.

The zone has about one-third of the national livestock herd. These are mainly in pastoral holdings (NARP, 1995). Total cattle population in the zone is 5,96 million heads of cattle. There are 28.73 million goats, 6.56 million sheep, 0.62 million pigs and 0.304million camel (RIM, 1992). The zone also has a wide variety of wild animals of economic importance. Some of these are very good reservoir hosts for animal trypanosomiasis. Our SER activities in this zone are currently centred in Taraba State.

Taraba State

Taraba State has a total landmass of about 56,860km^2. Out of this land area, 19,725km^2 is used as pastoral land (JICA), 1993). The type of livestock kept in this area is related to their religious beliefs and gender. Ownership patterns in families, for livestock, show that men usually keep cattle and sheep; women own sheep, goats and pigs. Children may own goats and rabbits. The Fulanis usually do not keep pigs. Muslems forbid pigs.

Animal trypanosomiasis is considered as one of the major livestock diseases in the State. Most of the herdowners in the Local Government Area (LGA) showed a good knowledge of the disease. To avoid the disease, the nomadic pastoralists move out of the State at regular intervals in the year. They also move in search of grazing land and water. Usually, they graze their animals from July to September in the area. At the beginning of the dry season, they migrate southwards in search of pastureland. In some areas, they graze their animals on fallow land and plant residues. This is often seen after crop harvest.

Donga and Takum LGA

The work in Taraba State was carried out in two (02) LGA, namely, Donga and Takum. The two LGA are in the derived savannah region. Their total annual rainfall is between 1250-2000mm. Annual relative humidity values are between 60-80% and temperature range between 24-27°C (Onyiah, 1997).

Part of the aim of our study at this stage is to find out the people's knowledge, attitude, practices, belief (KAPB), and treatment seeking behaviour (TSB), towards the disease and the vector. To achieve this, focus group interviews were conducted with Fulani herdowners and herdsmen, male and female residents in the communities. Key informant interviews were conducted with animal health personnel, Unit and Sectional Heads. Others interviewed include Heads of Veterinary Departments, Directors of Agriculture and Natural Resources and other Administrators, in the LGC. Some of these include Chairmen, Directors of Personnel Management and Directors of Finance.

Our observations indicate that only a few groups of those interviewed in the LGA could identify the tsetse fly in terms of the colour and size. Some residents in the areas had never seen the fly before. However, the Fulani herdowners and herdsmen demonstrated a relatively good knowledge of the fly and the disease. The local names of animal trypanosomiasis and tsetse fly were also recorded. Furthermore, over the years the herdowners and herdsmen have learnt to identify the disease. When they do, they either report to the veterinary personnel in their area, or treat the animals themselves. And they use either orthodox or traditional remedies. Herdowners and herdsmen in the areas also reported that trypanosomiasis and the nuisance value of the tsetse fly constitute a major bane to their livestock production.

CENTRAL ZONE

The Central zone of Nigeria constitutes one-third of the total landmass of Nigeria. It has a land area of 281,796km^2 and spreads from longtitude 2°30' to 10°30'E and from latitude 6°30' to 11°30'N. The rainfall pattern in the zone is bimodal. It often starts between June and mid-April and lasts to mid-October. It peaks by July/August (NARP, 1994). Temperatures on the high Plateau, in the zone, are between 8-10°C (minimums) and can rise to 35°C (maximum). The lower parts of the zone experience a temperature of between 21-23°C (minimum) and a maximum of 31-40°C (Onyiah, 1997). The States within this zone are Kwara, Niger and Benue.

Others include Plateau, Kogi and Abuja (the Federal Capital Teritory, FCT).

The total cattle population in the Central zone is estimated at 3,083,628 heads of cattle (NARP, 1994). This is about 22% of the national herd. The main breeds of cattle are the zebu and the West African short horn. The short horn is also called the Muturu or Keteku or N dama. The Muturus are more trypanotolerant than the Zebus (NARP, 1994). They are the traditional cattle breed of the Angas and Piapung of the Plateau. Although the other indigenous tribes keep livestock, again, the Fulanis are the major pastoralists. They herd cattle and sheep, rarely with goats except when sedentary. They carry their personal belongings on donkeys and/or castrated bulls.

Some socio-economic factors that initiate the movement of pastoralists with their animals include 1) the desire to avoid conflict with crop farmers, 2) closeness to major urban areas and/or built-up towns, 3) search for grazing land. Transhumant agro-pastoralists in the zone move relatively short distances at certain seasons of the year. This group comes back home later to harvest their crop. There are also sedentary agro-pastoralists. These migrate very short distances with their herd, especially during the dry season. They grow yams, cassava and cereals like sorghum, millet, maize, etc. Our socio-economic activities in this zone are currently going on in parts of Plateau State.

Plateau State

Plateau State is located within longitude 8° 10' to 30°E and latitude 7°10' and 40°N. Its land area is 56,245km^2 (NARP, 1994). Cattle population in Plateau State is put at 1,054,133 heads. Other livestock found in the State include goats (1,865,805); sheep (1,964,188) pigs (535,139), donkeys (28,281) horses (3,401). Dog meat is a delicacy in some parts of Plateau State. The largest dog market is in Dawaki. Dog population in the State is estimated at 286,274.

Bassa, Jos East and Bokkos LGA

Our SER work in Plateau State has been carried out in Bassa, Jos East and Bokkos LGA. These LGA are on the high Jos plateau. Over the years the belief has been that the Plateau is a tsetse and trypanosomiasis-free zone. Consequently, while some Fulani herdowners have settled there, the nomadic ones have created cattle routes through the area. The net effect of this, is a change in the epizootiology of livestock diseases, including animal trypanosomiasis on the Plateau. This is confirmed from reports from the area (Joshua and Shanthikumar 1989; Kalu, 1991; Uzoigwe et al, 1991; Kalu & Uzoigwe, 1996).

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The work in Gombe State has so far been carried out in Yamaltu-Deba LGA. Results from the LGA showed that the people see trypanosomiasis as a very serious health problem of their livestock. They believe that the disease reaches its peak infection in animals during the rainy season. They further reported that their livestock acquire trypanosomiasis, when they are taken to Tungo and Bazara, in the neighbouring Taraba State, for grazing. The areas have suitable forest vegetation that harbours tsetse flies. The residents however, could not distinguish tsetse flies from other biting flies.

Their treatment seeking behaviour showed that they carryout self-medication of their animals. It was also observed that they treat without making any effort to find out exactly what the animals is suffering. This has resulted in great losses of their livestock.

DISCUSSION

Our studies indicate that there is a large population of livestock in the three zones studied. This is inspite of the fact that animal trypanosomiasis is wide spread in the area (Onyiah, 1997). It is therefore reasonable to state that control of tsetse and animal trypanosomiasis in the zones will enormously increase their potential for livestock production. It will also be necessary to institute adequate and sustainable surveillance programmes in the areas.

Current emphasis in the control and surveillance on tsetse and animal trypanosomiasis in Nigeria is shifting to community participation (Agbede et al, 1994; Njoku et al, 1998). For the effective implementation of any community participation programme, adequate education and public enlightenment packages and strategies for the area(s) will be very essential. Lack of appropriate packages and strategies in the past have been observed as one of the major reasons for the difficulty and/or failure in implementing effective and sustainable control and surveillance programmes in the Country (Njoku et al, 1998). To achieve this, data and information on the people's knowledge, attitude, practices, belief (KAPB) and their treatment seeking behaviour (TSB) will be invaluable.

Our results indicate that the perception of the people in the communities studied range from total lack of knowledge, to gaps in their knowledge of the disease and its vector. This is despite the fact that they consider the disease as a major hindrance to their livestock production. Furthermore, the livestock farmers in the zones employ self-medication/treatment of their livestock with both orthodox and traditional remedies. These are two practices they require to be properly informed on. Packages therefore, incorporating these and other relevant information, developed in the various indigenous languages, will be very important in any integrated control programme.

ACKNOWLEGEMENT

The Authors are very grateful to the Chairmen and Staff of the various LGC where our work is currently going on for their assistance, especially in mobilising people in their communities for the studies. We thank NITR Management for fund to carry out the work. Mr Daniel Agono kindly typed the manuscript.

REFERENCES

Agbede, R.I.S.; Maikaje, D.B.; Lawal, I.A. and Otobe, S. 1994. Tsetse and trypanosomiasis control using traps and the transfer of technology to resource poor farmers in Kaura Local Government Area of Kaduna State, Nigeria. Meeting Abstract. TTIQ Vol 22, Part 2, 1999 No.10868, pp77

Davies H. 1964, The eradication of tsetse in the Chad River system of Northern Nigeria. J. Appl. Ecol. 2, 387-403.

David-West, K.B., 1987. Integrated tsetse control: Present and future programme of national and international organisations In: Caralloro R. (Ed) PP.153-155.

Ezebuiro, O.G.C.; Abenga, J.N.; Ahmed, A.B.; Lawani, F.A.G. 1998. An observation on the prevalence of animal trypanosomiasis in Agaie integrated tsetse control pilot study area. Meeting Abstract. TTIO Vol.22, Part 2, 1999, No.10876 pp86.

JICA. 1993. Interim Report. In the Study in the National Water Resources Master Plan Vol.1, Text and Vol.2, Supporting Report FMA&RD, Abuja, Nigeria

Joshua, R.A. and Shanthikumar, S. 1989. Naturally occurring trypanosomiasis in some cattle herds around the Jos plateau of Nigeria. Bull. Anim. Hlth. Prod. Afr. 37, 95-96.

Kalu, A.U. 1991. An outbreak of trypanosomiasis on the Jos plateau, Nigeria. Trop. Anim. Hlth. Prod. 23, 215-216.

Kalu, A.U. and Uzoigwe, N.R. 1996. Tsetse and trypanosomosis on the Jos plateau: Observations on outbreaks in Barkin-Ladi Local Government Area. Trop. Vet. 14, 117-126.

Lawani, F.A.G., Thompson, G.A. and Osue H.O. 1998. Socio-economic status and awareness of animal trypanosomiasis among livestock farmers in Ikara and Chikum LGAs of Kaduna State, Nigeria. Meeting Abstract TTIO Vol.22, Part 2, 1999, No.10827.pp56.

NARP, 1994. National Agricultural Research Project, Department of Agricultural Sciences, Federal Ministry of Agriculture. Preparation of National Agricultural Research Strategy Plan. Central zone. University of Agriculture, Makurdi, Nigeria. December 1994.288pp.

NARP, 1995. National Agricultural Research Strategic Plan. Draft Report on the North East Zone. 278pp.

Njoku, C.I.; Thompson, G.A.; Sanda, S.A.U.; Zakari, M.E.; Igweh, A.C.; Osue, H.O. 1998. Community knowledge of the tsetse fly vector of trypanosomiasis in Takum Local Government Area of Taraba State, Nigeria. NITR Annual Report (in press)..

Onyiah, J.A. 1977. Fluctuation in numbers and eventual collapse of a population of G.p.palpalis in Anara Forest Reserve. NITR Annual Report, 1997.

Onyiah, J.A. 1997. Annual trypanosomosis: an overview of current status in Nigeria. Trop. Vet. 15 (3-5): 111-116.

Osue H.O.; Abenga, J.N.; Offor, I.I.; Lawani, F.A.G.; Thompson, G.A. and Njoku, C.I. 2000. Preliminary report of a diagnostic survey of cattle trypanosomosis in Lere Local Government Area of Kaduna State, Nigeria. NITR Annual, Report (in press)

RIM. 1992. Nigerian Livestock Resources, RIM Report. Vols. I-IV. Presented to the Federal Livestock Department and Pest Control, Abuja.

Uzoigwe, N.R.; Omoogun, G.A.; Njoku, C.I. and Kalejaiye, J.O. 1991. Natural trypanosome infection in goats in Vom, an indication of possible presence of tsetse on the Jos plateau. 23rd Anim. Conf. Entom. Soc. Nig. held at the University of Ibadan, Oyo State, Nigeria.

COMMUNITY KNOWLEDGE, ATTITUDE AND AVAILABLE HEALTH CARE SERVICES FOR HUMAN AFRICAN TRYPANOSOMIASIS IN DURBI VILLAGE, JOS EAST LOCAL GOVERNMENT AREA, PLATEAU STATE, CENTRAL NIGERIA.

Njoku, C.I.; Dadah, A.J., *Onyekwelu, N.A.; *Iliyasu, B.; *Bashir, Y.A.; Dede, P.M. and **Ajagbonna, V.N.

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ABSTRACT

Between October 2001 and February 2002, there were reports from members of the community in Jos East Local Government Area (LGA) on the nuisance value of large biting flies in the area. Consequently, both biomedical and socio-economic Research Scientists from the Nigerian Institute for Trypanosomiasis Research (NITR) went in to investigate the problem. Focus group interviews were conducted with the adult male and female residents, primary health care (PHC) Unit and Sectional heads and the PHC Co-ordinator and Supervisory Councillor for health. The results show that the male and female residents and the Supervisory Councillor for health did not know the relationship between the tsetse fly found in the area and sleeping sickness human African (trypanosomiasis). The residents however, reported that a few members of the community have "ciwon barci" which is the Hausa name for sleeping sickness. They were ready to take members of the research team to the homes of the patients. Signs and symptoms they use in identifying the disease include sleeping at odd periods of the day, at village square meetings and while cooking, eating or carrying out other house chores. Their perceived causes of the diseases include spiritual or enemy attacks, poison and birth abnormalities which develop later in life. They see the disease as a major source of worry. The patients are treated using both orthodox and traditional methods. When these fail, they give up. PHC staff interviewed, however, reported that they have neither noticed any cases nor received any reports of the disease in the area. This report contains the people's perception of the accessibility, affordability, satisfaction and recommendations on ways of improving the available PHC services. The significance of these findings and the need for adequate public enlightenment, diagnostic, treatment and surveillance programme in this and other potential sleeping sickness endemic areas in Nigeria is discussed.

Abstract of paper for presentation at the 27th Meeting of the International Scientific Council for Trypanosomiasis Research and Control (ISCTRC), organized under the auspices of the African Union (AU), Pretoria - South Africa, September 29th-3rd October, 2003.

All correspondences should be addressed to Njoku, C.I.

Epidemiological Findings on *T. evansi*

As a non-tsetse transmitted trypanosomes *T. evansi* in Sudan is almost exclusively confined to camel herds. However serum samples had been collected and examined from goats and sheep in the same zone. Although no parasitological positives were detected among these species but sero-positives using svratex were present. Indications that sheep and goats can act as reservoir are discussed.

Socio-economic effect of trypanosomiasis on pasturalist communities

A RRA was conducted in various cattle pastural groups in the Sudan, it was clear that they recognized trypanosomiasis as a serious disease which excerts a a continuous movement to avoid its vectors. The disease was ranked second to ticks and tick-borne diseases. Losses due to lowered animal production and use of trypanociadal preparations was estimated to be very high. Proposed control measures are necessary to stop the spread of *Trypanosoma* species to areas where it had not been endemic.

SOCIO-ECONOMIC IMPACT OF TRYPANOSOMIASIS CONTROL IN ANGOLA

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Sleeping sickness in knowen in Angola since 1871 at 100 km in the southern region around Luanda.
Actually six northen Angolan provinces are affected by this disease and are among the rich regions of the country.
In past, Portugal had a strong and rich colonial country with the coffee production, wood exploration and others cultivations.
To protect the native workers in those plantations, the colonial powerful created the "Missão de Combate às Tripanossomíases-MCT" a specialized service to control trypanosomiasis. Angolan reached a good ranking in African countries development.
The civilian war after national independence favoured the human african trypanosomiasis to re-emerge and to be a big obstacle for country development in socio-economic aspects.
Since 2000, Angolan Government decide to create a similar structure of MCT now designed "Instituto de Combate e Controlo das Tripanossomíases – ICCT" in charge to plan and execute the national policy about sleeping sickness control.
Now with the end of the civilian war, ICCT has a capacity to access to the endemic region where live about four millions persons at risk to be affected by the disease.
National strategy and norms exist.
The government allocate resources to ICCT.
International and national Partners are helping us. So we hope to contribute to the global country development and against poverty.

IMPACT SOCIO-ECONOMIQUE DE LA LUTTE CONTRE LA TRYPANOSOMOSE EN ANGOLA

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En Angola, la maladie du sommeil est connue depuis 1871 à 100 Km au sud de Luanda. Les provinces où sévit ce fléau se situent au nord du pays et sont parmi les plus riches du pays. Avec la production du café, d'autres cultures et l'exploitation du bois qui constituent une partie des richesses de ces régions, le Portugal réussit à construire une colonie puissante et enviée. Ayant compris la nécessité de préserver la main d'œuvre autochtone qui était menacée par ce fléau, il créa la « missão de combate as tripanossomíases-MCT », un service de santé spécialisé et autonome qui a permis le contrôle de la maladie du sommeil. Ainsi, l'Angola se plaça dans le concert des pays africains riches.

Après l'avènement de l'indépendance nationale en 1975, le pays sombra dans la guerre civile. La maladie du sommeil, jadis contrôlée, reémergea et redevint un frein au développement du pays.

Depuis l'année 2000, le Gouvernement angolais a créé « l'Instituto de combate e controlo das tripanossomíases-ICCT », une institution spécialisée à l'image de l'ancien MCT.

La population à risque représente le tiers de la population totale du pays. Ce qui représente un obstacle au développement socio-économique du pays qui vient de sortir définitivement de la guerre. Actuellement, le pays est entièrement accessible. Une stratégie nationale de lutte existe. Tous les espoirs sont donc permis pour, une nouvelle fois, généraliser la lutte et atteindre l'état de contrôle de la maladie permettant, comme autrefois, à la région nord de jouer pleinement son rôle moteur dans le développement du pays et contribuer à la lutte contre la pauvreté.

A socio-economic appraisal of current practices, constraints and opportunities of livestock health, production and utilization in the tsetse-infested Transmara district, Kenya

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Abstract (ISCTRC 2003)

Transmara is a tsetse-infested district, whose human inhabitants are mainly pastoral. It is one of the high potential arid and semi-arid districts in Kenya. Some of the highest and most diverse wildlife populations in Kenya are found in this district. Under the setting of livestock-wildlife interface, a study was initiated to investigate factors affecting the improvement of livestock productivity, health and utilisation in Sitoka sub-location of Kirindon division, Transmara disrict. With the expectation that livestock improvement is to be achieved through increased awareness and understanding of sustainable animal health management, a socio-economic appraisal was carried out in the Sitoka sublocation on practices, constraints and opportunities influencing production and utilization of livestock. The study was undertaken by use of formal surveys in which 43 *bomas* participated. A pre-tested structured questionnaire was the major appraisal instrument used. The most practiced production enterprises were livestock rearing (100%), bee keeping (67%) and crop farming (30%). The major livestock types kept included cattle, sheep, goats, donkeys and poultry, reared by 100, 95, 91, 56 and 30% of the selected *bomas*. Apart from marketing problems, 98% of the respondents concurred that both livestock diseases and wildlife menace, and lack of pastures (70%), were the three most serious production constraints commonly experienced in Sitoka. Ticks, tsetse flies and tabanids were identified as the most important livestock disease vectors by 100, 98 and 88% of the respondents respectively, while both East Coast Fever and trypanosomosis (100%), and helminthosis (84%) were identified as the most important livestock diseases. Majority of the respondents (98 and 63%) obtain their incomes through selling of livestock and honey. The most marketed farm products in the study area are cattle (100%), sheep (74%), goats (72%), and honey (58%). Although new opportunities such as bee-keeping and crop (maize) cultivation are coming up, the results of this study indicate that the inhabitants of Sitoka sublocation in Transmara district are predominantly pastoralists, whose livelihoods are still dependent on livestock. Livestock disease vectors (ticks and tsetse flies), livestock diseases (ECF, trypanosomosis and helminthosis) and wildlife menace are abound. It therefore appears that in order to improve health, production, and exploitation of the livestock enterprises in the study area, it would be necessary for the livestock diseases, wildlife menace, pasture scarcity and marketing constraints to be addressed.

COMMUNITY PERCEPTION OF ANIMAL TRYPANOSOMIASIS IN DURBI VILLAGE, JOS EAST LOCAL GOVERNMENT AREA OF PLATEAU STATE, CENTRAL NIGERIA.

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1.Veterinary and Livestock Studies Division, NITR, PMB 03, Vom, Plateau State, Nigeria.

2.Biochemistry and Chemotherapy Division, NITR, PMB 03, Vom, Plateau State, Nigeria.

ABSTRACT

Local perception of animal trypanosomiasis was studied in Durbi village, Jos East Local Government Area (LGA) of Plateau State, Nigeria. Focus group discussion (FGD) guide, prepared by the project team, was administered to herdowners, Unit and Sectional heads and the Director in the Agricultural Services Division Jos East Local Government Council. Our findings indicate that the common livestock kept in the area are mainly cattle, goats, sheep, turkey and chicken. These are separately reared from each other. Reasons given for keeping the animals include economic, for social activities, and for animal manure. Animal trypanosomiasis ranks highest among the perceived common diseases of livestock in the area. Signs and symptoms used in the area for diagnosis of the disease include sand eating behaviour, emaciation, anaemia, loss of appetite, liver inflamation observable at slaughter, roughness of body hairs, eye discharge and sluggish movement during grazing. Their perceived causes of the disease are drinking stream water, fly bites, tiredness due to restraining during the rainy season and farming period. Other perceived causes include too much rainfall for any year and an unknown agent that causes the disease between August and September, each year. All those interviewed reported that animal trypanosomiasis is present in their herd throughout the year. It is however, minimal in the rainy season, but has a high incidence in the dry season. The significance of these findings in the development of appropriate integrated disease control programme for the community is discussed.

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All correspondences should be addressed to Njoku, C.I.

COMMUNITY KNOWLEDGE, ATTITUDE AND AVAILABLE HEALTH CARE SERVICES FOR HUMAN AFRICAN TRYPANOSOMIASIS IN DURBI VILLAGE, JOS EAST LOCAL GOVERNMENT AREA, PLATEAU STATE, CENTRAL NIGERIA.

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***Biochemistry and Chemotherapy Division, NITR, PMB 03, Vom, Plateau State, Nigeria.**

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ABSTRACT

Between October 2001 and February 2002, there were reports from members of the community in Jos East Local Government Area (LGA) on the nuisance value of large biting flies in the area. Consequently, both biomedical and socio-economic Research Scientists from the Nigerian Institute for Trypanosomiasis Research (NITR) went in to investigate the problem. Focus group interviews were conducted with the adult male and female residents, primary health care (PHC) Unit and Sectional heads and the PHC Co-ordinator and Supervisory Councillor for health. The results show that the male and female residents and the Supervisory Councillor for health did not know the relationship between the tsetse fly found in the area and sleeping sickness human African (trypanosomiasis). The residents however, reported that a few members of the community have "ciwon barci" which is the Hausa name for sleeping sickness. They were ready to take members of the research team to the homes of the patients. Signs and symptoms they use in identifying the disease include sleeping at odd periods of the day, at village square meetings and while cooking, eating or carrying out other house chores. Their perceived causes of the diseases include spiritual or enemy attacks, poison and birth abnormalities which develop later in life. They see the disease as a major source of worry. The patients are treated using both orthodox and traditional methods. When these fail, they give up. PHC staff interviewed, however, reported that they have neither noticed any cases nor received any reports of the disease in the area. This report contains the people's perception of the accessibility, affordability, satisfaction and recommendations on ways of improving the available PHC services. The significance of these findings and the need for adequate public enlightenment, diagnostic, treatment and surveillance programme in this and other potential sleeping sickness endemic areas in Nigeria is discussed.

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All correspondences should be addressed to Njoku, C.I.

Reflections on Environmental Change and Sustainable Agriculture in Areas of Autonomous Trypanosomosis Control

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Summary

Serious environmental degradation, caused at least in part by agricultural activities, continues apace thoughout Africa.

Many countries appear unable, or unwilling, to integrate environmental considerations into their agricultural and rural development policies.

One reason for this is that the international debate on sustainable agriculture has concentrated on environmental issues, with which many ministries of agriculture are not fully engaged.

Agriculture is often presented as a significant part of the problem, with little regard for good agricultural practices that are part of the solution.

This paper highlights the main drivers of environmental change in tsetse-controlled areas of Africa and identifies key factors in the promotion of sustainable agriculture.

Résumé

L'environnement est gravement dégradé dans de nombreuses régions d'Afrique, en partie à cause des activités agricoles.

Beaucoup de pays n'ont pas les moyens ou la volonté d'intégrer les impératifs écologiques dans leurs politiques de développement agricole et rural.

Cela s'explique notamment du fait que les débats relatifs à l'agriculture durable à l'échelle internationale mettent l'accent sur les problèmes écologiques, sans véritable participation des ministères de l'agriculture.

L'agriculture est généralement considérée comme largement responsable du problème, sans tenir compte du fait que de bonnes pratiques agricoles figurent aussi parmi les solutions.

Cette communication mettre on lumière les conducteurs principaux de changement environnemental en Afrique et identifie les facteurs principaux dans la promotion de l'agriculture durable.

Abstract for the 27th ISCTRC meeting, Pretoria, South Africa, 2003

Poster presentation

Abstract

Environmental and genetic effects on growth of N'Dama cattle raised under tsetse challenge

N.A. Bosso[1,2], E.H. van der Waaij[3], K. Agyemang[1] and J.A.M. van Arendonk[2]. [1]International Trypanotolerance Centre, PMB 14 Banjul, The Gambia, [2]Wageningen Institute of Animal Sciences, 6700 AH Wageningen, The Netherlands, [3]Department of Farm Animal Health, Veterinary Faculty, University of Utrecht, Yalelaan 5, Utrecht, The Netherlands.*

Data on body weight of N'Dama cattle, kept under tsetse challenge, at the ITC's research stations Keneba and Bansang on 707 to 1099 animals (variation in number between across ages) were used in this study. Animals are born and weaned in a low tsetse challenge area (low trypanosomosis challenge), thereafter moved to a high tsetse challenge area. Body weight recorded at birth and after weaning at three months intervals was considered in the analysis. Season was divided in rainy (WET), early dry (EDR) and late dry (LDR). Calving occurred all year round, though with peaks in WET and EDR. Heritabilities (h^2) phenotypic (r_p) and genetic (r_g) correlations for growth traits were estimated using an animal model. h^2 ranged from 0.11 for weight at 24 months (W24) to 0.4 for weight at 36 months (W36) and from 0.13 for weight during LDR to 0.27 for weight during EDR. r_g between birth weight (BW) and weight at 12 (W12), and 15 (W15) months were moderately high (0.51 and 0.6, respectively). r_g between most weights and weight gains during seasons ranged from -0.02 for WET and BW to 0.83 for W36 and LDR. The results indicated that growths during the three seasons are different traits. Additive genetic variance exists for the growth traits considered, which, therefore, may be included in the ongoing breeding programme. The genetic trend were highest for W36 (0.88 kg/year) and for weight gain in the EDR (0.35 kg/year).

Résumé

Effets du milieu et génétiques sur la croissance de la race N'Dama élevée en zones d'infestation de glossines

N.A. Bosso[1,2], E.H. van der Waaij[3], K. Agyemang[1] and J.A.M. van Arendonk[2]. [1]International Trypanotolerance Centre, PMB 14 Banjul, The Gambia, [2]Wageningen Institute of Animal Sciences, 6700 AH Wageningen, The Netherlands, [3]Department of Farm Animal Health, Veterinary Faculty, University of Utrecht, Yalelaan 5, Utrecht, The Netherlands.*

Les données sur les caractères de croissance de 707 à 1099 animaux de race N'Dama, élevée en zones d'infestation de glossines, ont été étudiés dans les stations de recherche de l'ITC à Keneba et Bansang. Les animaux naissent et sont sevrés en zone à faible infestation, ensuite déplacés vers une zone à infestation élevée. Les poids ont été

enregistrés à la naissance, et après sevrage à trois mois d'intervalles. L'année a été divisée en saison pluvieuse (WW), sèche précose (EDR) et sèche tardive (LDR). L'héritabilité, les corrélations phénotypiques et génétiques ont été estimés en utilisant un modèle animal. Les estimations d'héritabilité varient de 0,11 pour le poids à 24 mois (W24) à 0,4 pour le poids à 36 mois (W36) et de 0,13 pour le poids durant LDR à 0,27 pour le poids durant EDR. Les corrélations génétiques entre poids à la naissance (BW), à 12 (W12) et 15 mois (W15) sont modérément élevés (0,51 et 0,6, respectivement). Celles, entre les poids et gains de poids durant les saisons varient de -0,02 pour WW et BW à 0,83 pour W36 et LDR. Les résultats indiquent que les croissances durant les saisons représentent différents caractères. Les variances génétiques additives existent pour les caractères considérés, et peuvent être inclus dans le programme de selection en cours. Le gain génétique est les plus élevé pour W36 (0,88 kg/year) et pour le gain de poids durant EDR (0,35 kg/year).

APPLICATION OF GEOGRAPHICAL INFORMATION SYSTEMS IN STUDYING THE EPIDEMIOLOGY OF SLEEPING SICKNESS IN KENYA

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Abstract

In Kenya, sleeping sickness caused by *Trypanosoma brucei rhodesiense* is confined to the Nyanza and Western provinces tsetse belts. The disease is thought to have spread from southeast Uganda, crossing the Sio river into Samia location. Approximately 979,000 people are considered at risk from currently active foci in four districts. The objective of this study was to geo-reference all past and present sleeping sickness villages and assess factors that increase predisposition of individuals to infection. Geographical coordinates of the villages were collected using a Global Positioning System (GPS). Retrospective data analysis and mapping was done using MapInfo Geographical Information System (GIS) software, and thematic maps generated to illustrate the epidemiological status. Mapping of epidemiological spatial data of sleeping sickness linked to the villages, land use, natural resources, human and cattle population was also undertaken. There are 121 villages recorded in the sleeping sickness database. However, only 114 past and current sleeping sickness villages were identified and geo-referenced. The results of this analysis show that there have been changes in the spatial distribution of sleeping sickness foci in Kenya, and especially to the north of lake Victoria affecting northern Busia, Teso, Bungoma, and Mumias/Butere districts. Spatial epidemiological data showed that sleeping sickness was highest in areas with low human population density, ranging from 0-340/km^2 and high livestock population, ranging from 5,000 to 10,000 cattle. The areas with high livestock populations had low human population densities due to availability of grazing fields. The results showed that livestock could act as reservoirs of the parasite and as hosts for sustaining the tsetse fly. Low human population could result in land not being fully utilized leading to bush encroachment, thus increasing tsetse densities, and hence increase human-tsetse fly interactions. This study will aid in assessment of disease risk and improvement of strategies for control of tsetse and trypanosomosis.

1 Cooling Rapid — Solomon

2 Protocol-Cross / Interop — ICE-RI (Nuria)

3 Extension — Bauer

4 Human-Types → ICE-RI Berg / Randall

5 Anonymity types ↗

6 Vector Control — Francis

7 Socioeconomics — Harald / Marlene

8 Basket ← Gisele ↗

⊛ Rank papers from 1 ... in each category (Give reasons)
I repeated say why!!

Category

1 - Oral
2 - Poster
3 - Disputed (repetition etc)

No	Papers
1:	11
2:	3
3:	10
6:	20
7:	12
8:	3

} Redefine the papers under each category into sub-categories.

NOTES OF
THE FIRST SCIENTIFIC COMMITTEE MEETING
FOR THE FORTHCOMING
27TH ISCTRC CONFERENCE HELD ON 19TH MAY 2003
IN THE AU/IBAR CONFERENCE HALL

The First Scientific committee Meeting for the forthcoming 27th ISCTRC Conference to be held in Pretoria, South Africa was held in the AU/IBAR Conference Hal on 19th May, 2003 at 3.00 p.m.

Present:

Dr. Solomon Haile Mariam	-	**Chairman**
Dr. B. Bauer	-	**Member**
Dr. J. Maitima	-	**Member**
Dr. Grace Adira Murilla	-	**Member**
Dr. Pamela Akinyi Olet	-	**Member**
Mr. Francis Oloo	-	**Member**
Dr. Mary Owaga	-	**Member**
Mr. Harald Rojahn	-	**Member**
Mr. Martin Rainavoson	-	**French Translator**
Mrs. Respah O. Omolo	-	**Secretary**

Absent:

Dr. J.J. McDermott	-	Member
Dr. Joseph Ndung'u	-	Member
Dr. R. Saini	-	Member - (Absent with apologies)

OPENING REMARKS

Dr. Solomon opened the meeting by welcoming warmly all those present. He thanked the Scientific Committee Members for accepting to serve as Committee Members for the forthcoming 27th ISCTRC Conference.

He then explained that the purpose for setting up the Scientific Committee was to screen all the submitted articles for the 27th ISCTRC Conference. It therefore called upon the members to read, categorize, assess the suitability or disqualify unsuitable abstracts. The Committee will continue with its deliberations for about a period of two to three months. He stated that by the end of 30th April, 2003, which was the deadline for submission of the articles, he had received approximately 124 abstracts. He however further stated that an allowance would be given for receiving more articles beyond the set deadline until **31st May, 2003.**

He proposed that the following Committee Members be assigned the screening of the abstracts as follows. He explained that he paired committee members to work as a team to enable them consult each other and come up with concrete report on their findings.

Country Reports	-	Dr. S.H. Mariam
Protozoology and Immunology	-	Dr. J. Ndung'u and Dr. G.A. Murilla
Entomology	-	Dr. Bauer and Mr. Oloo
Human Trypanosomiasis	-	Dr. J. Ndung'u and Dr. G.A. Murilla
Animal Tryps and Diagnosis and Genetics	-	Drs. P.A. Olet and Dr. Mary Owaga
Vector Control	-	Dr. Bauer and Mr. F. Oloo
Land use and Community Participation	-	Mr. Harald Rojahn and Dr.. J. Maitima
Environment/GIS	-	Mr. H. Rojahn and Dr. J. Maitima

Their work will result in making decisions on the abstracts as follows

1) Oral Presentations
2) Poster Presentations OR
3) Disqualified as unsuitable

All Committee Members were happy and ready to participate in their various assignments. Dr. Solomon commended them all for their full support of this most important role of the 27th ISCTRC Conference. He also said that due to budget constraint, AU/IBAR he will make a proposal to the Director to pay a token lunch allowance of KShs.2,000/- only per meeting attended. to those Members who were neither working with AU nor its Projects.

There being no other items for deliberation, **the date of 16th June, 2003 at the same venue and time was proposed and confirmed for the 2nd Scientific Committee Meeting.**

The Meeting terminated at 4.05 p.m.

Dr. Solomon reported that the Proceedings for the 26th ISCTRC Conference held in Ouagadougou, Burkina Faso would be finalized soon and circulated to all the participants. At this juncture, he thanked Dr. Mary Owaga for working tirelessly processing the proceedings. He also thanked Dr. Bauer and Mr. Oloo for their assistance in categorizing the abstracts submitted for the 27th ISCTRC Conference in readiness for consideration by the Committee.

Mr. Martin Rainavoson raised concern over the deadline for receiving abstracts. He explained that previously scientists did not respect the deadlines and were allowed to continue submitting their articles even during the Conference! This, he stated, causes confusion and proves over-taxing as these articles have to be translated, categorized and synchronized among others already prepared. Dr. Owaga who too had witnessed and experienced this absurdity during the Ouagadougou Conference supported him.

Dr. Solomon explained that he allowed receipt of late articles in order to encourage scientists who had struggled to contribute them. He felt that rejecting them would tantamount to demoralizing the individual scientist who may have put in enormous efforts in producing the articles.

It was therefore agreed that for the smooth running of the Conference, the deadline for the receiving of the late abstracts should be fixed for 31st May, 2003.

Mr. Rainovoson also raised the issue of establishing a definite number of articles and stressed that the participants must adhere to the stipulation of submitting the abstracts in both English and French.

Dr. Solomon once more explained that scientists are capable of dealing with as many articles as possible when they break into sessions. Hence there was no need of limiting abstracts by setting a definite number.

GENERAL MODALITIES/GUIDELINES

Dr. Solomon stated that the abstracts have been categorized into 8 groups namely:-

1) Country Reports
2) Protozoology and Immunology
3) Entomoogy
4) Human Trypanosomiasis
5) Animal Tryps and Diagnosis and Genetics
6) Vector Control
7) Land use and Community Participation
8) Environment/GIS