



**IFAR 2008 Professional Development Program  
Completion Report  
[800 words]**

**Instructions:**

Please submit the completion report by email, using this form, through the sponsoring CGIAR Center to [ifar@ifar4dev.org](mailto:ifar@ifar4dev.org) within three months after the completion of the fellowship.

*Please check if Thalwitz Scholarship*

   **Yes**

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**Name of Applicant**

**Toualy Marie Noel Yeyeh**

**Sponsoring CGIAR Center**

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**I. Work Program goals achieved (maximum length: 200 words)**

A multiplex Protein-A Sandwich-Enzyme-linked Immunosorbent Assay (PAS-ELISA) using penicillinase-based detection system was developed for the simultaneous detection of three viruses, viz., *Yam mosaic virus* (YMV), *Cucumber mosaic virus* (CMV) and *Dioscorea alata* bacilliform virus (DaBV) that are widespread in West African yam belt. Initially, antibodies were verified on leaf and tuber samples following a conventional protocol. Of the 540 *D. alata* leaf samples tested, 43.95%, 1.92% and 7.96% samples tested positive to YMV, CMV and DaBV, respectively. Of the 20 tubers tested YMV and DBV were detected in all of them. For multiplex PAS-ELISA, YMV (1:2000v/v), CMV (1:3000v/v) and DBV (1:1000v/v) antibodies were mixed and used in Protein-A coated wells of ELISA plates, followed by the addition of antigen (sap extract) and then added the penicillinase conjugated rabbit immuno- $\gamma$ -globulin (IgG) whole molecule (1:1000v/v) prepared in this study. This has detected virus infection in yam tubers and leaves. However, high background reaction was observed in multiplex PAS-ELISA, compared to the conventional method. Apical portion of the tuber was found to be an appropriate tissue for virus detection. This work has facilitated development of a multiplex PCR, which is rapid and convenient for testing virus presence in yam tubers and suitable for application in ill equipped labs.

**II. Plans for follow-up (maximum length: 200 words)**

Further work will focus on reducing the background reaction by using different blocking reagents as well as testing different antibody dilutions. Multiplex PAS-ELISA is qualitative assay and indicates virus presence, but does not provide virus identity. For specific identification of virus conventional ELISA will be performed particularly for field collected samples and disease surveys. Attempts are being made to establish an ELISA system for yam tuber indexing in the Department of Plant Pathology, Université d'Abobo-Adjamé, Abidjan. Penicillinase-based detection system, which offers reading of results without the assistance of ELISA plate readers, is an impetus for this work. This test will be used for developing an indexing scheme for selecting healthy seed yams. ELISA assay will be demonstrated in the practical classes of graduate and post-graduate students. I am planning a PhD work to study the distribution of yam viruses in Côte d'Ivoire.

**III. Report budget utilization including whether budget was spent as planned (maximum length: 100 words)**

Budget was utilized more or less as proposed. Details listed below.

<b>Item</b>	<b>Proposed in grant application (US\$)</b>	<b>Budget spent (US\$)</b>
Applicant	4,000	4,253
Operational costs	2,700	2,893
Technical support	500	191
Travel	2,250	2,265
Miscellaneous (4-books and literature printing)	1,000	996
Administrative costs	550	550
<b>Total</b>	<b>11,000</b>	<b>11,148</b>

**IV. Assessment of the fellowship experience and general comments. (maximum length: 300 words)**

This is my first overseas experience and working in IITA is like a dream come true. I experienced a number of techniques and learned different ways to approach a problem, and design and perform an experiment. I learned several new techniques such as ELISA, Polymerase Chain Reaction (PCR), immuno-capture PCR, bioassay, isolation of DNA and RNA, electrophoresis, and assessing plants for virus symptoms. I also learned about the advantages of simple and low-cost techniques. It is possible for me to establish penicillinase ELISA technique in my laboratory. I can also conduct demonstrations and train other colleagues and students. Although I learned several molecular biology procedures, facilities are limited in my University to continue this work. Colleagues in Virology Unit has extended good support and also contributed to the development of my spoken English skills.

The fellowship is a very good one for short-term activities. The tenure of this fellowship should be extended and even to cover PhD study. It is necessary to maximize the learning process through this grant. At the same time, I acknowledge that even this short term fellowship has greatly enhanced my ability and confidence. I grateful acknowledge IFAR and IITA for this gain.