ナイジェリア・ジョス大学
医学研究プロジェクト
巡回指導調査団報告書

昭和60年12月

国際協力事業団
医療協力部

はしがき

ジョス大学医学研究プロジェクトは昭和57年7月に発足し本年でその協力期間の約3分の2を終了し，すでに四つの協力分野（微量金属分析，甲状腺腫，小児下痢症，衛生昆虫）のそれぞれの分野で一定の成果があがりつつある。

それらの成果をふまえつつ，残された1年半余の協力期間をさらに有意義たらしめることを目的として，当事業団は昭和60年11月に，畠山茂東京医科歯科大学教授を団長として巡回指導調査団を派遣した。本書はその報告書である。

ここに調査団に参加され調査・協議の労をとられた団長，団員各位，並びに平素より本プロジェクトに御協力頂いている関係協力機関各位に対し厚くお礼申し上げるとともに，ひきつづきの御支援，御協力をお願いする次第であります。

昭和60年12月

国際協力事業団

理事　末永昌介

目　　次

I. 調査団構成，派遣期間及び日程

A. 構　　成

1. （団長）　畠　山　　茂（はたけやま　しげる）
東京医科歯科大学医学部教授（病理学）

2. 多　田　　功（ただ　いさお）
熊本大学医学部教授（寄生虫学）

3. 西　垣　　克（にしがき　まさる）
東京大学医学部保健学科助手

4. 加　藤　　宏（かとう　ひろし）
国際協力事業団医療協力部

B. 派　遣　期　間

昭和60年11月16日～同年11月28日
（西垣・加藤団員は11月13日出発）

C. 日　　程

Nov. 19 (Tu)	0950	arrive at Jos WT 300 Plateau Hotel
	1500	*Briefing. Current condition of the Project* (Japanese Staff) (Dr. H. Takahashi's house)
	0900	Visit the office of Prof. Ejike (Trace Elpment について打合せ)
	1000	Visit the Office of Dean (プロジェクト運営上の問題について打合せ)
	1100	Visit the Office of V.C. (副学長) (表敬)
	1300	Visit. Binchi Village
	1930	Party : by Dean (Hill Station Hotel)
21 (Th)	0900	*Visit the Lab. Medical Ent.*
	0930	Visit the office of Prof. Iuwala (畠山・西垣はCommunity Health にて下痢症サーベイ打合せ)

	1400	Visit the Lab. Olinical Pathology Visit the Lab. Microbiology
	1430	Visit the office of Mr. Shonekan.
	2000	receive invitation. Prof. Ikeme's House
22 (F.)	0900-1200	Meeting. Discussion about the future Plan.
	1400	visit the office of Prof. Isichei
	1900	party. by Prof. Hatakeyama. (Plateau Hotel)
23 (Sa)	reserved	
24 (Su)	1020	leave Jos. WT 301.

Ⅱ. ナイジェリア側主要関係者一覧

Prof. Onazi, V. C.	V. C.
Prof. Ikeme, A. C.	Former Chairman. Prof. of Medicine
Prof. Oji, E. O.	Dean
Prof. Jain, S. P.	Prof. Anatomy
Prof. Anekwe, G. E.	Prof. Biochemistry
Prof. Ejike, C.	Prof. Zoology
Prof. Iwuala, M. O. E.	Prof. Zoology
Prof. Adaeguke	Prof. Mathematics D. V. C.
Dr. Wysokowski, J.	Head, Pharmacology (JICA Office)
Dr. Ubom, G.	Biochemistry, Counterpart
Dr. Sen, K. K.	Biochemistry
Dr. Chidobem, I. J.	Zoology
Prof. Isichei, U. P.	Prof. Clinical Chemical Pathology
Dr. Das, S. C.	Clinical Chem. Pathology
Dr. Kumar, V.	Microbiology.
Dr. Robert, D. M.	Zoology. Med. Ent.
Dr. Akoh, J. I.	Zoology.
Mr. Shonekan, R. A. O.	Head. Microbiology
Mr. Okoronkwo, M. O.	Community Health. Technologist
Dr. Otti	Community Health
Dr. Ogezi, A. E.	Geology & Mining
Dr. Lazowski, Z.	Head, Paediatrics
Dr. Swiatkowska, I.	Paediatrics
Dr. Szlachetka, R.	Paediatrics
Mr. Isa, Y. I.	Dept. Bursary
Mr. Nwoke	Zoology

Ⅲ. 調　査　結　果

A. 1986/87年協力計画

1 研　究　計　画

a. Trace Element

1. 1985年の活動実績

'84年から本年にかけてのこのグループの活動状況について責任者のPro. Ejikeと協議を行なった。このグループは，四つのサブグループから構成されており個々に活動を行なっている。Dept. Geology and MiningとDept. Zoologyについては，チームリーダーの高橋先生が作成した配布資料（巻末資料参照）においてもわかるように着実に研究が進行している。供与器材も活用し徐々に論文が作成されてきている。

Dept. Biochemistryについては同様であるが，特に実質的な活動の中心人物であるDr. Ubomに個別にあい協議を行った。長期専門家の野田氏が帰国後も，AASを初めとして供与器材の維持管理を全て中心的に行なっており，研究も着実に進展している。特に新たにプラトー州の南部の低地地域において水のサンプリングを開始しており，従来の北部高地地域との比較研究を進めている。

以上三グループに比して研究活動の遅れが目立つのがDept. Clinical Chemical Pathologyである。研究実績においてもみるべき物がなく従来どおりの計画のみにおわっている。JICAからの供与器材の到着のみをあてにしており，自らの部門における研究器材で人員の整備などできるかぎりの努力が少く，今後の研究活動の進行において大いに疑問が残る部門である。JICAのプロジェクトがあと残り少くなった状況においても，なお初年度と同じ計画のみが提出されていることには根本的な疑問があるといわざるを得ない。他の部門が供与器材を活用しつつ不充分な研究環境の中で自ら努力しているのに比してあまりにも対応が安易である。まとめられた論文も少く，計画のみぼう大でかつ長期にわたるものを予定していることにも疑問がある。

2. 活動上の問題点

供与器材はおおむね各研究部門で研究に活用されている。特にAASに関しては，Pr. Ubomの努力において充分に維持管理されている。しかしながら，先の長期専門家野田氏の報告でも明らかなように，ジョス大学において，一人Dr. UbomをのぞいてAASの操作維持管理について技術を修得した人物がいないことが大きな問題点である。その理由は，JICAで用意した研修プログラムを受けず，ただ単にAASを利用したいという希望者のみ数多くいることである。このように無原則に利用を希望する人間が多いことでDr. UbomはAASを死守することにかなりな努力を要している。そこで将来的

にも少くとも半年に一度ぐらいはメンテナンスおよび技術指導のために，JICAとして短期の専門家を組織して送ることが望ましい。

次の問題点としては，活動実績で述べた如くDept. Clinical Chemical Pathologyの問題である。研究責任者としてのPro. Isichei の部門の管理能力に根本的な疑問が残る。人員の確保および器材の有効利用といった点において，研究活動を進める上での基礎的な整備や体制が欠落していると考えられる。

3. その他

本プロジェクトも実質的に約2年を経過し各部門での論文が徐々に作成されてきている。将来的にはこれらの個々の論文がヨーロッパ等の学会誌に投稿されることが望ましい。しかし，そのレベルまで到達するにはまだ少し時間が必要である。そこで，Pri. Ejike からジョス大学の内部で従来行ってきた研究活動を印刷し広く情報として活用していくことの必要性が強調された。そこでJICAの援助として今後なんらかの印刷に関する器材の供与の申し入れがなされた。

4. '85／'86年活動計画

本年8月に東京で開かれた国内委員会で提示された溝口先生の提案をうけて，10月9日にジョス大学において関係する四部門の会議がPro. Ejikeのもとで開催された。この会議にはDr. Ubomは理由があり欠席し，文書にて報告を行っている。この詳細については，巻末資料p29. p7. p9. p10のとおりである。今後はいままでの成果を論文としてとりまとめていく方向で研究活動が進展することが望ましい。四つの部門から合計15の論文テーマが提示されている。これらについては，溝口先生より事前にコメントがなされているが，特に問題があるのはDept. Clinical Chemical Pathologyの部門である。従来研究活動が進展していない中であらたに計画のみを拡大しあたかも新しいプロジェクトのための計画のような印象すらうける。ある面では，JICAの供与器材の配布や長期，短期の専門家派遣に問題がないとはいえないが，ジョス大における自助努力の不充分さが目につく。とくにPro. Isichei は日本側との会議などに業務上の理由もあるが，欠席が多く，相互の情報交換や意見の交流が不足しがちである。今後はこのような問題を克服し提案しているテーマの論文作成を期待するしかないといえよう。

そこで，できるかぎり早い時期にこの部門の体制のたて直し，および供与器材の有効活用のための技術指導等の問題を解決するために生化学，内分泌学等の領域の短期専門家を派遣する必要性が高いと考えられる。

b. 甲 状 腺 腫

1. '84／'85活動状況

'84年度に報告された内容は主に疫学的な調査の結果であるが，中心的に活動していたコミニィティヘルスの責任者であったPri.Tiwariがインドに帰国してからは，本格的な調査は行われていない。特にコミニィティヘルスとの共同関係はくずれ，地区をかえて少しずつDr.Das を中心に維続されている。この間この疫学調査の結果とTRACE ELEMENT GROUPの結果とをつきあわせた論文の作成が試みられたが，DATAの相互利用の上で問題があり完成するには至っていない。

この問題は将来的には大きな問題であり，ジョス大プロジェクトとしての統一性や学問の進展をはかる上で，正しいモラルの確立と研究を進める上での独自性の保障がなされる必要がある。そこでDATAの処理分析についての共同作業や利用について大至急原則を再確認するとともに，あるルールを作成する必要性がある。

コミニィティヘルスの協力が得られないまま，疫学調査を維続している所にも問題がある。

Clinical Chemical Pathologyの部門としては約280人の対象者から採血し，enzyme linked immunoassay 法を用いて，thyroid function を6種のパラメーターを用いて分析を行なった報告がなされている。これらの対象者は異常者と正常者を比較検討しているが，対象者の選定方法などに少し疑問が残る。またDATA処理が初歩的な段階にとどまっていることも問題である。またこの分析過程において分析者との間で，分析結果をめぐるトラブルがあり，未だ解決していないことがある。

2. 活動上の問題点

活動実績の所で述べた如く，この部門は何かとトラブルの多い所である。研究責任者の能力の問題，研究活動の管理面での問題，人間関係の問題など様々な問題が山積している。とくにデーターの分析や解析，利用といった所も主たる問題があるといってよい。更に，研究に従事する人間の移動がはげしく，部門内部に何か本質的な問題が内在しているように考えられる。供与機材において'84年に供与した器材（電気泳動装置）は必要物品が欠落しているとのことで現在まで一度ためされただけで現在は全く使用されていない。

現在，搬送中にこの欠落が生じたのかどうかを調査中であり，その結果しだいで早急に解決の方策をとる必要性がある。実験を行う場合に必要な周辺状況の整備などの面でも立ち遅れが目立ち，すでに供与された器材などにおいても数年間にわたり設置されているものもあり，有効に活用する自助努力が極めてとぼしいといえよう。

本年に提出された報告においても供与物品の要求のみ多くくり返され，計画どおり研究が進展する可能性は乏しいと判断できる。

3. '85／'86活動計画

計画の立案のみは壮大であるが，実現可能性においては大いに疑問が残る。

最終的な分析方法までを考慮にいれた，より緻密な研究計画の立案が望まれる。

さらに，周辺整備や終末処理を考慮することなく，Radio immunoassay法の活用を望んでいるが，現在の状況では簡単に研究計画として承認することが困難と考えられる。現在のスタッフと研究環境において，より具体的な実現性の高い研究計画として計画そのものを早急に作成しなおす必要性がある。

なおJICAとして供与すべき物品はすみやかに供与し活動をしうる上での活性化をより積極的にはかる必要性がある。従来はJICAチームとしても日常的な連絡調整や意見交換などの不足もあり，様々な点でこの部門に関しては後手後手に対策がなされており，最終年度に予定されているシンポジウムにおいても着実な研究報告がなされるかも危まれる。また，現在研究の 中核として活動しているDr. Das がインドに来年度に帰国する予定があり，現在の状態ではこの段階で研究活動が中止される危険性がある。現地側として有効なカウンターパートを見いだすことは困難であり，日本側としても早い時期に短期専門家を派遣し，かなり強力に研究協力をおし進める必要性がある。

c. 小 児 下 痢 症

1. '84／'85年活動実績

'84年度供与器材の到着によりJICAラボとしての整備はほとんどなされたと考えてよい。さらに短期の専門家が数多く協力し，研究実績がめざましくあがっている。巻末資料に報告されているショートレポートも8編を数え，当初の研究計画であるショス大附属病院を中心とした小児下痢症の細菌学的研究は一応の成果を得ている。本年度にはいり日常的な学童の下痢症の実態および細菌の保菌状態に関する学校での検診活動もなされ，研究活動のひろがりがみられる。また，日本への研修者としてA. アニが4ケ月の技術研修を行っており，実験環境および実験技法の上でもある程度の技術移転がなされたといえよう。現在はT.高橋長期専門家を中心に，いままでのデーターをコンピューターに入力し，個々の結果のより綿密な研究成果を得るための検討を行っている。データー分析を深め，相互のデーターの関係について個々の論文を集大成する準備にかかっている。また，'85年にはDr秦により，病棟および乳児検討のデータやカルテの整理により，ジョス近郊の小児の病気や健康状態に関する有効なデーターも収集されている。

さらに，本プロジェクトとしての大きな研究事業であるフィールドサーベイの準

備に関してもM.高橋長期専門家やコミュニティヘルス部門のDrオッティや技術者のオコロンコを中心に検討が進められ実現にむけての具体的な計画がなされている。

2. 活動上の問題点

従来から指摘されている如く，Dept.Microbiologyに将来の研究活動をになっていく有効なカウンターパートが見い出し得ない所に主たる問題点がある。現在は長期専門家のM.高橋氏の帰国により実験室はT.高橋氏のみの活動になっており，このプロジェクトの進行中に附属病院の臨床細菌検査部門への技術移転や人物の再教育に力をさいていく必要性があろう。

とくに86年に実施を予定しているフィールドサーベイの時には短期間に多量のサンプルを処理する必要性があり，検査能力の向上とともに現地側からの協力体制の確立が早急に望まれる。将来的には実験室の日常的な運営や維持については，なるべくジョス大側の人々にゆだね，日本人チームとしてはアドバイサー的な機能に徹していく必要性がある。

3. '86／'87年の活動計画

従来行なってきた病院からの検体収集と分析は徐々に技術移転にともない，日本人専門家の業務からはずし，いままでの研究成果の深化をはかる。さらに本プロジェクトの集大成ともいえる統合したフィールドサーベイの中心的な部門としての活動を行う予定である。特にコミニィティヘルスとの協力体制の確立とともに，オンコセルカ症やゴイターグループとの総合的な健康調査の活動を進行する予定である。

今回はM.高橋長期専門家およびコミュニティヘルスの技官のオコロンコ氏との協議による研究計画について細部の検討を行った。特に新しいコミュニティヘルス部門の責任者となったDrオッティとこのサーベイについて協議を行なった。彼女は社会学者でありフィールドサーベイについては豊富な知識をもっており調査後のデーターの有効な利用や地域保健活動への活用等の面で，原則的な方向性の確認が成立した。以下フィールドサーベイの実施要領について概要を述べる。

調査目的　モデル地域における学童および地域住民の健康障害の実態を包括的に調査研究する。特に下痢症に関してその発病状況および，細菌の保菌状態と細菌学的分析，オンコセルカ症の流行状況，ゴイターの実態について調査を行う。また調査活動を通じて学校児童の健康検診の方法や地域保健活動の将来的な展開方法について検討し，地域住民の健康問題の解決および予防健康増進活動に寄与することを本研究の主たる目的とする。

調査対象地域　プラトー州バサ地区

調査対象者　一次調査　バサ地区，4小学校児童

二次調査　4小学校児童の居住する小集落25の集落全数調査

調査方法　一次調査　各地区の小学校において各クラス毎に小学校児童を中心に質問紙調査，生体計測，オンコセルカ検診，ゴイター検便，検尿を実施する。

二次調査　対象とした児童の居住する地区の全数に対して，各世帯毎にコミュニティヘルスの指導の一環として，学生の演習をかねて訪問面接調査を行う。次に構成員全員に対して，生体計測，オンコセルカ，ゴイター検診，検便，検尿を実施する。

調査日程　一次調査　'86年1月20日頃から2月中に行う。

二次調査　'86年3月初旬から4月初旬にかけて実施する。

調査器材　調査用紙－最終的なデザインの決定および印刷は日本側で行う。

調査器材－すでに供与されている物品以外の物で，新たに必要なものは早急に日本から現地へ搬送を行う。

留意点

プラトー州におけるジョス大学の初めての本格的なフィールドサーベイにあたり，現地側の良好な協力体制の確立が不可欠である。そこで調査対象児童，学校教師部落長，バサ地区長，行政，保健所等関係機関などに調査協力費を用意する必要がある。

調査を行う上での問題点

1. 調査を実施する側において本調査の目的と意義を充分に理解し，調査員相互の役割と果すべき機能についてよく納得し，調査にあたってはチームワークが不可欠であることを徹底すること。
2. 調査実施マニュアルを作成し，現地対象者に本調査の目的意義について十分なコミュニケーションをはかるように努めること。
3. 特に一次調査の成否については学校長および教師の理解と協力体制が不可欠である。各クラス担当教師は調査員としての役割を担うほどのキーマンであり，円滑に調査が実施できるかどうかの鍵である。そこで，充分なコミュニケーションと連係プレーの確立が望まれる。

まず第一に教師から各児童に本調査の意義と目的について充分に児童に説明し，調査内容についての方法等やり方について教育を徹底して行う必要がある。この為には教師用のマニュアルを作成する必要がある。

とくに生体計測の内容や意味，検便，検尿と検診の流れについて留意して児童の理

解を得るようにつとめなければならない。児童が喜んで調査に協力し，不用意な拒否反応や恐怖心をとりのぞかれて本調査が実施されるのでなければ，次に予定されている二次調査の集落調査は実施不可能となると考えられる。

4. 一次調査においては，調査票，生体計測測定結果，検便用器，検尿用器等の名，氏名を確認し，まちがいのないようにしなければならない。一次調査時はこの意味において要所要所に日本人チームメンバーを配置し点検するとともにジョス大メンバーに運営方法に関する理解を徹底し実際に実施できるように指導する必要がある。

5. 本フィールド調査を行う上で調査対象者に関する利益を還元する為に，現実にかかえている健康問題へなんらかの解決の糸口をつけるためにも，ジョス大附属病院の臨床医師とくに小児科医の協力を得てこの問題に対処するとともに，病院側の積極的な協力を必要とする。またこの際必要となるある種の医薬品についてはジョス市で入手可能な物については本プロジェクトとして購入し，調査終了時には病院に供与する。

6. 調査を円滑に進行する為にはジョス大側に協力体制の確立が不可欠であり，強力なリーダーシップをとれる人のバックアップが不可欠である。幸いなことにPrイケメが生体計測の部門で脈搏や血圧，尿中のNa^+K^+の測定に興味をしめしており，本フィールド調査に積極的に参加の申し入れがある。上記の役割を担う人物としては最適な人物であり，これらのことを考慮にいれてフィールドサーベイの構成を検討する必要性がある。

7. フィールド調査後の現地側への対応としては様々な衛生教育や予防活動なども含めて，コミュニティヘルスの部門への強力な援助活動を展開する必要性がある。とくに現地での行政や学校当局，地区長等への連絡調整はコミュニティヘルス部門の積極的な活動が不可欠である同部門は従来，ゴイダー調査におけるPr Tiwari をはじめとして，本プロジェクトの当初より深い理解をもち積極的な協力体制にありながら，'84年度まではＪＩＣＡからの供与器材等にもみるべき物がない状況下にある。'85年度以降の供与器材の項目や配分においてはこの点を充分に配慮を要する。

8. 4月初旬に検体収集がすべて終了した時点で，実験室の機能を最大限活用して早急に検査結果をだしてすみやかにデーター解析の体制に移行しなければならない。フィールド調査実施時には，四人の短期専門家の派遣がほぼ決定されており機能面では問題はないと考えられるが，データーの記入および整理については人員の配分計画を早急にたてる必要性がある。今回使用する調査票はコピーの3枚とれるものを用いるので，ジョス大と日本，現地の三ケ所にそれぞれ保管し，相互に利用できる体制が望ましい。そこで，記入整理の終った調査票は作業が終了次第1部を日本に送り，ジョスと同時にデーター解析の作業を開始する。とくに日本では大型計算機の利用により，

じん速なデータ－処理も期待できるので最終年度のシンポジウムにむけての論文作成に間に合うような体制づくりが必要である。

d. 衛 生 昆 虫

1. 緒 言

ジョス大学医学研究プロジェクトの衛生昆虫学部門に対しては，これまでに角坂，塩飽，多田，高岡の各専門家が派遣され，主として，ブユとオンコセルカ症に関する研究が主体になって研究協力が進められた。一方，国内委員会においても加納委員から，この部門は「フィラリア症ことにオンコセルカ症とその伝搬についての研究協力」を主体とする旨の方針が明らかにされたので，以後の協力内容についての基本方針が定まった。

今回のサーベイにおいては協力相手であるジョス大学理学部衛生昆虫学部門（主任イウアラ博士）とそれに関連する研究者，Ph.D. コース学生からヒアリングを行なった。他に，個々のカウンターパートとの面接，ビンチ地区視察，日本側専門家との面接を通じ得た結論を以下に述べる。

2. ジョス大学衛生昆虫部門の研究計画（別紙プロジェクト 1－17,〔PP.15～17〕）について

a) プロジェクト№1－7はすでに研究が終了したものとのイウワラ教授の説明であった。これらについては早急にとりまとめ，しかるべき雑誌に発表することを勧告した。

b) 現在，WHO の研究費をうけて進行中のブユ，蚊についてのロバーツ，アーピング・ベル博士らの研究についてはひきつづきその重要性が認められ，JICA もそれをサポートすることがのぞましい。特にブユを研究しているロバーツ博士については今後の日本人研究者との共同研究を依頼した。

c) プロジェクト 14 と 15 はそれぞれオンコセルカ伝搬ブユとオンコセルカの染色体についての細胞遺伝学的研究である。後者については一部，熊本大平井博士らにより解明されているが，西アフリカにおけるオンコセルカ症の多型性を考慮すればいずれも極めて重要な研究である。このためこの２つに対しては　にJICA の協力・日本人専門家との共同研究を勧告した。

d) プロジェクト17についてはデザインが未熟であり，技術的背景の欠除とずさんな研究計画（経費・方法論）で構成されているので，これはＪＩＣＡがサポートしないことを勧告した（別添オージ委員長あての手紙を参照されたい）。

3. 研修員派遣希望について

イウアラ教授からアコー博士を日本においてしかるべき研究機関で№ 14，15 の課題を研究させたい希望が出された。アコー博士はエジケ学理部長によれば折紙つきの素質のある研究者であるという。ロンドン大学で蚊の染色体の研究をした経歴をもち

すでに論文・数編が出されているという。従って，これを受け入れるとすれば熊大寄生虫病学教室が最も適当であり，基本的にこれを受け入れることにしたいと返答した。目下，履歴書と論文を請求中であり，プロジェクトの進行と熊大の都合，本人の希望を組合わせてこれを決めたい。なお熊大のほか東京医歯大，愛知医大，大分医大など関連教室にも短期間研修をお願いしたい。

4. 衛生昆虫研究室の使用希望について

目下，高橋リーダーにより主として管理されている上記研究室について，研究者・学生にもっと簡単に使わせてほしいというイウアラ教授の希望が述べられ，これには基本的に同意する。但し，でたらめな使用により，機器の破損・紛失が懸念されるから，先般オージ医学部長に提案した管理委員会（running committee）の管理のもとにとり行なわれるべきことを勧告した。

なお車の専属使用についてもつよい希望があるがこれに対する見解も同様である。

5. 論文発表時の著者の問題について

オンウルリ博士から自分の指導しているPh. D. コース学生が参加している論文に指導教官の名前が著者の中に入っていない旨，クレームが述べられた。これについてはジョス大の慣習もあろうから，直接何らたづさわっていない場合でも若干のアレンジが必要かもしれない。現今の日本や欧米の習慣どおりにやると不測の問題がおこりかねない。

6. 国際学会等にナイジェリア人研究者をJICAの費用で派遣してもらいたいという希望について

JICAが協力している研究の内容を海外での学会（たとえばオーストラリアでの国際寄生虫学会）で発表する意義を考え，旅費の援助してほしい旨，イウアラ教授から希望が出された。これはJICAの規則から困難である旨，加藤団員から返答した。

7. ビンチ地区での綜合調査と本部門との関連

衛生昆虫部門には本年11月から内田専門家が派遣され1年間滞在予定である。同氏に対しては幼児下痢の調査を援助してほしいという要請があった。これについてはテクニシャン2人を指導する程度の協力を行なう予定である。

次にビンチ地区において，他調査と平行して全対象についてオンコセルカ症調査を行なうかどうかについての検討がなされた。同地は訪問した感じではオンコセルカ症流行は殆んど無い可能性があり，この場合，最初の数回の検皮法で去就を決めたい。即ち非又は低流行地であればオンコセルカ調査はとりやめることが望ましい。従って，眼科学的サーベイもこれをとりやめたい。

8. 衛生昆虫部門の今後の専門家派遣計画について

さきに高岡専門家は7－8月においてジャラワ川水系に全くブユの発生をみとめなかったが，10月英国のハム博士らは同地区で多数のブユを採集して帰っている。このため衛生昆虫学的調査のためには1986年9－11月がのぞましく，先に1986年4－6月に予定していたブユおよび寄生虫の専門家派遣を1986年9－11月と変更したい。なお眼科学専門家（山田博士を予定）については従来どおり4又は5月から2－3ケ月間としたい。

9. 結　語

ブユについてはナイジェリアでは長年にわたる英国の研究者（たとえばクロスキー博士）による研究成果が多く，大規模なオリジナリティの高い研究を短期間にまとめるのは難かしい。従って，細胞遺伝学的技術を加味して，プラトー州におけるオンコセルカ伝搬ブユの分布，あるいはブユーオンコセルカ複合体についての地域別比較など地道な研究を行なうのがよいであろう。

寄生虫および臨床的な立場からは中南米型オンコセルカと西アフリカ型オンコセルカとの比較研究を進めるのが望ましい。更に余裕があればオンコセルカの病原性についての実験（内田専門家）などもこれをすすめてほしい。

いずれにせよ研究は機器があれば出来るという安易な発想を排し，現在できる研究と方法をつかんで行くよう日本人専門家は指導して行くのが望ましい。

なお，サーベイのアウトラインについては終了時点で，プロジェクトのチェアマンであるオージ医学部長あての手紙でこれを通告した（CC. 畠山委員長，イウアラ教授，高橋リーダー，〔PP. 18～19〕）。

UNIVERSITY OF JOS

DEPARTMENT OF ZOOLOGY

Phase IV Project Proposals for Studies by the Unijos - JICA Medical Entomology and Parasitology Group (1985/86).

In furtherance of the Research works for phase I, II and III, the following projects are listed for continuation into the phase IV period; i.e. 1985/86.

Project 1: "Studies On The Distribution Of Black-flies (Simulium spp) on Jos Plateau"

- Prof. M.O.E. Iwuale and Mr. M. Maduabum

Project 2: "Effect of Water Velocity On Black-fly Relative Abundance"

- Dr. D.M. Roberts and M.Sc. Student

Project 3: "Effect of Temperature and Relative Humidity On Pupal Survival of Black-flies"

- Dr. D.M. Roberts and Mr. D. Boakye

Project 4: "Distribution Of Immature Mosquitoes Associated With The River System In Jos Plateau"

Dr. R.J. Irving bell and M.Sc. Student

Project 5: "Study Of Seasonal and Vertical Distribution Of Tree-hole Mosquito Breeding"

- Dr. R.J. Irving-bell

Project 6: "Studies On The Prevalence and Distribution Of Onchocerciasis In Plateau State

- Dr. C.O.E. Onwuliri, Mr. E. Ibeke and M.Sc. Student

Project 7: "Study of The Seasonal Abundance and Population Characteristics Of Immature Stages Of Black-flies In Jos Plateau Area"

- Prof. M.O.E. Iwuala and Mr. M. Nduaburn

Project 8: "Effect of Predators and Type Of Substrate On The Relative Abundance Of Immature Black-flies"

- Dr. D.M. Roberts and M.Sc. Student

Project 9: "Studies On The Dispersal Of Adult Black-Flies"

- Dr. D.M. Roberts and Dr. R.J. Irving-Bell

Project 10: "Niche Distribution In Relation To Physiological Adult Population Of Black-flies and Mosquitoes"

- Dr. R.J. Irving-Bell, Dr. D.M. Roberts and Dr. J.I. Akoh

Project 11: "Some Factors Influencing The Endemicity Of Onchocerciasis In The Jos Plateau, Nigeria"

- Dr. C.C.E. Chmulirk, Dr. I.[illegible] and Mr. B.E. Nwoke.

Project 12: "A Study of Age Composition of Mosquito populations of the Jos Plateau

- Dr. J.O.A. Onyeka, Prof. M.C.E. Iwuala and Mr. G.I. Anyawu.

Project 13: "Host feeding Preference and feeding patterns of Mosquitoes of the Jos Plateau

- Dr. J.O.A. Onyeka, Prof. M.C.E. Iwuala and Mr. G.I. Anyawu.

PROJECT 14: Cytotaxonomic analysis of the black flies, Similium damnosum complex from Jos Plateau Nigeria.

Investigator(s): DR. John I. Akoh & Mr. E.B. Alo

PROJECT 15: Cytogenetic analysis of Onchocerca volvulus Chromosomal Polymorphism.

Investigator(s): DR. John I. Akoh

Project 16: A study of improved diagnostic methods for Onchocerciasis based on modified Mazzotti test trials and filaricidal drug combinations.

Iwuala, M.O.E, Onwuliri, C O E
and Udofa, U.E.
Department of Zoology
University of Jos.

Project 17. Bioassay of Homologous and distinctive Onchocerca volvulus antigens using enzyme Linked Immuno-Sorbant assay approach

Iwuala, M.O.E, Onwuliri C.O.E. and Udofa U.E.
Department of Zoology
University of Jos.

23 Nov.,1985

Dr.E.O.Oji

Dean, Faculty of Medical Science
University of Jos
Chairman, JICA-Jos University
Program, Nigeria

Dear Dr.Oji:

I highly appreciate your excellent chairmanship in the on-going JICA-Jos University Cooperation Programme.

On 21st Nov.,at the office of Dr.Iwuala, I received briefing on the research projects concerning medical entomology at Nigerian side. I fully acknowledge enormous effort of Dr. Iwuala on this matter and also the leadership in the research.

With regard to the research projects which were already completed (projects 1-7), I recommend to publish them immediately by adequate manner in order to contribute through distribution. Studies by highly qualified scientists would be supported by both WHO and JICA.

Among the proposed items for the future, I recognize the importance of cytogenetic studies of Simulium and O.volvulus (projects 14-15). This is partially completed by our laboratory particularly in Latin America and has basic priority in the understanding of onchocerciasis in Nigeria. I recommend JICA to support intensively these studies by supplying necessary consumables, reagents and instruments such as phase-contrast microscope which is already present in the laboratory.

However, I cannot recommend the project 17 in its present form, because 1) the experimental design is obscure and immature, while sophisticated techniques are required for the antigen extraction and purification and ELISA. 2) From the viewpoint of cost-efficiency, this study is not recommendable for a Ph.D. course student. The target immunoglobulin is not mentioned, expensive reagents (collagenase and enzyme conjugate etc) were not mentioned in the schedule. ELISA kit (N 2,500) is not clearly defined so the standardization of antigen, conjugate and samples seems difficult by the ordinary kit. Unfortunately, for this reason, the applicants should concentrate on project 16 cooperating with medical doctor(s).

On the dispatch of Dr.Akoh to Japan, I agree basically the proposal of Dr.Iwuala. Dr.Hirai of my department will be a good colleague on this matter. I request his curriculum vitae and some of the original papers.

I agree to open the existing laboratory for the researchers authorized as the members of medical entomology group. I recommend that the maintainance of all the instruments should be completed with full responsibility of the users under the regulation of the running committee. Otherwise, random use of the facilities without necessary knowledge and rule will be quite harmful.

I understand the necessity of an automobile vehicle in the field surveys by entomological group. I expect the efficient use of the vehicles available.

On the items of requested items, I recommend Dr.Iwuala to discuss with Dr.Takahashi in its details, because of obscurity in some items, such as beaker, ivermectin and etc.

I sincerely appreciate your warm hospitality for us while we stayed here in Jos for the evaluation. I expect fruitful development of the cooperateive project due to Nigerian calendar.

Sincerely yours,

Isao Tada, M.D.
Professor and chairman
Kumamoto University
Medical School

Member of JICA delegation
to UNiversity of Jos

C.C. Dr.M.O.E.Iwuala
Dr.H.Takahashi
Dr.S.Hatakeyama

2. 日本側投入計画

a. 機 材 供 与

現在ナイジェリア側で来年度要望を各部からとりまとめ中。原則として，新規の大型機材よりは供与済機材のパーツ，消耗品を中心としたい旨の考えを説明しておいた。

b. 専 門 家 派 遣

(1) Trace Element — 溝口委員提案通り説明，先方了承

(2) 甲 状 腺 腫 — 甲状腺専門家（出来ればM.D）の派遣を検討
（但し，ナイジェリア側へはコミットせず）

(3) 小 児 下 痢 症

フィールドサーベイ実施チーム

高 橋（基）	61年1月初旬～4月初旬
佐 藤	61年1月初旬～3月下旬
今 川	61年2月下旬～3月下旬
谷 口	〃 ～ 〃

（疫学専門家派遣の可能性も検討すべき）

(4) 衛 生 昆 虫

寄 生 虫（内田）	60年11月～61年11月
眼 科（山田）	61年 5 月～61年 7 月
衛生昆虫（未定） 寄 生 虫（未定）	61年 9 月～61年11月

c. 研修員受入れ

61年度も3名程度は受入れ可能である旨表明した。

B. 研究成果のとりまとめ及び発表

1. 論　文

今回の調査により4つのサブ・プロジェクト毎の今後の協力計画の概要がほぼ合意された。今後，この計画にもとづき，ナイジェリア，日本双方の研究者により論文が作成されることとなる。現段階で挙げられている論文題目リスト（暫定）を別紙に示す(P. 76)。

2. シンポジウムの開催

プロジェクト終了間際の時点で日本・ナイジェリア合同シンポジウムを開催し，上記研究論文のうち優秀なものを選んで発表し，プロジェクトの「総まとめ」とする提案を調査団より行い，ナイジェリア側の全面的賛同を得た（本提案については昭和60年8月20日付日本側国内委員会で「実施の方向で検討する」との方針が打ち出されている）。

同シンポジウムの開催要領についてのとりあえずの協議結果は以下の通りである。

(1) 時　期：1987年4月末～5月初

(2) 期　間：2日乃至3日

(3) 場　所：ジョス大

(4) 参加者：ジョス大及び日本側関係者

（ジョス大以外のナイジェリア研究者の参加も検討されよう）

なお，OJI 医学部長より本件につき速やかに実行委員会をジョス大内部に組織し（日本人専門家も参加），準備に入りたい旨の発言があった。日本側としても本プロジェクトの成功裡の開催にむけて，ナイジェリア側と連絡をとりつつ，早目に準備体制を整えることが必要である。

また，先方より87年の総まとめシンポジウムに先立ち，86年中にプレ・シンポジウムを開催したい旨の意志表示があった。しかしこの提案に対してはナイジェリアプロジェクト・メンバー間にも賛否両論があり必ずしも意見の一致をみていない。わが方よりは

① ナイジェリア側のイニシアチヴで独自に開催するのは自由である。

② 但し，現在の研究の進み具合からみて，来年中にまとまった成果を発表するのは時間的に無理があるのではないかと考える。

の2点についてコメントを付しておいた。

C. プロジェクト運営上の問題点

残された協力期間の活動を円滑ならしめるためには，いうまでもなく研究活動の一層の活性化が必要であるが，それと同時にマネジメント面の充実が必須である。

本調査団はかかる観点からジョス大学側に対し下記２点につき強く申し入れを行った。

1. 治安の維持

ジョス市内の治安は従来はかなり良好であった。しかし本年６月頃より武装強盗団の横行が見られるようになり，日本人専門家の安全が脅やかされるにいたった。その後，日本側の経費負担により警備員及び警備犬を配置したこともあり，現在はほぼ安全な状態に復している。しかし専門家の安全確保はナイジェリア側の果たすべき最も基本的責務のひとつであり，先方の責任ある対応が望まれる。

またジョス大内部においても各研究室からの研究用備品の盗難が頻発しており，一時は日本人専門家が家宅捜索を受けるといった事態も発生した（ただし本件家宅捜索事件はジョス大副学長が遺憾の意を表明し，一応落着している）。

かかる状況に鑑み調査団よりあらためて専門家の安全確保及び学内の警備対策強化について対策を講ずるよう，OJI 学部長に対し申し入れた。

これに対し同学部長より，遺憾の意の表明があり，かつ

① 本件は副学長レベルにまで上げられており大学側としてもベストをつくしている。

② 学内の警備については，内部の者の犯行（又は共犯）の可能性があり，学内関係者一人ひとりについてチェックを行っており現在その結果まちの状態である。

旨の応答があった。

しかし，専門家の安全確保については，ジョス大側の現在の財政事情（注，1985年11月１日より俸給15%カットが実施された由）にかんがみ，ジョス大からの効果的かつ速やかな対応を期待するのはむずかしいと考えられる。したがって，姿勢的であるが，今後ともひきつづき日本側で自衛策をとることもやむなしと思われる。

2. 機材の有効利用

この点についての高橋リーダーによる問題提起を以下に引用する。

1) ３回にわたる供与機材の受領により，基本的な研究機材は充足したものと考えられ，検査，研究上，大きな支障はなくなって来ている。また，停電も少くなり，且，大学に発電機の設置も行われ，断水も稀になったことから本 project 開設時より見ると格段の向上をみたものと思われる。

2) 上述のような事情の好転に伴って，また別の問題が生じつつある。その１つは設備機材の完備により関係外の他部門よりの借用，使用申入があることである。

3) 稀少元素分析についてはＡＡＳ，ＩＣＡ等設備され，生化学教室のDr. Ubomが責任者と

して使用，維持管理を行っているが，これに対し，動物学，化学病理教室よりのAASの使用申入がある。これらの他教室の技術者に対するAASの使用法は野田専門家が一応教育をしてあるが，何れもDr. Ubom程の基礎学識をもたず，全面的にAASの使用を認めることは危険である。従って，現在はDr. Ubomが在室時にのみDr. Ubomの監督下に使用することとしているが，これはまた自由に使用する希望をはばむものであり苦情が多い。

当国の習慣として手や身体を用いて作業することは下級の作業と考えられ，下位のものにやらせるということになるが，この考え方は精密な機械を研究的に扱う場合は無理である。

4) 微生物研究室に於ても機材の使用，借用の申入があり，一度承知すれば次には権利となって自由に無断使用することになる悩みがある。

5) 衛生昆虫研究室に於ても顕微鏡写真装置等の設置により，研究室の設備もととのって来ているが，これを自由に使用したいという希望が多い。然し監督者のいない場合，学生（大学院）等の自由な出入は当然紛失等のおそれがあり，日本側としては常時，研究室に勤務する研究員(Counter part)の指命を早くから要求しているがまだ適任者を得ていない。

尚本件については3週間程前に1名のマスターコース修了者を指定して来たが，同人は2年前より私がもっとも危険な人物と目していた者であり，適当でない旨返答をしてある。

OJI学部長以下ナイジェリア主要メンバーの出席した全体会議の席上，調査団より上記問題の存在を指摘し，プロジェクト運営委員会(Running Committee)の設立による「ルールの制定」「ルールの効果的適用」及び「問題が生じた場合の委員会による迅速な解決」について要望した。

この提案はナイジェリア側プロジェクト・メンバー間のさまざまな意見をよびおこし，その結果ナイジェリア側メンバー間の理解・意見の相違・対立が明らかとなった。最終的には，OJI学部長が議事を収拾し，

① 本件の解決には本来プロジェクトのSteering Committee が責任をもつべきである。今後，同Committeeの機能を強化する（学部長が裁定し，日本人専門家が渦中に差き込まれないようにする）。

② ナイジェリア側メンバー間の意見の対立については近く会合を開いて調整する。

の2点をもって結論とした。それに対し日本側より重ねて善処を要望した。

総　括

本プロジェクトは，昭和57年に日本とナイジェリア国との間に結ばれたR・Dに基いて，ジョス大医学部の研究開発に協力し，プラトー地区住民の保健衛生向上のため，昭和57年から5年契約で出発した。

今回の巡回指導調査団の目的は，プロジェクトが発足して3年後に，残り2年間をさらに継続すべきかどうかは，両国政府間で査察し決定すべきことがR・Dの第10条にうたってあるので，それを実施するためであった。しかし3年間でゼロから始まったfield 調査を含む研究の完成を望み得べくもないことは明らかで，残り2年間の継続は自明のこととし，あとは如何に，本プロジェクト研究を国際的水準まで引き上げ得るかを努力目標として，現地のsteering committeeのメンバーと討議し，種々の勧告を与えることとなった次第である。

そのため，団員各位は，限られた期間内に超人的なhard scheduleをこなし，従来までの実績をふまえて，連日問題を討議し，略々国内委員会でまとめてあった案に近い見透しに達し得たと信じる。その間に果された現地，高橋チーム・リーダーの御努力に厚く御礼申し上げたい。残り2年間といっても，実質的にはあと1年半研究をした上で，まとめに入らねばならないので，ナイジェリア側も真剣に討論に参加した。他方vice chancellor Onazi氏や，医学部長などからは，本プロジェクトの延長を要望する声も聞かれたが，結局計画通り62年6月に終了することを，双方で再確認し得た。

本プロジェクトの4つのテーマのうち，順調に進展しているのはTrace element 調査で，次いで小児下痢症であろう。今後の大きな進展が予想される。衛生昆虫分野もあと2年間で目標到達が期待できる。“期待うす”は，甲状腺腫の分野で，これはジョス大側の病理生化学主任イシシエ教授の人柄に帰せられるところが大きいが，今迄field 調査の面で協力していたCommunity Healthの責任者が印度に帰国したことや，日本側にも若干気配りに足りないところがあったことも否めない。今後有能な甲状腺腫の専門家を派遣して，もっと挺入れしたいと願っている。

実際のプロジェクト運営上の不安が本年6月頃から浮上してきた。それは，貴重な研究機器の盗難や日本人専門家の安全確保の問題である。ナイジェリア国の経済の悪化，公務員の賃金カットなどの影響が，ジョスのような田園都市にまで及んできたことを思わせる。後者については，多大の出費を伴う自衛手段を強いられ，前者についても，学部長以下の主要メンバーに善処方を強力に求めている。いづれにも，学部長Ojiや前学部長Ikemeの指導力で，出きる限りの敏速な対策のとられることを要求する。

一刻も早く，ナイジェリア国の内政・経済の安定化を望んで筆を擱きたい。（畠山　茂）

資　　料

ANNUAL REPORT" 1985

C O N T E N T S

UNIJOS-JICA TRACE ELEMENT STUDIES IN PLATEAU STATE, NIGERIA

U.P. Isichei, A. Banwo, S.C. Das, B. Adegoke and J. Egbuta.

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Jos metropolis and its environs lie within the tin-mining districts of Plateau State. Mining leads to pollution of the environment and as an occupation carries with it the risk of certain health hazards. Besides, the landscape of the district is hilly, rugged and open to assault by erosions. Such physical features and terrain have their own health implications as well and explain partly why endemic goitre is a problem in the area. So far hardly any work has been done to study the effect of such changes among the residents of the region especially in relation to variations in the levels of trace elements other than iodine as well as in relation to the health hazards arising from pollution by contaminants released from the local tin, lead and zinc mining industries. The aim of the on-going project in the Department of Clinical Chemical Pathology is to provide some data for the evaluation of the problem in Plateau State.

The work which began a few months ago has made some progress. About 34 blood samples collected from apparently normal subjects have been analysed for their content of several trace elements. Some results are available and others are being evaluated. The aim is to study the impact of age and sex on plasma trace element levels in order to establish the reference range for trace elements for the local population. This exercise is of course a sine qua non for our main project.

Since the main task before us is to study the effect of environmental metallic deposits, in man, the results of the

..../2.

preliminary survey done by other teams are being studied to enable the Department direct its activities to the areas considered clinically important. The trace element team is continuing its work in this direction.

The aspects of the project which are being studied are as follows:-

1. Plasma and Tissue Levels of Important Trace Elements and the Metallo-Carrier Proteins in Apparently Normal Subjects in Plateau State.
   - the determination of reference values which is a necessary pre-requisite for comparative studies, evaluates the impact of age, sex etc on plasma and tissue trace element levels.
   A. Banwo et al.

2. Plasma and Tissue Levels of Important Trace Elements and the Metallo-Carrier Proteins in Miners, other Inhabitants of the Mining Districts and Special Problem Areas (e.g. Kuru) of Plateau State. J. Egbuta et al.
   - this sub-project studies the occupational health hazard involved among the workers of the mining industry.

3. The Impact of Seasonal Changes on Plasma Trace Element Levels
   - this aspect of the work is considered necessary as there appears to be some indications from the preliminary studies done by other teams that enviromental levels of trace elements vary with seasonal changes. (M.Sc. Postgraduate Students).

4. Blood and urine lead and zinc determinations in the lead-zinc mining community of Zurak - a study which inquires into the clinical implications of the heavy metal mining industry.
   J. Egbuta et al.

..../3

5. Trace Element and Disease : (M.Phil/PhD postgraduate students in the Department)
   - the current interest in the Department is on diseases common in this environment e.g. endemic goitre, sickle cell disease, G.6.P.D deficiency, liver cirrhosis etc.

Constraints in executing the departmental trace element Project.

1. The procedure for plasma and tissue analysis for their trace element content is a tedious and long procedure. The group is allocated one day a week for the analysis of samples. This time is very inadequate and has delayed progress of the work considerably. *(The JICA-Team Leader, Dr. H. Takahashi, has been approached about the possibility of providing the Department cathode lamps and standard solutions in order to make our departmental equipment (a Pye-Unicam's Model) functional. This will greatly accelerate the work of the departmental team.

2. The kits for transferrin and caeruloplasmin determination are not locally available. JICA Team leader has been approached to see if these could be obtained from Japan.

Other Remarks

Interaction with other Departments in some project areas is vital so that blood trace element levels could be evaluated along with enviromental changes.

* For the project, it is vital to include the determination of tin and rubidium; the former because of possible pollution of the environment by contaminants from the tin mining industry, the latter because preliminary analysis of the Jos water and soil samples seem to indicate that the content of that element is relatively high. Cathode lamps and standard solutions for these two trace elements are not available at the moment and so should be included in the list of the laboratory materials to be provided by JICA.

REPORT FROM TRACE ELEMENT PROJECT 2: 1985

TITLE: TRACE ELEMENT DISTRIBUTION IN PLATEAU STATE AND ITS ENVIRONMENTAL SIGNIFICANCE, BY A.E. OGEZI, M.E. ADIUKU-BROWN AND M.I. OGUNBAJO (DEPARTMENT OF GEOLOGY AND MINING).

1. SUMMARY OF 1983/84 WORK

During this period, a large number of samples of minerals, stream sediments, surface and underground water from Jos Plateau and its environs, particularly areas of known mineral occurrences and mineral processing were analysed for major, minor and trace elements of economic and environmental significance, using the AAS, XRF, XRD, microscopes, and a micro-probe analyser.

Studies on the minerals included:

a) Identification of the crystal structure.

b) X-ray fluorescence and wet analysis for component elements.

c) An investigation of an efficient, cheap and convenient method of determining trace elements in simple sulphide minerals.

In the studies on sediments, emphasis was laid on establishing:

a) Which sediment fraction contained the highest concentration of trace elements.

b) Which acid is more effective for the leaching of sediment samples.

c) Which trace elements are contained in the sediment samples and their economic and environmental significance.

d) The relationships between trace element contents of the sediment samples, the water samples and the bed rock.

Also, surface and underground waters were analysed for trace elements.

Results from the on-going research revealed that:

a) The surface water samples contained low concentrations of some toxic elements, such as Cd, Pb and Zn.

b) Some minerals mined on Jos Plateau, for example, monazite, contains the radioactive elements, uranium and thorium.

In the course of the reconnaissance survey, oral discussion with the Director of one of the mining companies revealed that some residents of the area were already showing symptoms of effects of dangerous radiation levels e.g cancerous growths on the skin, pre-mature deliveries, etc.

2.

c) Well waters were generally lacking in toxic elements due to filtering action of acquifers and absence of contaminates.

d) The sediments also contained some toxic amounts of the trace elements, especially in areas polluted by mining activity.

e) The sediment fractions finer than 0.125 mm mesh size contained higher concentrations of trace elements due to adsorption and element mobility.

f) 50% Hcl was efficient for the leaching of sediment samples and quite cheap and safe to use for large number of samples treated.

g) Some of the minerals contain high amounts of the much needed alloying elements, for the steel company. These elements include, Zr, Nb, Ta, Hf and they were found in the minerals, columbite and zircon, etc contained in mine/mineral processing dumps and in tin smelting slags.

h) Some of the sulphides analysed contained economic amounts of Cd and Ag, which if exploited would make the mining of the sulphides more feasible. Others have major Health implications.

i) A simple dilute HNO_3 digestion was found to be efficient and convenient for the wet digestion of simple sulphides and this was cheaper, safe and easier to use for the large number of samples that would be treated during this project.

2. SUMMARY OF WORK IN 1984/85 SESSION

During this period, emphasis was placed on studies of the effects of mining in Zurak and checking the results and the significance of the work carried out in 1983/84.

Mineral and Water samples were collected from some wells and ponds in the abandoned mining area of Zurak, S.E. Plateau where Pb-Zn mining took place up till just before World War II. Plant leaves were also collected from the neighbourhood of the ponds. The samples have been analysed for the following trace element: Pb, Cd, Zn, Mn, Ag, Cu, Co, Ni, Cr, etc by Atomic Absorption spectrophotometry (AAS) in the Department and the Nigerian Mining Corporation, Jos. The samples were also analysed for the anions SO_4^{2-} PO_4^{2-}, NO_2^-, Cl^-, F^-, etc., using the ion exchange chromatographic analyser provided to the Department of Biochemistry, by JICA. The heavy and trace elements were analysed using the AAS of the Department of Geology and Mining.

3.

Occesionally, the samples were analysed using the AAS provided by JICA, for comparative purposes. The results often compared favourably.

Results from the research revealed that Pb, Cd, and Zn are present in the pond water, which is acidic, at concentrations above World Health Organizations (WHO) permissible limits. There was no major biota in the water. Analysis of fresh leaves from the environment revealed that there is a high concentration of Cd, Zn, and Pb, reflecting the extent to which the soil and underlying bedrock is rich in these metals.

Results of cation analysis of some sphalerite and mine dump dust samples around the ponds show a high concentration of Pb, Zn, and Cd. These toxic elements were probably leached into the water from the surrounding mining wastes and the surrounding mineralised sedimentary rocks.

Anion concentrations were relatively high, especially the SO_4^{2-}. The well water in Zurak village, far from the mineralised zone, had non-detectable amounts of toxic trace elements.

The situation in Zurak calls for an inter-disciplinary research. These metals, when present in toxic concentrations in human beings, form particularly stable bonds to the active sites of some enzymes and this chemical affinity is the basis of metal toxicity in man. The attachment to an enzyme of these metals impairs the normal metabolic role of the enzyme. Thus, the high affinity of Pb^{2+} for thiol and phosphate-containing ligands in living systems inhibits the biosynthesis of heme, affecting membrance permeability of the kidney, liver, and brain cells, thereby, causing their damage, leading eventually to convulsions, behavioral disorders and death. Excess Cd causes high blood pressure and interferes with zinc metabolism.

The residents of Zurak, who are presently drinking water from these ponds, may soon be experiencing these problems, if they are not doing so already. Adequate planning is very necessary in order to establish realistic criteria and standards to protect

4.

Public Health and water quality in the area.

The significance of the identification of several minerals and elements in mine dump and slag will be investigated in 1985/86.

3. 1985 - 86 RESEARCH PROPOSAL

In the 1985/86 year, more minerals, rocks, sediments and water samples will be analysed from both the Jos and Zurak areas. Chemical Studies of the minerals will also be intensified and detailed mineralogical, X-ray diffraction and radiometric studies carried out, Geological and geochemical studies of element mobility, solid waste disposal and their health effects in parts of Plateau State would also be intensified.

Subject to the availability of equipment and materials, at least three publications are expected at the end of the period.

4. EQUIPMENT RECEIVED SO FAR FROM JICA: THEIR UTILIZATION AND PRESENT STATE.

The following major equipment have so far been received from JICA, with gratitude:

i) General Laboratory wares already received, such as mortars, pipettes, volumetric flasks, measuring cylinders, beakers, etc are all being effectively utilised. Replenishment has been requested for in 1985/86.

ii) The analytical balance is yet to be properly installed, but efforts have been made by the Department and JICA to get all the parts from Japan.

iii) The quality of water from the deionizer is presently being tested in order to ascertain how efficiently deionized the water is. This equipment needs a transformer to be properly functional.

iv) It has been difficult to put the water quality checker to use. It does not seem to be conducting and contacts are being made to make it functional.

v) The transformer attached to the grinder and the p^H meter has not be located and is being searched for.

vi) The tripod stand was supplied without the clamps.

vii) The support for the Kjedahl apparatus was not also supplied.

5.

5. PROBLEMS AND PROSPECTS

The absence of analytical balance and a fume cupboard have caused a great deal of set-back to the project. We have had to go as far as the Nigerian Mining Corporation (NMC), Jos, to be able to digest our samples.

The X R F and Microscopic studies were done in France and Germany, respectively. We acknowledge assistance of equipment received from JICA and other projects, such as V W Foundation (through A.C. Ogezi) etc and access to Universities in France, the Federal Republic of Germany and Great Britain. We also thank the Nigerian Mining Corporation, Jos, and other Departments and colleagues of the University of Jos, especially Zoology, Biochemistry and Chemistry for support and access to equipment.

We have requested for a number of new equipment for radiometric, petrographic, mineralogical, and chemical analysis and replenishment or new supplies of chemicals and reagents. We hope to continue with increased vigour during the 1985/86 session, subject to the availability of materials, equipment and time.

With the current level of support by JICA, the group hopes to make several very significant findings with important health, environmental and economic implications. We sincerly acknowledge assistance of JICA and its scientists, especially Dr. H. Takahashi, in these investigations.

UNIJOS/JICA TRACE ELEMENT STUDIES

Sub Project 3: RESEARCH PROJECT ON TRACE ELEMENTS BASED IN ZOOLOGY DEPARTMENT, FACULTY OF NATURAL SCIENCES, UNIVERSITY OF JOS, JOS

The distribution of trace elements in surface water and streams sediments in the Jos plateau in relation to their concentration in tissues of aquatic organisms.

Research Plan for 1985/86

1. Evaluation of trace element levels in water, sediments and tissues of aquatic organism in two mine lakes in Jos area for the second full year.
2. Trace element levels in water sediment and macroinvertebrates in two artificial impoundments and their relationship with the geological formation and reservoir age.
3. Comparative Evaluation of the varying levels of trace-elements in plankton through macro-inetebrates to fish in surface waters located in (a) mining and non-mining districts of Jos plateau. This work will attempt a synthesis of the biological significance of the results obtained in the past two years on the main project.
4. Trace element concentrations in vegetable matter (relevant to human nutrition) and produced through dry season irrigation with water polluted with heavy metals in Jos area.
5. Studies on the physiological activities of selected trace elements at levels observed in waters used by man in the Jos plateau - cadmuim, lead, zinc, manganese and organic tin.

EXPECTED PUBLICATIONS BY THE TRACE ELEMENT PROJECT SUB-PROJECT 3 BASED IN ZOOLOGY DEPARTMENT ON COMPLETED STUDIES

1. Distribution of Trace Elements in some surface waters by Ejike C, D. Anadu, I.J. Chidobem and E.C. Nkemdirim.
2. Trade Element Levels in the water and sediment in Two Old Mine Ponds and their Relation to Pond Primary Productivity by Ejike C, J.W. Wade, D. Anadu and I.K. Chidobem.
3. Seasonal Variations in Trace Elements Contents of Water, Sediments and Macroinvestebrates in Two Reservoirs in the Jos Plateau by
4. Studies on the Impart of Water quality Characteristics, Gradient and Water Velocity on Survival and Larval Transition in *Simulium* by Ejike C., Makpo J.K. and Okayi R.C.

SUMMARY OF BIOCHEMISTRY DEPARTMENT TRACE ELEMENT SUB - PROJECT DATA FOR THE YEAR 1984 - 1985 AND RESEARCH PROPOSAL FOR THE PERIOD 1985/1986

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Our report is a summary of work undertaken (some completed and others to be completed) for the year 1984/1985 and a projection into what we intend to pursue in the year 1985/1986 under the JICA - UNIJOS supported project.

Completed works include:

(i) Water quality survey in Jos metropolis and its surburbs.
The water quality surveys involve cation and anion concentration determinations in treated (tap) and untreated (well, stream, dump and industrial effluent) waters.

(ii) Comparative studies on water and food chemical components from areas already identified as goitrous with those from non-goitrous areas.

(iii) Chemical composition seasonal fluctuations in water and foods from Jos and its surburbs.

(iv) New technique for determining micro-amounts of halogens present in foods. This technique requires the bomb (oxygen) combustion of partly dried foods to destroy organic components and the dissolution of emitted gases in hydrogen peroxide. The resultant liquid is then subjected to ion chromatographic analyzer (ICA) treatment.

The completed works have required a combination of several chemical and physical techniques (extractions, digestions, atomic absorption spectrometry, chromatographic separations) to effect. These completed works are being written up for publication with Ubom and Noda as the principal authors. Dr. Tsuchiya and Dr. Sasano, the short term experts, who have been very instrumental to the success of our work through advises and personal involvements will be dully acknowledged.

Our research plan/s for the year 1985 - 1986 will come under the following general guidelines:

1. Monitoring the organic components of health significance in water and foods. Our interests involve the determinations of concentrations of benzene, chlorinated alkanes and alkenes, chlorophenols, polynuclear aromatic hydrocarobons, trihalomathanes and pesticides in our waters and foods. These organic compounds are precursors to carcinogens or are carcinogens themselves and should be detected and controlled even when they occur in micro amounts in our environment. This aspect of the work will be actively pursued once we have a gas chromatograph (GC).

2. The impact of human activity on drinking water will be studied using variables like ammonia, nitrate, nitrite, silicate, turbidity, colour and surfactants (MBAS) contents as indicators.

3. The uptake and concentration patterns of trace and heavy metals from the soil and water through crops and vegetables to humans will be studied. This has become rather important as industrial effluents are being used for irrigation in most of Plateau State during the dry season.

4. Comparative studies of chemical composition of water and foods from several identified areas with typical diseases to establish common chemical difficiences or excesses that potentiate these diseases.

5. Collaborative work between our group and microbiology department will be carried out in an attempt to establish any relationship/s, if any, between cation and anion concentrations in water and the prevalence of bacteria therein.

6. Some collaborative work will also be carried out between our department and the department of Community Health. The prosposed work will entail surveys of disinfected and non-disinfected drinking waters: relationship between these and diarrhoeal incidences.

7. The determination of total organic carbon in drinking water before and after disinfection as a means of monitoring the concentration of chlorinated organic compound that result from disinfection. This phase of work will require the use of the total organic carbon determination equipment which we do not presently have and would request that we be supplied with one.

OUR EQUIPMENT NEEDS FOR 1985 - 1986

1. TOTAL ORGANIC CARBON DETERMINATION EQUIPMENT

2. GENERATOR FOR IO_4, FLAME PORTION OF AAS DISTILLER

3. REPLACEMENT PARTS FOR AAS

   (a) CURVETTES (CUP AND HOLE TYPES) 200 EACH,

   (b) HOLLOW LAMPS (Ca, Mg, K, Sn, Pb, Mn, Cd, Ni, Zn, Fe, Cu, Li, Cr, Co,)

c. STANDARDS FOR Ca, Mg, K, Sn, Pb, Mn, Cu, Na, Zn Fe, Cd, Li, Cr, Co.

d. AAS ASPIRATOR TUBES

4. REPLACEMENT PARTS FOR ICA

(a) COLUMNS FOR CATION AND ANION SEPARATIONS (6 each).

(b) Millipore Filters

(c) SAMPLING BOTTLES 100ml, 200ml (100 each).

5. Hg and As determination equipments

ENDEMIC GOITRE RESEARCH PROJECT IN PLATEAU STATE, NIGERIA (PHASE 2 REPORT)

Prof. U.P. Isichei, Dr. S.C. Das, A.I. Banwo and J. Egbuta.

Department of Clinical Chemical Pathology, Faculty of Medical Sciences, University of Jos, NIGERIA.

The results of work done in Phase I was presented in a previous report. What follows is a description of the work done by the Department of Clinical Chemical Pathology in Phase 2, the current phase of the project. In Phase I, the emphasis of the work done in the project was on epidemiological survey. At the end of Phase I, one of the Principal Investigators, Prof. I.C. Tiwari, the Head of Community Health Department resigned his appointment and withdrew from the project. In the current phase, the emphasis of the work is on the clinical pathology of the disease as well as work directed at determining some of the aetiological factors involved in goitre in Plateau State. Epidemiological survey however continues but this time was extended to include the adults within the general community. The work done in the current phase was executed by members of the Chemical Pathology Department under the supervision and direction of Prof. U.P. Isichei assisted by Dr. S.C. Das. The details of the work done are as follows:-

1. About 300 samples of blood were collected and subjected to analysis for the determination of the following thyroid function parameters using the enzyme-linked immunoassay technique : thyroxine (T_4), triiodothyronine (T_3), thyroid stimulating hormone (TSH), thyroxine-binding globulin (TBG), thyroxine binding capacity (TBC), and the free thyroxine index (F.T.I.). The samples analysed included both normal and pathological.

..../2.

2. Several samples were collected from apparently normal subjects to study the impact of age and sex on the above parameters. Reference values were derived by subjecting the results to statistical analysis to obtain the mean and range values.

3. Pathological samples from patients with endemic goitre (grades 1 - 4) were collected and processed to determine the functional status of the thyroid gland in relation to plasma thyroid hormone levels, thyroid stimulation, the content of thyroxine binding globulin, the capacity of hormone binding and the free-thyroxine index. The work is continuing.

4. A comprehensive study of plasma lipid profiles among the goitrous population which began in this phase is still going on. The parameters currently being determined include the following : Total cholesterol, beta lipoprotein cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides and the lipoproteins.

5. Similarly a differential study of the protein constituents of plasma in endemic goitre has started. So far this work has been restricted to the determination of total serum protein and the albumin/globulin components due to the limited facilities. It will be extended to include the evaluation of thyroid and lipid associated specific carrier proteins in relation to thyroxine and cholesterol metabolism as soon as facilities become available.

6. Several water samples as well as soil samples were collected from the endemic and non-endemic zones for physico-chemical

..../3.

analysis to determine some of the possible aetiological factors responsible for endemic goitre in Plateau State. Some of these have already been analysed and the rest will follow as soon as possible.

7. The endemic goitre survey was intensified and extended to include the adult population within the general community. A total number of 1004 subjects were examined in the present phase of the project. Two areas with different geological formation were selected for mass-screening of subjects -- Binci (granite formation) and Miango (basalt lava). A few patients referred to us in the hospital were included in the survey.

8. Questionaires have been designed and are used during the survey to gather vital information in relation to clinical observations (e.g. cretinism, hypothyroidism, deaf mutism, type of staple diet, water and vegetable sources etc). Several cases with monstrous goitres and some cases of cretinism were identified and photographed.

9. A family from Barkin Ladi with 6 children, four of whom are cretins was investigated and currently being studied. The patients were discovered, clinically examined and evaluated during the course of our survey in our Department. The family is being presented jointly by the Departments of Clinical Chemical Pathology and Internal Medicine as case report.

AETIOLOGICAL STUDIES OF INFANTILE DIARRHOEA DISEASES SEEN IN JOS UNIVERSITY TEACHING HOSPITAL, JOS NIGERIA
A Preliminary Report*

Ani, Agatha,[1] Takahashi, M.,[2] Saida, H.,[2] Kozak, W.H.,[1] Kumar, V.,[1] Shonekan, R.A.O.[1] and Agbonlahor, D.E.[3]

[1] Department of Medical Microbiology, University of Jos
[2] Japanese International Co-operation Agency
[3] National Veterinary Research Institute, Vom

ABSTRACT

A total of 589 children, 5 years and below, presenting with diarrhoea at Jos University Teaching Hospital were investigated for bacterial enteropathogens from October 1983 to September 1984. 262 of these were examined for Campylobacter jejuni (C. jejuni) while 144 were examined for Rota virus.

The prevalent rate of C. jejuni was 8.8%; others are as follows: Shigella spp (8.5%); Enteropathogenic E. coli (EPEC) (6.1%); Salmonella spp (2.9%); Stapylococcus aureus (1.5%); Aeromonas hydrophila (0.8%); Klebsiella oxytoca (0.7%) and non-01 Vibrio cholerae (0.5%). One strain of EPEC was found to produce heat-labile enterotoxin (LT). No Yersinia enterocolitica has so far been isolated. 3.5% of the number examined for Rota virus was positive. The results are discussed according to age of children and seasons of the year.

ISOLATION OF CAMPYLOBACTER JEJUNI IN JOS, NIGERIA.

ANI, TAKAHASHI M, TAKAHASHI T, KOZAK W, KUMAR V, AND SHONEKAN RAO

Campylobacter jejuni was isolated from 8.1% of 667 stool samples from children with diarrhoea and 0.5% of 180 samples from apparently healthy children, during 1 year (May 1984 - April 1985) survey in Jos, Nigeria The equivalent figures for other bacterial enteric pathogens isolated were Shigella spp 8.7%; Enterpathogenic Escherichia coli (EPEC) 8.0% Salmonella spp 8.3%; 1.3% Aeromonas hydrophila (A. hydrophila) 1.3% and non O-1 agglutinable Vibrio cholerae (NAG. V. Cholerae) 0.6%.

From results obtained in this study, the differences in the prevalence of C. jejuni from diarrhoeal children, when compared with those of shigella and EPEC are not statistically significant. The prevalences of Salmonella, A. hydrophila and NAG V. cholerae in the children are however, relatively low, compared to that of C. jejuni.

Drug Susceptibility Tests and Minimum Inhibitory Concentrations of 88 Strains of Bacterial Enteric Pathogens

13th August, 1985

A. Ani *et al.*

Summary

A total of 88 strains of enteropathogenic bacteria isolated from cases of infantile diarrhoea seen at Jos University Teaching Hospital was subjected to drug susceptibility test and minimum inhibitory concentrations (MIC). Among these isolates were 43 strains of Shigella, 30 strains of enteropathogenic Escherichia coli and 12 strains of Salmonella. They were all tested against 8 different types of antimicrobial agents, Viz: Nalidixic acid (NA), Streptomycin (SM), Kanamycin (KM), Cephalexin (CEX), Ampicilin (PN), Chloramphenicol (CM), Tetracyclin (TE) and Sulphonamide (S3).

The percentage resistance to the drugs exhibited by the different bacteria were as follows. Salmonella species: S3=100%, TE=16.7%, PN=16.7%, KM=16.7%, SM=16.7% and CM=8.3%. All strains were sencitive to NA and CEX. Shigella species: S3=90.7%, TE=81.4%, PN=60.5%, KM=4.7%, SM=72.1% and CM=65.1%. All strains were sinsitive to NA and CEX. Enteropathogenic Escherichia coli: S3=83.3%, TE=66.7%, PN=50.0%, KM=23.3%, SM=56.7% and CM=40.0%. All strains were sensitive to NA and CEX.

Generally, all the bacterial isolates exhibited high resistance rates to S3. Shigella species were highly resistant to S3, TE and SM, and also to CM and PN. Enteropathogenic Escherichia coli strains were highly resistant to S3,TE, PN and SM. All 88 strains tested were however sensitive to NA and CEX.

Viral, Bacterial and Parasitic Enteric Pathogens Associated with Diarrhoea Children

4th October 1985
M. TAKAHASHI *et al*

Summary

A total of 641 diarrhoeal children, under 5 years and below, were investigated for Viral, Bacterial and Parasitic enteric pathogens at Jos University Teaching Hospital from July 1984 to June 1985.

As Viral enteric pathogens, only Rotavirus was studied. Stool samples were collected from three different sections namely Paediatrics Ward (Paed.), Out Patient Department (O.P.D.) and Child Health Clinic (C.H.C.). Infection rate of Rotavirus was high at Paed. (14.8%) comparing with at O.P.D. (5.7%) and C.H.C. (2.5%). As an avelage, 7.0% of Rotavirus infection cases were found from diarrhoea children. There was no significant difference on the infection rate of Rotavirus with sex; male (6.7%) and female (7.4%).

Rotavirus was found mostly from age group under 2 years. The infection rates among various age groups were as follows; 9.4% (under 6 month), 10.6% (6-11 month), 5.0% (12-17 month), 6.5% (18-23 month) and 2.2% (24 month and above).

There was high peak of incidence of Rotavirus (28.6%) in November, and also the infection rate was higher in Dry season (12.9%)(Nov. - Mar.) than in Rainy season (4.2%)(Apr. - Oct.).

There were 5 multiple infection cases with Rotavirus. They were Rotavirus and Enteropathogenic Escherichia coli (EPEC)(3 cases), Rotavirus and Campylobacter jejuni (1 case), and Rotavirus and Entamoeba coli (1 case).

Infection rates of enteropathogenic bacteria at Paed., O.P.D. and C.H.C. were 23.5%, 22.3% and 17.5% respectively. As an avelage, it was 21.4% (137/641). Shigella, Enteropathogenic Escherichia coli (EPEC) and Campylobacter jejuni were most commonly isolated organisms, and their infection rates were 7.3%, 7.2% and 6.9% respectivery. Salmonella and Vibrio were isolated only 2.7% and 0.5% from the patients. All of Vibrio strains isolated were Non O-1 Vibrio cholerae (NAG Vibrio). No Yersinia enterocolitica was isolated.

Though diarrhoea cases with enteropathogenic bacteria were seen in all age groups, there was no significant difference on the infection rate among age groups. There was also no difference on the infection rate between Dry season (22.0%) and Rainy season (21.1%). Among Shigella strains, Shigella flexneri was the most frequently isolated strain (61.7%). 18 different kinds of serotypes of EPEC were found, and among Salmonella strains, B group strain was highly isolated (9/17). There were 17 multiple infection cases of enteropathogenic bacteria. Among them, 3 cases were triple infection cases, others were double infection cases.

610 out of 641 diarrhoeal children were examined for parasites. Infection rate of parasites was 10.2% (62/610) as an avelage. It was high at O.P.D (13.6%) and at Paed. (10.3%), and low at C.H.C. (2.7%). 12 different kinds of parasites were found. Infection rates of Entamoeba histolytica and Giardia lamblia were 1.5% and 2.1% respectively. According to age growing, the infection rates of parasites were increased; 0-1 year (3.1%), 1-2 years (9.6%), 2-3 years (22.2%), 3-4 years (28.1%) and 4-5 years (41.4%). 9 multiple infection cases of parasites were found, and 13 multiple infection cases with enteropathogenic bacteria and parasites were also found.

Enteropathogenic Bacteria and Parasites Associated with Diarrhoea Children

3rd October 1985

M. TAKAHASHI *et al*

Summary

A total of 1,137 children, 5 years and below, presenting with diarrhoea at Jos University Teaching Hospital were investigated for bacterial and parasitic enteropathogens from October 1983 to June 1985.

829 of these were examined for Campylobacter jejuni (C. jejuni), and 989 of these for parasites. 525 stool samples were collected from Out Patient Department (O.P.D.), 220 stool samples from Paediatrics Ward (Paed.) and 392 stool samples from Child Health Clinic (C.H.C.).

Infection rates of enteropathogenic bacteria were 24.2% at O.P.D., 24.1% at Paed. and 16.6% at C.H.C. Shigella (8.4%), C. jejuni (7.1%) and Enteropathogenic Escherichia coli (EPEC)(6.9%) were most frequently isolated bacteria. Isolation rates of Salmonella and Vibrio were 2.9% and 0.4% respectively. All of the strains of Vibrio were Non O-1 Vibrio cholerae (NAG Vibrio). No Yersinia enterocolitica was isolated.

In age group from 4 years to 5 years, the infection rate of enteropathogenic bacteria was the highest (38.8%). The lowest infection rate was in age group under 1 year.

Seasonal incidence of enteropathogenic bacteria was studied from November 1983 to March 1985. Infection rate was slightly higher in Rainy season (April to October)(18.3%) than in Dry season (November to March) (13.6%, 14.9%).

Among Shigella strains isolated, Shigella flexneri was the most frequently isolated strain (64.2%). 23 multiple infection cases of enteropathogenic bacteria were found. Among them, mixed infection with Shigella and C. jejuni

was frequently found.

For drug susceptibility test, 11 different kind of anti-biotic drug disks were used. They were Ampicillin (ABPC)(25ug), Colistin Sulphate (CT)(10ug), Nalidixic Acid (NA)(30ug), Nitrofrantoin (F)(200ug), Compound Sulphonamide (Su)(300ug), Streptomycin (SM)(25ug), Tetracycline (TC)(50ug), Co-Trimoxazole (SxT)(25ug), Chloramphenicol (CM)(30ug), Kanamycin (KM)(30ug), Erythromycin (EM)(10ug). 80 of Shigella strains were tested, and showed high registant to ABPC (63.8%), Su (71.3%), TC (56.3%) and SM (55.0%). Compound Sulphonamide (Su) had the highest resistant rate with Salmonella strains. EPEC strains also showed high resistant to Su (93.2%), TC (68.5%) and SM (57.5%). Drug resistant rates of EM and NA with C. jejuni were 2.4% and 7.3% respectively. There was no resistant strains against KM and CM among C. jejuni strains.

Infection rates of parasites was 9.4% (93/989) in age group 0 - 5 years old. 14 various kind of parasites were found. According to age growing, the infection rate was increased; 0 - 1 (2.6%), 1 - 2 (8.7%), 2 - 3 (21.6%), 3 - 4 (28.3%) and 4 - 5 (40.0%). Entamoeba histolytica and Giardia lamblia were found only in 1.3% (13/989) and 1.7% of diarrhoea children respectively. 14 multiple infection cases of parasites and 24 multiple infection cases with enteropathogenic bacteria and parasites were found.

Survey on Bacterial and Viral Enteric Pathogens Associated with Diarrhoea in Four Primary Schools in Jos

5th October 1965
M. TAKAHASHI et al

Summary

A total of 619 primary school children were investigated for Bacterial and Viral enteric pathogens, and also studied relationship with pathogens and drinking water and toilet. For this survey four primary schools were chosen nasely Gangare primary school (P.S.), Ekan P.S., Jenta P.S. and Tudun-Wada P.S. Among a total of 619 school children, 99 of them (16.0%) had diarrhoea within 3 days only, 33 of them (5.3%) had within 3 days and 3 weeks, 24 of them (3.9%) had within 3 weeks but not within 3 days. In total, 156 children (25.2%) had diarrhoea within 3 weeks. In Gangare P.S., 26.7% of children had diarrhoea, in Ekan P.S. 20.5%, in Jenta P.S. 25.8%, in Tudun-Wada P.S. 26.4% respectively.

Among those comprained with diarrhoea within 3 weeks, 108 of them (69.2%) were treated with drug for it. Among 108 treated children, 12 of them (11.1%) still had enteropathogenic bacteria while 3 (6.3%) of 48 non treated children had enteropathogenic bacteria. At home, many children drink Tap water only (62.2%), some drink Tap and Well water (25.8%), and a few drinks wll water only (12.0%). There was no significant difference on the infection rate of enteropathogenic bacteria among children who drink Tap and/or Well water. As a type of toilet at home, Pit latrine was very common (81.3%), and Water closet was used only in 17.9%. Again there was no significant difference on the infection rate among children who use Pit latrine and Water closet.

Infection rate of enteropathogenic bacteria at Tudun-Wada P.S. was lower (7.4%) than at other schools; Gangare P.S.

(13.3%), Ekan P.S. (13.7%) and Jenta P.S. (15.3%). Among non diarrhoea children in four schools, 13.2% of them had enteropathogenic bacteria while among children who had diarrhoea within 3 weeks, 9.6% of them had it. From four school children, as an enteropathogenic bacteria, enteropathogenic Escherichia coli (5.7%), Campylobacter jejuni (5.7%), Shigella (0.6%), Salmonella (0.6%) and Yersinia enterocolitica (0.2%) were isolated. No Vibrio strain was isolated.

The infection rates of enteropathogenic bacteria among various age groups in four schools were as follows; 15.8% (4-6 years), 13.6% (7-9 years), 10.1% (10-12 years) and 11.8% (13-15 years).

309 children from Gangare P.S., Ekan P.S. and Jenta P.S. were examined for Rotavirus, and no Rotavirus was found.

Preliminary parasitological survey in the Jos Plateau, Nigeria

Kuninori Shiwaku[1], Hiroshi Takahashi[2], Bertram E. B. Nwoke[3], C. O. E. Onwuliri[3] and God O. Ufomadu[4]

Abstract: A survey on schistosomiasis, intestinal perasitic infections and filariasis was performed at three villages in the Jos Plateau, Nigeria, during from February to March 1985. Of 668 fecal samples, 66.8% was found to harbour parasites. The overall prevalence of people with respective parasites were followed: hookworm, 40.3%; Ascaris lumbricoides, 9.1%; Strongyloides stercoralis, 0.3%; Trichuris trichiura, 0.4%; Schistosoma mansoni, 18.9%; Taenia sp., 0.1%, Hymenolepis nana, 0.1%; and cysts of Entamoeba histolytica, 6.7%; Entamoeba coli, 31.4%; Iodamoeba bütschlii, 11.1%; Endolimax nana, 2.5%; Chilomastix mesnili, 1.6%; Giardia lamblia, 1.5%. Hookworm was the predominant helminth, and the infected larvae of N. americanus identified in six pupils examined using filter paper-cultures. The recorded rates from three population samples varied in prevalence of hookworm infection significantly, 53.9% at Sop, 33.3% at Jebu and 6.0% at Maigemu. It seems that the difference in prevalence of hookworm among three villages are due to difference of humidity in soil in a dry season. Out of 344 inhabitants, 5.2% and 13.4% were found to harbour microfilariae of L. loa and D. perstans at present study villages respectively.

JICA - UNIJOS RESEARCH PROJECT ON DIARRHOEA IN CHILDREN UNDER FIVE YEARS OLD

RESEARCHER: OKORONKWO, M.O., TAKAHASHI, T, TAKAHASHI, M, AND NWENE U.P,

DEPARTMENT OF COMMUNITY HEALTH

ANNUAL REPORT JULY 1984-JUNE 1985

This represents a summary of data collected in one year on clinical presentation, environmental, socio-demographic and epidemiological profile, obtained from children attending different Units of the Jos University Teaching Hospital (JUTH). Samples of stool were collected and examined at the JICA/University of Jos Microbiology Laboratory. A total of 1,178 diarrhoea cases was recorded in the various hospital units, but epidemiological data is available for only 942 cases, and out of these, six forms did not contain epidemiological information. Hence, only 936 cases have been analysed.

Chromosomes of Onchocerca volvulus from Nigeria.*

H. Hirai,[1] I. Tada,[1] H. Takahashi,[2] B.E.B. Nwoke,[3] and G.O. Ufomadu[4]

Onchocerca volvulus (Spirurida:Onchocercidae) is the parasite which cause river blindness in Africa, which distribute mainly in the East and West Equatorial Africa and Central and South Americas. It has been said that there are differences in the clinical manifestations between African and American onchocerciasis (Browne 1961; Woodruff et al. 1966; Oomen 1969; Tada et al. 1974). Further, the vector blackflies - the parasite complex in individual endemic areas is distinct to each other (De Leon and Duke 1966; Duke et al. 1967; Omar and Garms 1975; Garms and Ochoa 1979; Garms 1983). However, no distinctive morphological differences have ever been found in the parasite between America and Africa (Sandground - 1934; Franz 1980). Therefore, it is very important to clarify the genetic nature of both African and Mesoamerican O. volvulus. This paper deals with the chromosomes of Nigerian parasite and the comparison between African and Mesoamirican (discribed in a previous paper, Hirai et al. 1985) strains, to each other.

A BIOMETRIC STUDY OF ONCHOCERCA VOLVULUS MICROFILARIAE FROM NIGERIA BY THE NUCLEAR COUNTING METHOD.

T. MIMORI , I. TADA , K. SHIWAKU , G. O. UFOMADU and B. E. B. NWOKE

Abstract. By using the nuclear counting method, we counted the nuclei in the cephalic space and nerve ring (CS-NR) region of Onchocerca volvulus microfilariae from Nigeria. The mean nuclear number was 88.01. There was no statistically significant difference in the nuclear numbers of O. volvulus microfilariae between Nigeria (present rersult) and Guatemala (87.73, from our previous data).

UNIJOS-JICA TRACE ELEMENT STUDIES IN PLATEAU STATE

Department of Clinical Chemical Pathology Programme

Main Project Title : Plasma and Tissue Levels of Important Trace Elements and the Metallo-Carrier Proteins Among the Inhabitants of the Mining Districts of Plateau State (Isichei et al)

Research Plan for 1985/86

1. Plasma and Tissue Levels of Important Trace Elements and the Metallo-Carrier Proteins in Apparently Normal Subjects in Plateau State.
   - the determination of reference values which is a necessary pre-requisite for comparative studies, evaluates the impact of age, sex etc on plasma and tissue trace element levels.
2. Plasma and Tissue Levels of Important Trace Elements and the Metallo-Carrier Proteins in Miners, other Inhabitants of the Mining Districts and Special Problem Areas (e.g. Kuru) of Plateau State.
   - this sub-project studies the occupational health hazard involved among the workers of the mining industry.
3. The Impact of Seasonal Changes on Plasma Trace Element Levels
   - this aspect of the work is considered necessary as there appears to be some indications from the preliminary studies done by other teams that environmental levels of trace elements vary with seasonal changes.
4. Blood and urine lead and zinc determinations in the lead-zinc mining community of Zurak - a study of the clinical implications of the heavy metal mining industry.
5. Trace Element and Disease (this part of the programme which is a long term project will continue after the JICA programme ends). The Department intends to develop a centre of Trace Element studies in the Disease. - the clinical chemistry of trace elements is gaining a prominent place as an indicator of deficiency syndromes and toxicity states. For example, the discovery that deficiencies of specific trace elements such as copper and zinc may be involved in the pathogenesis of some

diseases hitherto regarded as idiopathic has generated much interest and lead to enquiries in other directions. The current interest in the Department is on diseases common in this environment e.g. *endemic goitre, sickle cell disease, G-6-P.D. deficiency, liver cirrhosis etc.

Remarks

1. The procedure for plasma and tissue analysis for their trace element content is a tedious and long procedure. The group is allocated one day a week for the analysis of samples. This time is very inadequate and has delayed progress of the work considerably. (The JICA-Team Leader, Dr. H. Takahashi, has been approached about the possibility of providing the Department cathode lamps and standard solutions in order to make our departmental equipment (a Philip's Model) functional. This will greatly accelerate the work of the departmental team.

2. The kits for transferrin and caeruloplasmin determination are not locally available. JICA Team leader has been approached to see if these could be obtained from Japan.

3. Interaction with other Departments in some project areas is vital so that blood trace element levels could be evaluated along with environmental changes.

P.S. * a sub-project within the Faculty-JICA endemic goitre project which attempts to elucidate some of the aetiological factors involved in the pathogenesis of endemic goitre in Plateau State.

DEPARTMENT OF CLINICAL CHEMICAL PATHOLOGY
FACULTY OF MEDICAL SCIENCES
UNIVERSITY OF JOS

From: Prof. U.P. Isichei
Head, Department of
Clinical Chemical Pathology
& Principal Investigator,
Endemic Goitre Project.

To: The Dean
Faculty of Medical
Sciences.

Dr. H. Takahashi,
Team Leader, JICA

14th October, 1985

UNIJOS - JICA ENDEMIC GOITRE SURVEY IN PLATEAU STATE (NIGERIA)

Main Project Title: ENDEMIC GOITRE STUDIES IN PLATEAU STATE, NIGERIA (Isichei et al)

Research Plan for 1985/86

Sub-Projects:

1. The Biochemistry and Clinical Features of Endemic Goitre in Plateau State, Nigeria

- this part of the work examines some of the possible aetzologica factors retated to endemic goitre in the region and studies the hormonal changes occurring in the patients as well as the prevalence of other clinical conditions which occur in association with endemic goitre e.g deaf-mutism, cretinism hypothyroidism etc. Detailed information is acquired through

1) the examination of patients in the field (nearly 2000 patients have been examined) on a weekly basis as well as those referred to the Department in the Hospital.
2) water sample studies in the endemic and non-endemic goitre regions
3) evaluation of the information obtained through questionnairs (family history, nutrition including type of vegetable diet domestic water source etc) and
4) analysis of blood samples collected from normal subjects and patients with endemic goitre in the laboratory.

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2. Differential Lipid and Serum Protein Studies in Normal Subjects and Patients with Endemic Goitre in Plateau State, Nigeria
   - this aspect of the work will include in addition to the above studies a study of the immunopathology of endemic goitre and the variations which occur in plasma free and bound hormones as well as reverse T_3 in the endemic region (if facilities are provided by JICA for these investigations).

3. A Study of An 'Endemic Goitre Family' in Barkin Ladi
   - this is a case report of a family with four cretins: the patients who were discovered during the course of our studies were referred to the Department from Barkin Ladi for clinical examination. After physical examination and confirmation of the diagnosis with laboratory tests, they were referred to the Department of Medicine for further management. The report is being presented jointly by the Departments of Clinical Chemical Pathology and Medicine.

4. The Prevalence of Neonatal Hypothyroidism in Plateau State, Nigeri
   - this study is considered necessary as it does appear from the results of one preliminary studies that the incidence of cretinism in the region is high. This conculsion is drawn on our discovery of a family with four cretins during the course of our studies. The study will involve mass screening of all newborn infants and will continue into the 3rd phase (but can only be done if facilities are provided by JICA).

It is expected that seperate scientific papers would be published based on each sub-project within the next few months when adequate results have been collected.

Departmental Team: Isichei - Das - Towobola - Banwo - Egbuta (Towobola was relieved after some months from his assigment by Egbuta when he left the Department .

Prof. U.P. Isichei

PROPOSED FIELD SURVEY PLAN FOR THE SECOND PHASE OF THE INFANTILE DIARRHOEA PROJECT

This phase of the Infantile Diarrhoea project aims at using a systematic follow-up of the incidence of disease and infections spreading in humans (surveillance) to study the epidemiology and prevention of diarrhoeal disease in Plateau State, Nigeria.

Interdisciplinary epidemiological studies incorporating bacteriological and statistical methods, as well as the nutritional status and feeding habits of the population to be studied, are needed in the exploration of the problems related to diarrhoea and will determine endemic and non-endemic areas in the state. The microbiological laboratory findings in the form of isolation and identification of aetiological agents including their characterisation and serological study have been used in recognizing and analysing the case of the disease; and the epidemiological situation is now to be studied.

These studies should incorporate investigations for a wide variety of enteromicrobial organisms such as bacteria, parasites, viruses and a cursory look at the influence of such haemoparasites as malaria. A house to house study would be undertaken to examine the environment, water, food and animals in order to detect carriers, sources of infection and mode of transmission of pathogens.

LOGISTICS:

1 (a) A pilot epidemiological survey will be carried out on school children in some primary schools in Bassa Local Government Area. The list of schools will be made available later.

(b) The Sole Administrator for Bassa LGA, and subsequently the schools headmasters are to be approached for permission befield the field trips. A representative of the Department of Community Health is to accomplish this.

2. Sampling will commence from the first week until the second week of January 1986 (one week). The total number of samples to be collected will depend on the population of the schools.

3. From the second week of January until the second week of February 1986, the collected samples will be examined (one month).

4. The sample will consist of stool and blood only.

5. Stool samples will be examined for bacterial, parasites and(viruses); while blood films will be examined for malaria parasites.

6. For a period of one month (second week of February to second week of March) the survey will go beyond the school children into the villages.

7. Sampling of the school children will give an idea of the prevalence and geographical distribution of diarrhoea in the area, and will therefore, be used to know the village(s) from where children with the highest infectivity rate come.

8. At this time, three Japanese experts are expected namely a Paediatrician, a Microbiologist and an Epidemiologist.

9. Staffing for this aspect will consist of:-

a) Miss Agatha Ani
b) Mr. T. Takahashi
c) Mr. Godwin B. Kulori
d) Mrs. Hawa Umaru
} Bacteriology

e) Mr. M.O. Okoronkwo - Community Health
f) Mr. Ezekiel Y. Hware - Parasitology
g) Mr. Ucheda - Japanese parasitologist

10. A Toyota Landcruser van will convey the team to and from the schools.

11. Questionnaires will be designed in Japan, and some chemicals reagents and equipment will also be provided by JICA.

12. Sourvenires will consist of these:-

a) one soccer ball for each school
b) sweets for the pupils
c) A token gift for the headmaster (yet to be decided)

13. Village Survey:- The village(s) to be surveyed depend on the results of the pilot survey(see item 7).

14. The team for the Community field work will be composed of the following:-

a) Representative from Paediatrics
b) Representative from Community Health
c) 5th year medical students on Community Health Posting (about 10 in number).
d) Japanese experts (3, as in item 8 above)
e) Interpreters are to be taken from the Health Centre at Binchi.
f) Laboratory Staff for sample examination will consist of:-

Miss Agatta Ani
Mr. T. Takahashi
Mr. Godwin B. Kulori
Mrs. Hawa Umaru
} Bacteriology

Mr. Ucheda
Mr. Ezekiel Y. Hware
} Parasitology

Mr. M. O. Okoronkwo - Examination of drinking water samples for Coliforus and Most Probable Number (MPN).

15. Samples to be collected include stools, blood and drinking water. Stool will be examined for bactaria, parasites and rotavirus for children under five years old. Blood will be examined for unalasia parasites and drinking water for Coliforus and most probable number.

16. Since the size of the survey team has increased, two Toyota Landcruiser vans would be required.

17. Again the questionnaire (different from item 11 above) will be designed in Japan.

18. For effective epidemiological survey, a map of Bassa L.G.A. will be prepared. Mr. Okoronkwo and one Japanese epidemiologist will do this.

19. All data would be modified and analysed with the computer. Again Mr. T. Takahashi and Mr. Okoronkwo will do this.

20. Gifts will be issued as follows:-

a) Villagers with identified pathogens will be treated at the Health Centre where some drugge will be donated by JICA

b) Little children - Sweets

c) The village heads:- a token gift that will be decided later.

Proposed by Mr. M. Takahashi

Mr. M. O. Okoronkwo

30/9/85.

[illegible] MEETING HELD ON
THE 5TH OF OCTOBER 1985

RESEARCH PROPOSALS FOR 1986

The new proposals were considered in the light of the staff strength of the various departments involved. The Head of Microbiology Department complained about the staff strength of his department saying that the research has depleted the number of the departmental staff. Community Health Department is facing the same problem, although Prof. Usuoka will be joining them soon, on a one - year sabatical leave, and he may have an input to make towards the progress of the research. Dr. Takahashi also reported that Dr. Happa - a Paediatrician from Japan will be joining them to help work on the questionaires.

RESEARCH PLANS

Dr. Happa will work on the questionaires relating to clinical findings with Associate Prof. Z. Laszowski. The Head of Medical Microbiology Department was requested to meet the J.U.T.H. Authorities in order to make available the Records and facilitate the compilation of data from the Out-Patient Department (OPD), In-Patients and Child Health Clinic (CHC). The data will be collected by Dr. Happa and Assoc. Prof. Laszowski. Dr. Takahashi then informed the members that JICA has got a computer at Room 19 in Pharmacology Department. Assoc. Prof. Laszowski raised an objection with the proposal to discontinue the acceptance of specimens from JUTH. He was later cleared on this point.

PROPOSALS

(1) Primary survey for the first two months.
(2) This will be followed by visits to the families concerned where:
    (a) water survey
    (b) Goitre survey
    (c) Onchocerca volvulus infection and
    (d) The assessment of the level of hygiene will be undertaken.

Thus avending that the field survey should be a general survey

in which the primary work will be based on the findings of stool examination conducted followed up by the other aspects of survey.

Dr. Takahashi informed the members that by February 1987, some experts will be invited from other Nigerian Universities to consider the JICA/UNIJOS Research.

The submission of lists of equipment and reagents will be done on Monday the 14th of October 1985 and should consist mainly of expendables and spare parts for servicing the existing equipment.

PUBLICATIONS:

The Chairman reported on the plenary Meetings recent decision on funding of Publications. The J.I.C.A. will be funding the Publications of all work done under the JICA/UNIJOS Project and these Publications should be coded in sequence as JUJIP/01 etc. or UJ/JIP/01 etc. There has to be due acknowledgement to JICA and all publications should include all the active participants. In the event of any Publication, JICA will sponsor the production of two-hundred (200) copies; and this number may be increased in the case of multiple authors.

The meeting came to an end by 12.45 p.m. so as to enable a few of the members to welcome the State Governor on a visit to the Jos University Teaching Hospital.

R.A.C. Shonkan.
Chairman.

C. Ikeh
Recorder.

RAC/NO

UNIVERSITY OF JOS

DEPARTMENT OF ZOOLOGY

Phase IV Project Proposals for Studies by the Unijos - JICA Medical Entomology and Parasitology Group (1985/86).

In furtherance of the Research works for phase I, II and III, the following projects are listed for continuation into the phase IV period; i.e. 1985/86.

Project 1: "Studies On The Distribution Of Black-flies (Simulium spp) on Jos Plateau"

- Prof. M.O.E. Iwuala and Mr. M. Maduabum

Project 2: "Effect of Water Velocity On Black-fly Relative Abundance"

- Dr. D.M. Roberts and M.Sc. Student

Project 3: "Effect of Temperature and Relative Humidity On Pupal Survival of Black-flies"

- Dr. D.M. Roberts and Mr. D. Boakye

Project 4: "Distribution Of Immature Mosquitoes Associated With The River System In Jos Plateau"

Dr. R.J. Irving Bell and M.Sc. Student

Project 5: "Study Of Seasonal and Vertical Distribution Of Tree-hole Mosquito Breeding"

- Dr. R.J. Irving-Bell

Project 6: "Studies On The Prevalence and Distribution Of Onchocerciasis In Plateau State

- Dr. C.O.E. Onwuliri, Mr. E. Hweke and M.Sc. Student

Project 7: "Study of The Seasonal Abundance and Population Characteristics Of Immature Stages Of Black-flies In Jos Plateau Area"

- Prof. M.O.E. Iwuala and Mr. M. Nduaburn

Project 8: "Effect of Predators and Type Of Substrate On The Relative Abundance Of Immature Black-flies"

- Dr. D.M. Roberts and M.Sc. Student

Project 9: "Studies On The Dispersal Of Adult Black-flies"

- Dr. D.M. Roberts and Dr. R.J. Irving-Bell

Project 10: "Niche Distribution In Relation To Physiological Adult Population Of Black-flies And Mosquitoes"

- Dr. R.J. Irving-Bell, Dr. D.M. Roberts, and Dr. C.I. Akoh

Project 11: "Some Factors Influencing The Endemicity Of Onchocerciasis In The Jos Plateau, Nigeria"

- Dr. C.C.E. Chuluiri, Dr. I.A. [illegible] and Mr. B.E. Nwoke.

Project 12: "An Study of Age Composition of Mosquito populations of the Jos Plateau

- Dr. J.O.A. Onyeka, Prof. M.O.E. Iwuala and Mr. G.I. Anyawu.

Project 13: "Host feeding Preference and feeding patterns of Mosquitoes of the Jos Plateau

- Dr. J.O.A. Onyeka, Prof. M.O.E. Iwuala and Mr. G.I. Anyawu.

[illegible]

PROJECT 14: Cytotaxonomic analysis of the black flies, Similium damnosum complex from Jos Plateau Nigeria.

Investigator(s): Dr. John I. Akoh & Mr. E.B. Alo

Introduction:

Human Onchocerciasis is a serious debilitating disease of tropical Africa, Asia and America (WHO, UNDP/OCP/75.1, 1973).

In West Africa, this filarial parasite, Onchocerca volvulus is largely transmitted by black flies of the S. damnosum species complex (Crosskey 1969; Bull.Br. Mus. Nat. His. (Ent.) 14).

S. damnosum is a species complex with an intriguing biology and ecology. The epidemiological picture of Onchocerciasis is further complicated by the existence of distinct forest, guinea savanna and Sudan Savanna Simulium-Onchocerca complexes (WHO 1985, TDR/FIL-SWG(11)/85.4).

The first step towards an understanding of these complexes is the elucidation of the taxonomic status of the vector species complexes in relation to their vectorial capacity. Most taxonomic studies of the S. damnosum complex had focus mainly on adult morphology for field identification and larval cytogenetics for specific cytospecies analysis. (C.G, Vajime and R.W. Dunbar; Tropenmed. Parasit. 26, 1975). Adult Morphological taxonomy is very much inadequate, while larval cytotaxonomy cannot directly correlate the vectors with their vectorial status. An extensive adult cytotaxonomic analysis would probably provide a better insight into the problem of Simulium - Onchocerca complexes. The successful utilization of this approach in resolving the taxonomic status of the Anopheles gambiae species complex (Akoh, Ph.D Thesis, University of London; 1984); showed this method to be feasible.

Objectives: The aims of this project includes:-

(a) a detail analysis of Chromosomal polymorphism of O. volvulus recovered from patients on Jos Plateau.

(b) Correlation of histochemical variations with chromosomal variations of the some microfilariae.

Study Plan

(1) A comprehensive survey and collection of O. vovulus parasites from patient from various parts of Jos Plateau would be carried out during the early part of 1986.

(2) The parasites would be carried to an appropriate laboratory in Japan for a detailed cytogenetic analysis.

The author (Dr. J.I. Akoh) is therefore applying for funds from JICA to enable him undertake an intensive three months training/study of the methods for analysing O. volvulus cytogenetics in Japan during the summer of 1986.

Collaborators

(1) Prof. H. Takahasi; JICA, Jos.

(2) Dr. G.O. Ufomadu, NITR, Vom-Jos.

PROJECT 15: Cytogenetic analysis of Onchocerca volvulus Chromosomal Polymorphism.

Investigator(s): DR. John I. Akoh

Introduction:

Onchocerciasis, a serious debilitating disease of tropical Africa, Asia and Central America; is caused by the filarial parasite Onchocerca volvulus

Recent studies have revealed the composite nature of this parasite with up to 13 different histochemical variants on Jos Plateau (Ufomadu et al; (1985) In Press). Chromosomal analysis have shown that this parasite has the same conservative diploid chromosoma number of 2n = 8 as its central American strain (Hirai et al, (1985) In Press).

There is therefore the need for a detailed cytogenetic analysis of the chromosome complements of this human parasite. This would probably throw more light on the genetic basis of the histochemical variants and the Simulium - Onchocerca variations that have complicated the epidemiological picture of Onchocerciasis in West Africa. It would also provide data for a comparative study of this W. African strain with those from other parts of the world.

Objectives: This project is geared towards:-

(a) Larval cytotaxonomic evaluation of the S. damnosum complex from Jos Plateau.

(b) Evaluation of adult ovarian nurse cells, Malpighian tubules and other tissues for polytene chromosomes, and their cytotaxonomic importance.

(c) Correlating adult polytene chromosomes with those of the larvae, pin-pointing their cytotaxonomic correlates.

(d) Evaluation of adult cytotaxonomy in relation to the Simulium - Onchocerca complexes

(e) Cytogenetic analysis of S. damnosum chromosomal polymorphism in relation to the ecological and biological factors affecting Onchocerciasis control.

Importance: This project would definately throw more light on the Simulium - Onchocerca complex relationship, thereby putting man in a better position to plan a more effective Onchocerciasis Control Strategy.

Equipment:

1) Phase Contrast Microscope with automatic photographic component. (1)
2) Binocular insect dissecting microscope. (1)
3) Slides and slide covers . (1,000 each)
4) Refrigerator for storage of specimens. (1)
5) Chemicals:

(a) Glacial acetic acid (2.5 L.)

(b) Stock lactic acid (2. 5 L)

(c) Absolute alcohol 2.5 L

(d) Stock Propionic acid (2.5 L)

(e) Stock solution of aceto-lactic Orcein (500 ML)

(f) Orcein powder (5 bottles)

(g) Anaesthetic ether 500 MLS X 4

(h) Methylated spirit (stock). (2.5 L)

(i) Giemsa stain (2.5 L)

6) Specimen vials or containers

7) Whatman No. 1 filter papers

8) Dropping pipettes

9) Insect dissecting needles and forceps. (2 dissecting kits)

10) Vehicle for field sampling trips.

Collaborators; Dr. H. Takaoka, Oita Medical College.

Prof. H. Takahashi, JICA, Jos.

SUB PROJECT: TRACE ELEMENTS ANALYSIS

Chairman: Dr.I.MIZOGUCHI
Director:Dept.Environ. Hlth.
Tokyo Metropolitan Res. Lab.
of Public Health

RESEARCH PLAN FOR 1985/1986

The sub-project Trace Metals Analysis intends to put together and arrange the data already obtained by the end of 1985. The sub-project proposes following plan of researches during the period 1985/1986.

Main Reseach Project: Trace Elements in Surface Water of Jos Area.

Sub-items:

1) Evaluation of the trace element levels of city water supplies for Jos Metropolis.
2) Seasonal variation of the trace elements in surface water of Jos Area.
3) Heavy metal water pollution and its sources of Assob River,Jos, Nigeria.
4) Trace element levels of well and tap water of several Jos suburban areas.

The sub-project Trace Metal Analysis supposes that the four sub-items above mentioned are able to be completed by the end of 1985. In order to complete these reseaches, Dr.Y,Tsuchiya is sent to Uni-Jos from 31 August to 30 September,1985.

5) Trace metal levels in vegetables and cereals yielded in Jos Area.
6) Trace metal levels in soil of Jos Area.
7) Trace metals in Minerals and sediments in Jos Area.

The Sub-Project proposes that these three sub-items have to be carried on by Uni-Jos counterparts from 1986. Dr. Tsuchiya will give several technical advices on these sub-items during his stay at Uni-Jos in this September.

Reports concerning to each sub-item are expected to be submitted to the international scientific journal "Water Research". Dr. Tsuchiya will ask Team Leader's(Dr.Takahashi's) and counterparts'(Uni-Jos Members') advices on authors of each report in Jos.

SUB-PROJECT: INFANTILE DIARRHOEA

Chairman: Prof. R. Nakaya
Department of Microbiology
Tokyo Medical and Dental
University School of
Medicine

RESEARCH PLAN FOR 1985/1986

The sub-project Infantile Diarrhoea proposes following plan of researches during the period 1985/1986 based on the discussion in the steering sub-committee held at JICA on 30th July, 1985.

Sub-items:

1) Clinical, etiological and epidemiological investigations of infantile diarrhoeal diseases in Jos.

(1) The clinical and etiological data so far accumulated will be analyzed from the epidemiological point of view. The following aspects are to be analyzed and summarized statistically by referring to the records on the "Questionnaire on Diarrhoea in Children": a) Age, sex, and place of residence; b) Clinical findings; c) Epidemiological findings; d) Laboratory findings (bacteria, viruses, and parasites) with respect to frequency of detection, seasonal variation and incidence in age group. These data should be analyzed individually by the places of examination of the patients under investigation (JUTH OPD, JUTH Paediatric Ward, JUTH Child Health Clinic, MCH Clinic, and other Hospitals). e) Serotyping, toxigenicity and antibiotic susceptibility of the bacterial isolates.

(2) To perform the analyses, it is required to utilize the informations from the medical records of outpatients, inpatients, and CHC. An operational team should be organized for transcribing the materials mentioned above.

(3) Mr. T. Takahashi will be in charge to the statistical analyses.

(4) Miss Agatha Ani will be in charge to the laboratory investigations on the clinical specimens coming from now on [see(5)] and the bacterial isolates not identified yet.

(5) Collection of clinical specimens from JUTH should be discontinued. Only the specimens of emergency or of special request will be considered to be processed under this research project.

2) Field survey on enteropathogenic organisms in a rural area of Plateau State (February-March, 1986).

(1) This is an independent sub-item of research from the sub-item 1).

(2) Some rural area in the vicinity of Jos metropolis will be set up to perform health examination survey during February to March, 1986. The survey will be carried out mainly at the primary schools and/or at the junior high schools of the area through questionnaire. If it is possible, a limited number of stool specimens for laboratory examination on enteropathogenic organisms will be collected which may consist of the control of the sub-item 1).

A detailed plan of this survery will be prepared by the Committee of University of Jos/JICA Research Project. Sufficient preparations for this survey should be made after consulting the advice of the visiting team of JICA in November, 1985. It is recommended to aboid an extravagant plan for microbiological investigation.

(3) Points for planning and performance of the field survey.

a) Selection of rural area.

b) Recording and collection of questionnaires.

c) The form of questionnaire should be designed to be in harmony with the section of the epidemiological data in the "Questionnaire on Diarrhoea in Children".

d) Period of the survey.

e) Does the survey include villages or colonies through school children?

(4) Expert members to participate.

Dr. H. Takahashi, Mr. T. Takahashi, Miss Agatha Ani, A Nigerian physician in Pediatrics.

Japanese experts to be dispatched during the period of the field survey; A Japanese physician in Pediatrics and Epidemiology, A bacteriologist, A Japanese physician in Infectious Diseases.

Following articles of the research will be prepared:

1) Survey on Parasitic, Bacterial, and Viral Enteric Pathogens Associated with Infentile Diarrhoea in Jos, Nigeria.

2) Survey on Parasitic, Bacterial, and Viral Enteric Pathogens among School Children in Rural Area of Plateau State of Nigeria.

Notes: The results of currently ongoing examinations on the stool samples from 4 schools children are considered as a control and the background of the sub-item 1) and also a preparatory step for the sub-item 2).

*飲料水調査

SUB PROJECT: MEDICAL ENTOMOLOGY

Chairman: Prof. R.Kano
President, Tokyo Medical
and Dental University

RESEARCH PLAN FOR 1985/1986

The sub-project Medical Entomology proposes following plan of researches during the period 1985/1986 based on the discussion in the steering sub-committee held at JICA on 30th July, 1985.

Main research item: STUDIES ON FILARIASIS AND ITS TRANSMISSION PARTICULARLY ONCHOCERCIASIS.

Sub-items:

1) A study on Simulium-Onchocerca complexes in Nigeria.
This sub-item includes investigations on geologic zone-specific transmission of the disease based on the cross-susceptibility test of blackfly vectors to Onchocerca volvulus. Field experiments will be performed at various areas ranging from the rain forest to savannah (Sudan and Guinea) of the country.

2) Studies on O.volvulus and the microfilariae.
Recent chromosomal analysis of O.volvulus from Plateau State clarified that the chromosomal number was, 2n=8, which was identical to that of Central America reported by us (Hirai et al.,1985). Detailed study is recommended to be performed particularly on the poly-morphism of chromosomes to compare the cytogenetic nature of the parasite between Africa and America.
Biometric and histochemical analysis of the microfilariae of O.volvulus should also be done from the comparative viewpoint of the parasites between Africa and America.

3) Clinical and immunological studies of the disease.
Our recent study clarified the immuno-diagnostic specificity of ELISA to detect O.volvulus-specific IgG. The roles of various immunoglobulin classes and cell-mediated hypersensitivity in onchocerciasis should be investigated.
From the comparative viewpoint, clinical manifestations with histological findings should be investigated in comparison with those of Central and South Americas. Because, although the disease is considered to have been transported from West Africa through slave trade to America, the clinical manifestations differ greatly depending on the countries. A multi-disciplinary survey is needed for this purpose.

In order to perform above mentioned research items, I suggest that following Japanese would be dispatched to Jos University during the period 1985/1986.

Expert name	Specialty	Supposed oeriod of stay
Dr.A.Uchida	parasitologist Associate Professor, Azabu University	Nov.,1985-Oct.,1986
Dr.H.Takaoka	entomologist/parasitologist Associate Professor, Oita Medical College	Apr.,1986-Jun.,1986
Dr.K.Shiwaku	parasitologist Associate Professor Aichi Medical University	Apr.,1986-Jun.,1986
Dr.H.Yamada	ophthalmologist Associate Professor, Fukushima Medical College	Apr.,1986-Jun.,1986

Remarks: Following papers are presently under preparation for pubpublishment, which are concerned in the sub-project Medical Entomology within the period,1985.

1. Chromosomes of Onchocerca volvulus from Nigeria.
   HIRAI, TADA, TAKAHASHI, NWOKE and UFOMADU
   (Z.Parasitenkunde)
2. A biometric study of Onchocerca volvulus microfilariae from Nigeria by the nuclear counting method.
   MIMORI, TADA, SHIWAKU, UFOMADU and NWOKE
   (Amer.J.Trop.Med.Hyg.)
3. Detection of Onchocerca volvulus-specific IgG antibodies in the inhabitants from Nigeria.
   TADA, KORENAGA, SHIWAKU, UFOMADU ~~and~~, NWOKE
   (Trans.Roy.Soc.Trop.Med.Hyg.)
   OGUNBA,
4. A survey on blackflies (Simuliidae) in Plateau state, Nigeria.
   KADOSAKA, SHIWAKU, KANEKO, ROBERTS, IWUALA and TAKAHASHI
   (J.Aichi Med.Univ.Assoc.)
5. A parasitological survey in Plateau state, Nigeria.
   SHIWAKU, TAKAHASHI, NWOKE, ONWULURI and UFOMADU
   (Japan.J.Trop.Med.Hyg.)
6. Epidemiological studies of human onchocerciasis in Plateau state, Nigeria.
   NWOKE, SHIWAKU, UFOMADU and TAKAHASHI
   (Tr.Roy.Soc.Trop.Med.Hyg.)

November 14, 1985

PUBLICATIONS EXPECTED BY THE PROJECT.

(before end of 1986)

1. Trace Elements Analysis:

SUB-PROJECT 1. Clinical Chemical Pathology

1) Plasma and tissue levels of important trace elements and the metallo-carrier proteins in apparently normal subjects in Plateau State. A.I. Banwo et al.

2) Plasma and tissue levels of important trace elements and the metallo-carrier proteins in Miners, other inhabitants of the mining districts and special problem areas (e.g. Kuru) of Plateau State. Egbuta et al.

2) The impact of seasonal changes on plasmla trace element levels . M.Sc. Postgraduate Students.

4) Blood and urine lead and zinc dterminations in the lead-zinc mining community of Zurak. Egbuta et al.

SUB-PROJECT 2: Geology and Mining

1) Rapid analysis of sulphide ores by Atomic Absorptions Spectrophotometry (AAS) and their economic, environmental and genetic significance. Ogezi, A.E. & Adiuku-Brown, M.E.

2) Geochemical and Hydrogeochemical studies of the mining areas of the Sabongida - Vom - Kura - Meipang area, Jos Plateau, and their environmental significance. Ogezi, A.E. , Adiuku-Brown, M.E.

3) Significance of trace element distribution in soils, vegetation, rocks sediments and waters in the land-zinc mining area of Zurak, S.E.Plateau State. Ogezi, A.E., Adiuku-Brown, M.E. & Ogunbajo, M.I.

SUB-PROJECT 3: Zoology

1) Distribution of trace elements in some surface waters. Ejike, C., Anadu, D., Chidobem, I.J. & Nkemdirim, E.C.

2) Trace elements levels in the water and sediment in the Old Mine Ponds and their relation to Pond Primary Productivity. Ejike, C., Eade, J.W. Anadu, D. & Chidobem, I.K.

3) Seasonal variations in trace elements contents of water, sediments and macroinvertebrates in two reservoirs in Jos Plateau.

4) Studies on the impart of water quality characteristrics, gradient and water velocity on survival and larval transition in Simulium. Ejike, C., Makpo, J.K. & Okayi, R.C.

SUB-PROJECT 4. Biochemistry

1) Trace elements content in water of Plateau State, Nigeria. Ubom, G. & Noda, C.

2) Comparative study of water quality in goitrous and non-goitrous areas of Plateau State. Ubom, G. & Noda, C.

3) Seasonal variation of cations and anions concentrations in water in Jos Metropolis and its suburbs. Ubom, G. & Noda, C.

4) A new method (combustion) determining microamounts of Iodide (Iodine in water/foods). Ubom, G. & Noda, C.

II. Goitre

1) The prevalence of endemic goitre in pre-adolescent and adolescent school-children in Plateau State, Nigeria. Tiwari, I.C., Okoronkwo, O, Das, S.C. & Isichei, U.P.

2) Endemic goitre in Plateau Stae, Nigeria. Isichei, U.P.,Das, S.C. & Banwo, A.I.

3) The chemical pathology of endemic goitre in Plateau State, Nigeria. Isichei, U.P., Das, S.C., Towobola, O. & Egbuta, J.

4) A comprehensive study of plasma lipid and lipoprotein profile of a goitrous population. Das, S.C. & Isichei, U.P.

5) Differential study of the protein constituents of plasma in endemic goitre and the evaluation of thyroid and lipid associated specific carrier proteins in relation to thyroxine and cholesterol metabolism. Isichei, U.P., Egbuta, J., Das, S.C. &. Ezeogu, V.

6) Determination and evaluation of plasma total cholesterol, HDL and LDL-cholesterol and the triglycerides as markers of coronary heart risk in patients with long standing history of endemic goitre. Isichei, U.P. and Das, S.C.

7) A study of an "Endemic Goitre Family" with four cretins in Barkin Ladi. Kirti, S., Isichei, U.P., Das, S.C. & Egbuta, J.

III. Infantile Diarrhoea

1) Aetiological studies of infantile diarrhoea diseases seen in Jos University Teaching Hospital, Jos, Nigeria. Ani, A., Takahashi, M., Saida, H., Kozak, W.H., Kumar, V., Shonekan, R.A.O. & Agbonlahor, D.E. (JUJIP No-01)

2) Isolation of Champylobacter jejuni in Jos. Ani, A., Takahashi, M. Kozak, W.H., Kumar, V. & Shonekan, R.A.O.

3) Drug susceptibility tests and minimum inhibitory concentrations of 88 strains of bacterial enteric pathogens. Ani, A. et al.

4) Viral, bacterial and parasitic pathogens associated with diarrhoea in children. Takahashi, M. et al

5) Enteropathogenic bacteria and parasites associated with diarrhoea in children. Takahashi, M. et al..

6) Survey on bacterial and viral enteric pathogens associated with diarrhoea in four primary schools in Jos. Takahashi, M. et al

7) Preliminary parasitological survey in the Jos Plateau, Nigeria. Shiwaku, K., Takahashi, H., Nwoke, E.B., Onwuliri, C.O.E. & Ufomadu, G.O. (JUJIP No-04)

8) Parasitological study on four school chiodren in Jos. K. Kaneko, et al.

IV Medical Entomology

1) Chromosomes of Onchocerca volvulus from Nigeria. Hirai, H., Tada, I., Takahashi, H., Nwoke, B.E.B. & Ufomadu, G.D. (JUJIP No-02)

2) A biometric study of Onchocerca volvulus microfilariae from Nigeria by the nuclear counting method. Mimori, T., Tada, I., Shiwaku, K., Ufomadu, G.D. & Nwoke, B.E.B. (JUJIP No.-03)

3) An application of ELISA for the immunodiagnosis of onchocerciasis in NIgeria. Tada, I., Korenaga, , Shiwaku, K., Ogumba, Ufomadu, Nwoke.

4) A survey on blackflies (Simuliidae) in Plateau State, Nigeria. Kadosaka, Shiwaku, Kaneko, Roberts, Iwuala and Takahashi.

5) A parasitological survey in Plateau State, Nigeria. Shiwaku, Takahashi, Nwoke, Onwuliri & Ufomadu.

6) Epidemiological studies of human onchocerciasis in Plateau State, NIgeria. Nwoke, Shiwaku, Ufomadu & Takahashi

7) Acid phosphatase variations in the microfilariae of Dipetalonema perstans and Loa loa from the Jos Plateau, Nigeria. Ufomadu, Ekejindu, Taka, Shiwaku, Nowke.