AFRICAN REGIONAL POSTGRADUATE PROGRAMME IN INSECT SCIENCE

THE AFRICAN REGIONAL POSTGRADUATE PROGRAMME IN INSECT SCIENCE (ARPPIS)

SUMMARY
INFORMATION OF ARPPIS
1983 - 1988

ARPPIS is a collaborative training programme between the International Centre of Insect Physiology and Ecology (ICIPE) Nairobi, Kenya, and African Universities.
THE AFRICAN REGIONAL POSTGRADUATE PROGRAMME IN INSECT SCIENCE (ARPPIS),

SUMMARY
INFORMATION OF ARPPIS
1983 - 1988
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MEMORANDUM OF AGREEMENT FOR THE PARTICIPATION OF THE UNIVERSITY OF ................. IN THE AFRICAN REGIONAL POSGRADUATE PROGRAMME IN INSECT SCIENCE (ARPPIS).
MEMORANDUM OF AGREEMENT FOR THE PARTICIPATION OF UNIVERSITY OF  
........................................................................................................................................
IN THE AFRICAN REGIONAL POSTGRADUATE PROGRAMME IN INSECT SCIENCE (ARPPIS).

In support of the philosophy and the underlying principles of the ARPPIS programme based at the International Centre of Insect Physiology and Ecology (ICIPE) in Nairobi, Kenya, and in accordance with the general terms of participation of African Universities agreed at the Bellagio Planning Conference in September 1981, the University of ........................................ hereby agrees to participate in the ARPPIS programme, as a collaborating University.

The specific terms for this collaboration would, among other general terms of the Bellagio Agreement include the following:

1. That the University of .......................................... would sponsor candidates to the ARPPIS programme.

2. That the University of .......................................... would register candidates for their degrees under the ARPPIS programme; that such candidates would register through the specified procedure of the University.

3. That, where applicable, an acceptable system of course equivalents be worked out between the University of ......................................... postgraduate taught courses and the ARPPIS courses for the purpose of transfer of credit units.

4. That selected staff from the University of ................................. would be appointed as Visiting Scientists to the ICIPE and to the ARPPIS programme; also that selected Scientific Staff from the ICIPE would be appointed to Honorary Academic positions in the University of ........................................ according to appointed procedures.
5. That a nominee of the Vice-Chancellor of the University of ......................... be appointed a Coordinator, to act as a focal point for the ARPPIS programme at the University; and that this nominee should be the same as the Vice-Chancellor's appointee to the Academic Board of the ARPPIS programme.

6. That the parties to this Agreement may, from time to time by mutual consent, amend, modify, add to or delete any sections, phrases or words in this Memorandum.

7. That this Memorandum of Agreement becomes effective immediately for its execution by the appointed officers of the University of ......................... and the ICIPE. It shall remain in force until either party serves a written notice on the other of its intent to terminate it; in that event, this Agreement shall stand terminated at the end of one year from the date of issue of such notice.

SIGNED

For the University of .........................

........................................
........................................
........................................

For the International Centre of Insect Physiology and Ecology (ICIFE)

........................................
........................................
........................................
ARPPIS PARTICIPATING UNIVERSITIES

Addis Ababa University
Anambra State University of Technology
Kenyatta University,
Makerere University
Moi University
University of Dar-es-Salaam
University of Ghana
University of Ibadan
University of Khartoum
University of Malawi
University of Sierra Leone
University of Zambia
University of Zimbabwe
Rivers State University of Science and Technology

Ethiopia
Nigeria
Kenya
Uganda
Kenya
Tanzania
Ghana
Nigeria
Sudan
Malawi
Sierra Leone
Zambia
Zimbabwe
Nigeria

The following Universities have entered into discussions, with the intention of joining ARPPIS:

University of Nairobi, Kenya
University of Yaounde, Cameroon
University of Ivory Coast, Ivory Coast
Sokoine University of Agriculture, Tanzania.
ANALYSIS OF ARPPIS STUDENTS, BY COUNTRY AND ATTACHMENT TO ICIPE RESEARCH PROGRAMMES AND UNITS

A) Since 1983 there have been 6 Ph.D. classes within the programme. The 50 students have come from 12 different countries.

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  8  8  7  8  9  10  50

B) The members of the 1983 to 1987 Ph.D. classes have been attached to the following ICIPE research programmes for their project work. Provisional attachments for the 1988 class are also shown.

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<td>Termite</td>
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</tbody>
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  8  8  7  8  9  10  50
C) The ARPPIS/Rivers State University of Science and Technology M.Phil. programme specializing in biological control began in 1985. The 10 students have come from 6 countries.

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<td>Uganda</td>
<td>-</td>
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## DETAILS OF ARPPIS STUDENTS BY HOME COUNTRY, REGISTERING UNIVERSITY AND ICIPE RESEARCH PROGRAMME:

### A) Ph.D. Classes

<table>
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<th>NAME OF STUDENT</th>
<th>HOME COUNTRY</th>
<th>UNIVERSITY</th>
<th>RESEARCH PROGRAMME</th>
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<tr>
<td><strong>1983 Class</strong></td>
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<tr>
<td>Mr. R. Bagine</td>
<td>Kenya</td>
<td>Makerere</td>
<td>Termite</td>
</tr>
<tr>
<td>Miss W.S. Forawi</td>
<td>Sudan</td>
<td>Khartoum</td>
<td>Medical Vectors</td>
</tr>
<tr>
<td>Mr. A.L. Ibrahim</td>
<td>Sudan</td>
<td>Khartoum</td>
<td>Ticks</td>
</tr>
<tr>
<td>Mr. S. Kyamanywa</td>
<td>Uganda</td>
<td>Makerere</td>
<td>Crop Pests</td>
</tr>
<tr>
<td>Mr. B.C. Njau</td>
<td>Tanzania</td>
<td>Dar-es-Salaam</td>
<td>Ticks</td>
</tr>
<tr>
<td>Mr. J.H.P. Nyeko</td>
<td>Uganda</td>
<td>Makerere</td>
<td>Tsetse</td>
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<tr>
<td>Mr. S.H. Okech</td>
<td>Kenya</td>
<td>Rivers State,</td>
<td>Crop Pests</td>
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<tr>
<td>Mr. J.B. Okeyo-Owuor</td>
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<td><strong>1984 Class</strong></td>
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<tr>
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<tr>
<td>NAME OF STUDENT</td>
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<tr>
<td>Miss G.O. Akpokodje*</td>
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<td>Ibadan</td>
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<td>Moi</td>
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<td>Mr. I. Abu Zinid*</td>
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<td>Mrs. B. Rapuoda</td>
<td>Medical Vectors</td>
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* Students sponsored through the Africa-wide Biological Control Programme.
B) M.Phil. Classes in entomology, specializing in Biological Control.

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<thead>
<tr>
<th>Name of Student</th>
<th>Home Country</th>
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<tr>
<td><strong>1985 Class</strong></td>
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<tr>
<td>Miss E. Nwofor</td>
<td>Nigeria</td>
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<td>Miss R. Bob-Manuel</td>
<td>Nigeria</td>
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<tr>
<td><strong>1986 Class</strong></td>
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<tr>
<td>Mr. P. Amifor</td>
<td>Nigeria</td>
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<tr>
<td>Mr. B. Odongo</td>
<td>Uganda</td>
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<tr>
<td>Mr. G. Ochiel</td>
<td>Kenya</td>
</tr>
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<td>Mr. K. Kambona</td>
<td>Kenya</td>
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<td><strong>1987 Class</strong></td>
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<tr>
<td>Mr. A.B. Fonti Kanu</td>
<td>Sierra Leone</td>
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<tr>
<td>Mr. S.I. Kamara</td>
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<tr>
<td>Mr. J. Mbapila</td>
<td>Tanzania</td>
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<tr>
<td>Miss A. Ngii-Song</td>
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All M.Phil. students are registered at Rivers State University of Science and Technology, Nigeria.
### STUDENT SUPERVISION:

#### ARPPIS CLASS  |  STUDENT  |  UNIVERSITY SUPERVISOR  |  ICIPE SUPERVISORS

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<td>Dr. Okech</td>
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<td></td>
<td>Okeyo-Owour</td>
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<td>Dr. Mutinga</td>
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<td>Adabie, D.</td>
<td>Prof. W.Z. Coker</td>
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<td>Bahana, J.</td>
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<td></td>
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<td>Prof. M. Magzoub</td>
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<td>Kantiki, L.</td>
<td>Dr. D. Munthali</td>
<td>Dr. Dransfield</td>
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<td>Latigo, M.</td>
<td>Prof. C. Baliddawa</td>
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<td></td>
<td>Maranga, C.</td>
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<td>Dr. Dransfield</td>
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<td>Nderitu, J.</td>
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<td>Njau, M.</td>
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### M.Phil. Classes

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<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Supervisor 1</th>
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<tr>
<td>1985</td>
<td>Bob- Manuel, R</td>
<td>Prof. R. Kumar</td>
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<td>Dr. Nyiira</td>
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<td>Amifor, P.</td>
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<td>Dr. Odindo</td>
<td>Dr. Brownbridge</td>
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**NOTES**

1. Supervisor's names in brackets, not ICIPE scientists
2. N.A. - supervisors not yet appointed
RESEARCH PROJECTS OF ARPPIS STUDENTS:

Termite Research

i) 1983 Class
   Mr. R. Bagine*
   Biosystematic studies of the termite genus *Odontotermes* with special reference to Kenya.

Medical Vectors

i) 1983 Class
   Miss W.S. Forawi*
   Studies on Leishmaniae of Lizards.

ii) 1985 Class
    Mr. I. Aniedu
    Ecology of malaria vectors in an irrigation project at Perkerra (Marigat) in Kenya.

    Mr. M. Basimike
    Studies on the factors affecting the distribution and abundance of sandflies (Diptera, Psychodidae) in the Marigat area, Baringo District.

(iii) 1987 Class
    Mr. H.M. Hassane
    The biochemical taxonomy of phlebotomine sandflies (Diptera: Psychodidae) in Kenya.

    Mrs. V. Nyambati
    Inter-relationships between Leishmania species: molecular karotype analysis.

Tsetse

i) 1983 Class
   Mr. J. Nyeko*
   The influence of mode of induction of transmission of *Trypanosoma congolense* on the stability and induction of resistance to Samorin.

ii) 1984 Class
    Mrs. U. Elneima
    Characterization of different strains of *Trypanosoma congolense* collected from the Lambwe Valley, Western Kenya and the Nkuruman area, Maasailand, Kenya.

    Miss D.A. Adabie*
    Pupal ecology and the role of predators and parasitoids in natural population regulation of *Glossina pallidipes* at Nguruman, Kenya.

iii) 1985 Class
    Mr. C. Kyorku
    Trapping studies on *Glossina longipennis* Cortie at Nkuruman, Kenya.

    Mrs. R. Sang
    In-vitro studies on the virus-like particles (VLPs) of the tsetse fly *Glossina pallidipes* (Austen) (Diptera, Glossinida).

    Mr. G. Tikubet
    The ecology of *Glossina* spp. and trypanosomiasis challenge in southwestern Ethiopia.
iv) 1986 Class

Mr. P.K. Muange

Factors affecting the pupal distribution and mortality in a natural population of Glossina pallidipes (Austen), at Nkuruman, Kenya.

v) 1987 Class

Mr. J.O. Davis-Cole

Some aspects of the Mating behaviour Glossina morsitans morsitans Westwood and G. pallidipes Austen.

1987 Class

Mr. M.I. Mwangelwa

The ecology and vectorial capacity of Glossina fuscipes fuscipes on Rusinga Island and along the shore of Lake Victoria.

Livestock Ticks

i) 1983 Class

Mr. A. Ibrahim*

Host relationships of the tick Amblyoma variegatum in cattle and rabbits.

Mr. B.C. Njau*

Studies on the resistance acquired by rabbits experimentally infested with Rhipicephalus evertsi.

ii) 1984 Class

Mr. C. Maranga

Resistance to tick infestation in the goat and its function in controlling Rhipicephalus appendiculatus populations in the field.

iii) 1985 Class

Mr. B. Wishitemi

Induction of artificial immunity in sheep to Rhipicephalus appendiculatus Neumann (1901).

iv) 1987 Class

Mr. S. Mbogo

Induction of resistance to ticks by the immunization of their hosts with commercially available moultting hormones, and other tick antigens.

1987 Class

Mrs. E. Mwangi

The ecology of non-parasitic stages of Rhipicephalus appendiculatus, and other ticks of livestock, and the role of predators, parasites, pathogens and climatic factors, in the regulation of natural populations.

1987 Class

Mr. H. Oranga

Stochastic modelling of the impact of tick infestation on cattle productivity under natural field conditions on Rusinga Island.

Crop Pests

i) 1983 Class

Mr. S. Kyamanywa*

Ecological factors governing insect pest populations in maize and cowpea crop mixture with special reference to the bean flower thrips Megalurothrips sjostedti.
Colonizing responses of *Maruca testulalis* to different cowpea cultivars in relation to their resistance or susceptibility.

Population ecology of the legume pod borer *Maruca testulalis* in relation to its natural enemies on cowpea in Western Kenya.

Responses of bean flies, *Ophiomyia phaseoli* and *O. spencerella* (Agromyzidae: Diptera) to susceptible and resistant common bean (*Phaseolus vulgaris*) varieties, including the mechanism of resistance.

The influence of some cultural practices and aphid natural enemies on the infestation of the common bean (*Phaseolus vulgaris*) by the bean aphid (*Aphis fabae*).

Studies on some aspects of the biology and feeding behavior of *Eldana saccharina* Walker (Lepidoptera: Pyralidae) on one maize and one sorghum cultivar.

Bioecological studies on *Dentichasmias busseolae* (Hymenoptera, Ichneumonidae) a parasitoid of graminaceous stem borers and its potential for biological control.

The biology and host-parasite relationships of an entomogenous nematode, *Panagrolaimus* sp.

Studies on the effect of intercropping sorghum and cowpea on the population patterns of the stem borer complex.

Orientation and feeding behaviour of phytoseiid predators of on cassava green spider mites (*Tetramychellus*).

Population dynamics of the cassava green spider mite *Mononychellus tanajoa* in relation to its natural enemies.

Studies on the orientation, feeding behaviour and development of the cassava green spider mite *Mononychellus* species (Tetranychidae: Acari).

Crop losses in maize caused by the maize stem borer *Busseola fusca* Fuller (Lepidoptera, Noctuidae) in the Rift Valley, Kenya.

The effect of intercropping resistant and susceptible cowpea cultivars with maize and time of planting on infestation and damage by the legume pod borer, *Maruca testulalis*. 
Mr. M. Njau  Endocrinology of development and reproduction in the maize stem borer, *Busseola fusca* Fuller (Lepidoptera: Noctuidae).

Miss E. Nwofor  The biology and behaviour of *Neoseilus idaeus* (Denmark and Muma) (Acarina: Phytoseiidae) reared on natural and artificial media.


(iii) **1987 Class**

Mr. T. Murega  Genetic incompatibilities among populations of the Cassava Green Mite complex, *Mononychellus* spp (Acarina: Tetranychidae) and their implications for the taxonomy of the mite.

Mr. J. Ogwang  The survival of Nosema sp. under field conditions and its effects on the reproductive potential of *Chilo partellus*.

Mr. P.N. Amifor  Predation efficiency of an aphidophagous concinellid on the cowpea aphid *Aphis craccivora*.

Mr. B.O. Odongo  *Hirsutella* sp (fungi imperfecti) as a biocontrol agent of Cassava Green Mite *Mononychellus tanajoa* and the Red Spider Mite, *Tetranychus utricae*.

Mr. K.O. Kambona  The biochemical evaluation of taxonomic status of the Cassava Green Spider Mite Complex, *Mononychellus* spp.

Mr. G.R.S. Ochiel  Biology and ecology of a local strain of *Trichogramma* sp. Westwood (Hymenoptera: Trichogrammatidae) and its potential for the biological control of stem borers in Kenya.

**Chemistry and Biochemistry**

i) **1985 Class**

Mr. B. Torto  The role of surface chemicals of different sorghum cultivars in determining oviposition and larval feeding responses of the stem borer *Chilo partellus*.

* Title of submitted thesis.
## STATUS OF STUDENTS FOLLOWING GRADUATION FROM ARPPIS

<table>
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<tr>
<th>NAME OF STUDENT</th>
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<tr>
<td><strong>1983 CLASS</strong></td>
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<tr>
<td>Mr. R.K. Bagine</td>
<td>January 1988</td>
<td>Entomologist, National Museum of Kenya</td>
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<tr>
<td>Miss W.S. Forawi</td>
<td>April 1987</td>
<td>Applied for lecturership, University of Khartoum</td>
</tr>
<tr>
<td>Mr. A.L. Ibrahim</td>
<td>April 1986</td>
<td>Postdoctoral Fellow, ICIPE; Head, Tick Control, Sudan</td>
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<tr>
<td>Mr. S. Kyamanywa</td>
<td>July 1987</td>
<td>Lecturer, Makerere University</td>
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<tr>
<td>Mr. B.C. Njau</td>
<td>March 1987</td>
<td>Postdoctoral Fellow, ILCA; returning to TALIRO, Tanzania</td>
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<tr>
<td>Mr. J.H.P. Nyeko</td>
<td></td>
<td>Research Officer, Tsetse Control Department, Ministry of Animal Industry and Fisheries, Uganda.</td>
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<tr>
<td>Mr. S.H. Okech</td>
<td>March 1987</td>
<td>Scientist, ICIPE</td>
</tr>
<tr>
<td>Mr. J. Okeyo-Owuor</td>
<td>-</td>
<td>Scientist, ICIPE</td>
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<td><strong>1984 CLASS</strong></td>
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<tr>
<td>Miss D.A. Adabie</td>
<td>-</td>
<td>Entomologist, Ghana Atomic Energy Commission</td>
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<td>Mrs. U.M. Elneima</td>
<td>-</td>
<td>Entomologist, Ministry of Livestock, Sudan</td>
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<tr>
<td>Mr. L. Kantiki</td>
<td>October 1987</td>
<td>Lecturer, University of Malawi</td>
</tr>
<tr>
<td>Mr. C. Maranga</td>
<td>-</td>
<td>Lecturer, Kenyatta University</td>
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<tr>
<td>Mr. J.H. Nderitu</td>
<td>-</td>
<td>Entomologist, Ministry of Agriculture, Kenya</td>
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<td>Mr. M. Ogenga-Latigo</td>
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<td>Mr. J.F. Omollo</td>
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<tr>
<td>Mr. G. Tikubet</td>
<td>-</td>
<td>Lecturer, Addis Ababa University</td>
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<td>Mr. B. Torto</td>
<td>-</td>
<td>Lecturer, University of Ghana</td>
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<td>Mr. I Aniedu</td>
<td>-</td>
<td>Lecturer, Anambra State University of Technology</td>
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<tr>
<td>Mr. C. Kyorku</td>
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<td>Lecturer, University of Ghana</td>
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<td>Mr. M. Basimike</td>
<td>-</td>
<td>Research Officer, Ministry of Higher Education, University and Scientific Research, Zaire.</td>
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<tr>
<td>Mrs. R. Sang</td>
<td>-</td>
<td>Research Officer, Virus Research Centre, Kenya.</td>
</tr>
<tr>
<td>Mr. B. Wishitemei</td>
<td>-</td>
<td>Lecturer, Egerton University, Kenya.</td>
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</table>
PUBLICATIONS BY ARPPIS STUDENTS, FROM RESEARCH UNDERTAKEN IN FULFILMENT OF DEGREE STUDIES:

Immunological responses and the role of the paralizing toxin in rabbits infested with *Rhipicephalus evertsi evertsi*

Njau, B.C., and Nyindo, M. (1987)
Detection of immune responses in rabbits infested with *Rhipicephalus appendiculatus* and *Rhipicephalus evertsi evertsi*

Njau, B.C., and Nyindo, M. (1987)
Humoral antibody responses of rabbits to *Rhipicephalus appendiculatus* infestation.
ARPPIS DONORS

1. ARPPIS Secretariat and Infrastructure.

- Arab Bank of Economic Development in Africa (BADEA)
- Australian Development Assistance Bureau (ADAB)
- Overseas Development Administration, U.K. (ODA)

2. Student Fellowships.

- European Economic Community (EEC)
- Ford Foundation
- German Academic Exchange Service (DAAD)
- International Fund for Agricultural Development (IFAD)
- International Livestock Centre for Africa (ILCA)
- United Nations Agency for International Development (USAID)
- Scientific Technical and Research Commission of the Organization of African Unity (OAU/STRC)
- Studies in the Region, Netherlands Government (SIR).

N.B. This list gives both past and present donors.
ARPPIS FELLOWSHIPS

A) Three-year fellowship for Ph.D. students

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<td>ii) cost of accommodation during coursework semester</td>
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<td>v) equipment</td>
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Total: 45,000
B) Two-year fellowship for M.Phil. students

a) International Travel.
   including travel from Nigeria to Kenya for research and from Kenya to Nigeria for defence of thesis 2,750

b) Medical Insurance 350

c) Rivers State University of Science and Technology
   i) fees 3,200
   ii) accommodation 160
   iii) submission and examination 200

d) Proportion of cost of ARPPIS course in biological control 1,600

e) Research costs
   i) research grant 2,500
   ii) equipment 3,000
   iii) field costs 1,600
   iv) preparation of proposal, reports and thesis 400

f) Living expenses
   i) Nigeria 2,500
   ii) Kenya 5,100

23,360
TEACHING AND RESEARCH EQUIPMENT AND MATERIALS:

Microscopes:
1. Leitz Dialux 22EB (two) including, phase contrast optics, tracing device and graticules and stage micrometer.
2. Leitz laborlux k. (one)
3. Wild M5A stereomicroscopes (six) including, drawing tubes (two)
4. Wild M3B stereomicroscope (four) including, drawing tube (one)
5. Wild M3Z stereomicroscope with discussion set (one)

Teaching Equipment
1. Casio and fx-350A fx-350 scientific calculators (twenty)
2. Dissecting equipment sets (twenty)
3. Insect nets (four), sweep nets (four)
4. Insect setting boards and pins
5. General laboratory glassware and equipment

Visual Aids Equipment and materials
1. Leitz Pradovit projector
2. Weyel Overhead projector
3. Minolta x300 SLR camera, vivitar 28-200mm lens, vivitar 283 flashgun.
4. Zenit EM SLR camera

Documentation and word processing
1. Wang and IBM professional computers and printers

Transport
1. Suzuki Jeep
TEACHING LIBRARY:

1. **Insect Taxonomy**

   Richards, O.W. and Davies R.G.
   Imm's outlines of entomology

   Richards, O.W. and Davies, R.G.
   Imm's general textbook of entomology,
   Volume 2. Classification and Biology.

   Jeffrey, C.
   Biological nomenclature

   Sneath, P.H.A. and Sokal, R.R.
   Numerical taxonomy: the principle and practice of numerical taxonomy.

   Gale, J.S.
   Population genetics
   Blackie, 1980.

   Ford, E.B.
   Ecological genetics.

   Insect phylogeny

   Ridley, M.
   Evolution and Classification: the reformation of cladism
   Longmans 1986.

   Legendre, L. and Legendre, P.
   Numerical ecology
   Elsevier 1986. (8 copies).

2. **Insect Functional Morphology**

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