



**IFAR 2004 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 within two months after the completion of the fellowship.

Please check if Thalwitz Scholarship

Yes

Name of Applicant (Ms) --Helga Rodriguez von Platen-----

Sponsoring CGIAR Center INIBAP/IPGRI Las Americas

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

This study has produced an effective method to identify and, therefore, distinguish very closely related *Musa* hybrids. We were able to differentiate full-sibs of FHIA-01 and FHIA-18 with ten microsatellites. We found that few primers can unmistakably identify FHIA-25, FHIA-21 (cousins), FHIA-20, FHIA-26, and FHIA-03, but we were unable to find an individual microsatellite that differentiated between FHIA-17 and FHIA-23 (full-sibs). We could not positively identify polymorphism between these two hybrids in spite of the polymorphism present in their parents. Therefore, this work is a contribution to the screening of the integrity of some of the FHIA *Musa* hybrids, while providing appropriate tools for plant tissue culture scientists and nursery professionals to eliminate the not true-to-type plants. Hence, a bar-coding can be developed for every hybrid. As such, the final beneficiaries of this technology will be farmers in Asia or Central America who will be given a guarantee for the material purchased.

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

For future short-term research based on the present results, we suggest a sequencing of the full set of PCR reactions kept at -80°C at the University of Kassel. We expect that these results will help to better understand the mechanism of polymorphism in *Musa*, to verify null alleles, to detect possible mutations in the primer sequences and to check for mutations (indels) in the tandem repeats. We suggest further studies to overcome the high genetic similarity between FHIA-17 and FHIA-23 with a technique called Representation Differential Analysis (RDA) to find differences in nearly identical and complex genomes such as *Musa*.

For medium-term research, the remaining SSR primers (unlabeled and fluorescently labeled primers) could be used to check the full collection of *Musa* mutant DNA at the University of Kassel and study the band pattern of these *Musa* mutants. The results could be used to write a proposal in cooperation with the Plant Breeding Unit at the joint

FAO/IAEA program where there is an established working program in bananas and plantains.

As member of the INIBAP/CATIE *Musa* working group, we are considering using these labeled and unlabeled sets of SSR primers to screen transgenic Currare plantains developed by the FONTAGRO project at CATIE in cooperation with CORBANA, University of Tolima, UNALMED-CIB and CINVESTAV. We would like to seek markers that could be associated with resistance/susceptibility in these plants.

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

The budget (US\$9,600) was spent as planned in the proposal, and covered all expenses estimated in reagents and materials. However, during the development of this research, it was necessary to have a higher level of resolution and precision in our results than the ones we could acquire at CATIE. To differentiate close relatives like the FHIA *Musa* hybrids (full-sibs), I took advantage of an invitation to the University of Kassel in Germany to run the microsatellites. I used my stipend to cover living expenses there. The results obtained have improved our level of understanding of how similar the genetic make-up of two hybrids could be. I brought very expensive and also very high-quality SSR primers (labeled and unlabeled) with me to share with other laboratories in Latin America. These SSRs can be used in many other studies and educational demonstrations for at least two more years.

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

This experience has provided both the perspective and technique to help a broad spectrum of users to maximize the guarantee the purchase of FHIA hybrids. The ultimate goal was to be able to differentiate between full-sibs hybrids, while positively identifying slight differences between similar genotypes. The study was successful in finding a set of microsatellites for each hybrid, with one exception. Therefore, this work is a contribution

to the screening of the integrity of some FHIA *Musa* hybrids while providing appropriate tools to plant tissue culture scientists and nursery professionals to eliminate the not true-to-type plants. Hence, a bar-coding can be developed for every hybrid. As such, the final beneficiaries of this technology will be Asian or Central American farmers.

I feel honored to have been selected to develop this analysis. I consider that this work helped me not only professionally, but also as person and farmer. I took the results of this research seriously to foster the links between science and technology. I worked diligently in this project to obtain the best results, and I envision in the near future my report will be used worldwide to bar-code many *Musa* hybrids with microchip technology.

I think that IFAR is supporting leaders in different fields of science that today make small but significant contributions to help agriculture to be a fertile ground for mankind. IFAR logo represents the multiplication of knowledge and this is exactly what I had experienced during the development of this project. I have brought new knowledge to colleagues and banana farmers; I have brought new materials to share with other laboratories in Latin America, I have brought the hope that these results can be used to develop new projects. Other people have offered me insights to a better understanding of the possible problems involved in bar-coding; other results have offered new ideas to continue with this project. In summary, everybody who was touched by this project has taken advantage of the knowledge developed and has foreseen the implications of the implementation of this technology. I would like to thank IFAR for providing and facilitating this rich academic environment to many professionals to do outstanding research.

Finally, I feel I needed more time to finish my final report. I suggest giving scholars one month to write and edit their final reports.

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